1999 WISCONSIN COMMERCIAL BUILDING CODE COMMENTARY

THIS BOOK CONTAINS THE CODE, AS OF JANUARY 1, 1999,
AND SUPPLEMENTARY COMMENTARY
FOR THE FOLLOWING CODE CHAPTERS:

CHS. Comm 50 - 64
CH. Comm 65 (DRAFT)
CH. Comm 66
CH. Comm 69
CH. Comm 70

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SBD-8325-P(R.01/99)

Forward

This commentary has been prepared by the staff of the Division of Safety and Buildings. It is intended to assist users of the Commercial Building Code (Chs. Comm 50-64, 65, 66, 69 & 70) in understanding the code's intent when applying it to the design and construction of buildings and structures. The Wisconsin Commercial Code is a performance oriented, minimum code; therefore, it allows a great deal of variation in design concepts. Thus the goal of this commentary is not to promote uniformity in design but to provide consistency in code application. The examples illustrated are intended as acceptable designs. They are not intended to be the **only** acceptable design.

A user-friendly code or commentary cannot be written to cover every situation encountered. Good sense and judgment, coupled with a reliance on the building official who has an awareness of the code's past history and intent, must be utilized when applying the code.

Special Notes: In this edition of the Commentary, we have also included the code revisions contained in the code change package that adopted new NFPA standards. These changes have been approved by the Legislature, but not adopted yet at the time of the printing of this Commentary. Their effective date is estimated to be March, 1999.

We have also included a draft of Ch. Comm 65, Construction Site Erosion Control as it existed at the time of publication. This is the draft of the rules submitted to the Legislature for approval as of November 1998. It is subject to possible change and its effective date has not been set. There are additional provisions in Ch. Comm 50 which are not reflected in this edition of the Commentary, due to the possibility of revisions. Consult the *Wisconsin Building Codes Report* **for updates.**

Also note that current copies of the codes are available by Internet connection at http://www.legis.state.wi.us/ rsb/code/. Additional program information is available at our agency website: http://www.commerce. state.wi.us/

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Telephone Contacts for Building Code Information

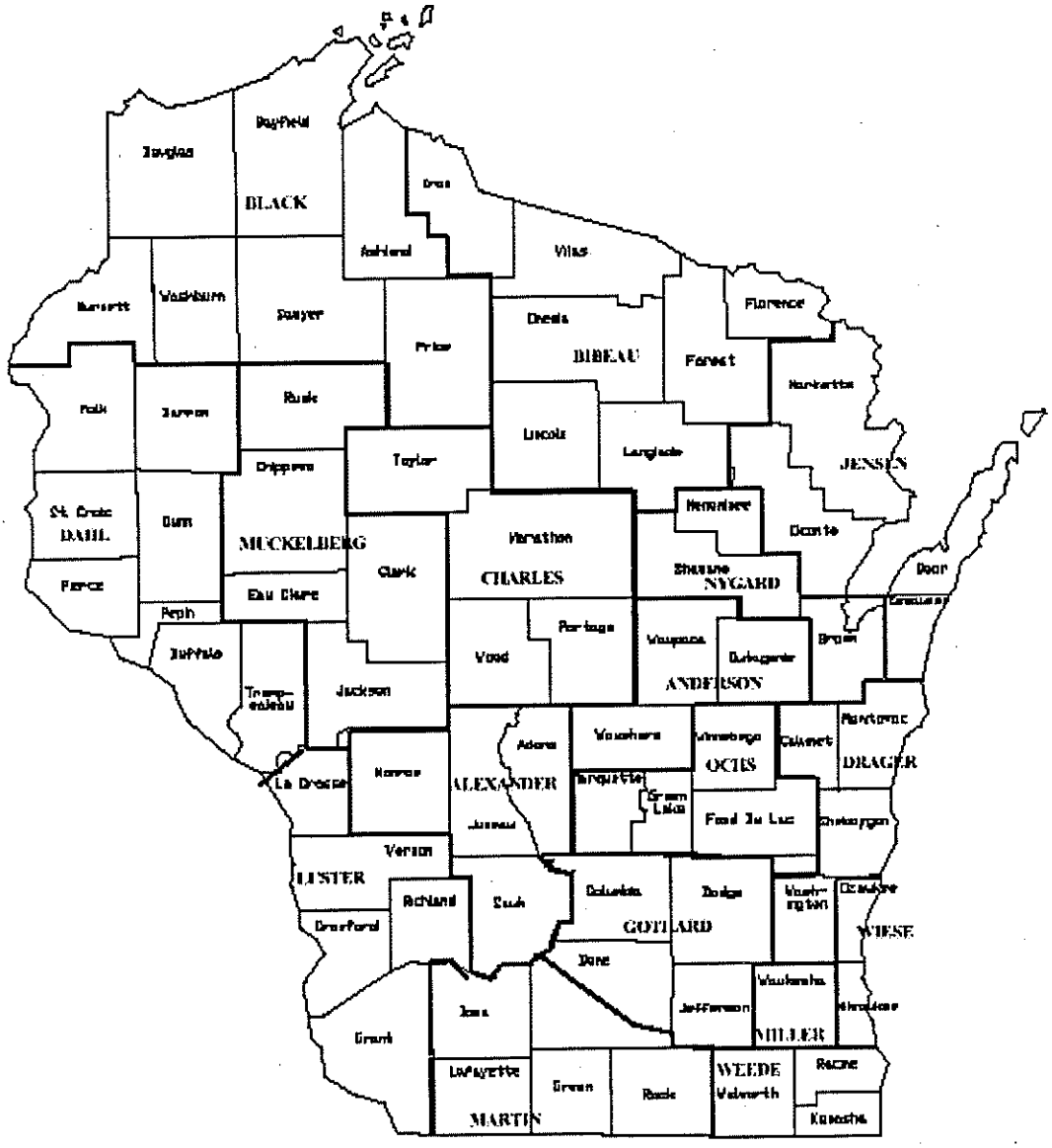
January 1999

Please note that if you already have conditional approval for a commercial building/HVAC project, the plan reviewer and/or inspector for the project are usually your best contacts for questions about that specific project. The names/phone numbers of both are printed on the letter of conditional approval (at the bottom, near the signature block). The inspector for the project will be indicated with a R-1, R-2, R-3 or R-4 before his or her name.
FOR ADDRESSES OF FULL SERVICE OFFICES AND INFORMATION ABOUT WHERE TO SUBMIT COMMERCIAL BUILDING OR HVAC PLANS, SEE PAGE iv.

Barrier Free Access			DonnaJean Stilen	(414)548-8609
BUILDING/HVAC PLAN APPOINTMENTS, STATUS CHECK, PRELIMINARY DESIGN APPOINTMENTS			call Full Service Office, except in Madison call Plan Entry Staff	(608)261-8490 or 261-8461
COMMERCIAL BUILDING CODE GENERAL QUESTIONS				
Hayward	Jack Miller	(715)634-8964	**FAX**	**(715)634-5150**
Green Bay	Don Diedrick	(920)524-3629	Syed Nizamuddin	(920)492-5609
	Jack Wotruba	(920)524-6850	**FAX**	**(920)492-5604**
LaCrosse	Jon Molzahn	(608)785-9334	**FAX**	**(608)785-9330**
Madison	Jon Buschke	(608)266-1921	Randy Dahmen	(608)266-3162
	Lynne LeCount	(608)267-2496	Dale Mitchell	(608)266-0669
	Rick Olson	(608)266-9291	Moktar Tamallah	(608)266-8737
	Mike Valdovinos	(608)267-2498	Joel Lentz	(608)267-2242
	Ellis Pifer	(608)266-0676	Ken Beseke	(608)261-8504
			FAX	**(608)267-9566**
Shawano	Steve Dobratz	(715)524-9019	Irene Gerloff	(715)524-6851
	Duane Peterson	(715)524-6852	**FAX**	**(715)524-3633**
Waukesha	Lee Finley	(414)548-8611	Sharon Blattner Held	(414)548-8611
	Henry Kosarzycki	(414)548-8615	Tariq Masood	(414)548-8608
	Donna Stilen	(414)548-8609	Larry Stilen	(414)548-8607
			FAX	**(414)548-8614**
Contractor & Inspector Credentialing				(608)261-8500
Electrical Code			Monte Ewing	(608)266-3064
HVAC CODE QUESTIONS			Randy Dahmen	(608)266-3162
			Rick Olson	(608)266-9291
Historic Buildings	Jon Molzahn	(608)785-9334	Duane Peterson	(715)524-6852
	Lynne Lecount	(608)267-2496	Jack Wotruba	(920)524-6850
Hospitals & Nursing Homes			Dept of Health & Family Services	(608)266-3878
Inspections				(608)266-8577
Lighting			Randy Dahmen	(608)266-3162
Manufactured Dwellings			Gary Ekes	(608)355-0108
Material Approval Application			Margaret Slusser	(608)261-6546
Mobile Homes (Manufactured Homes)				(608)266-8577
Official Codes Sales			State Document Sales	1-800-DOC-SALES
Other Building Code Publications			CSC	(608)267-4405
Petition for Variance Application			CSC	(608)266-3151
Preliminary Design Consultations call Full Service Office, except in Madison call Clyde Bryant				(608)266-1835
Training			Tom Kasper	(608)267-7586
Uniform Dwelling Code (1 & 2 Family Code)			Leroy Stublaski	(608)267-5113
Rental Weatherization Code				(608)267-2240
TDD				(608)264-8777

Internet - Most of the above staff can be reached with e-mail by addressing it to the first first letter of their first name followed by their last name, without spaces, and appending @commerce.state.wi.us. Example: Tom Kasper = "tkasper@commerce.state.wi.us".

Commercial Building Inspectors



Seee reverse side for addresses, phone numbers, etc.

The Department of Commerce is an equal opportunity service provider and employer. If you need assistance to access services or need material in an alternate format, please contact the department at 608-266-3151 or TTY 608-264-8777.

SBD-8879-P (R12/98)

Commercial Building Inspectors

Wisconsin Safety and Buildings Division

Sample email Address: Len Alexander = lalexander@commerce.state.wi.us

Name	Address	Telephone	FAX	Office Day
Len Alexander	PO Box 7302, Madison 53707	608-524-3374	608-267-0592	Fri
John R. Anderson	PO Box 7302, Madison 53707	715-823-2014	608-267-0592	Mon
David Bibeau	PO Box 7302, Madison 53707	715-627-7329	608-267-0592	Tue
Teresa Black	15837 Hwy 63, Hayward 54843	715-634-8114	715-634-5150	Fri
Nick Charles	2715 Post Rd, Stevens Point 54481	715-345-5336	715-345-5269	Tue
John Dahl	13 E Spruce St, Chippewa Falls 54729	715-232-6600	715-726-2549	Thur
Jane Drager	PO Box 64, Combined Locks 54113	920-788-4616	920-492-5604	Fri
Steve Gothard	PO Box 7302, Madison 53707	608-839-9835	608-267-0592	Mon
Emil Jensen	2331 San Luis Pl, # 150, Green Bay 54304	920-434-7240	920-492-5604	Wed
Chris Luster	PO Box 7302, Madison 53707	608-326-6779	608-267-0592	Thur
Char Martin	PO Box 7302, Madison 53707	608-884-4168	608-267-0592	Mon
Veronica Miller	401 Pilot Ct, Suite C, Waukesha 53188	414-521-5067	414-548-8614	Mon
Bill Muckelberg	13 E Spruce St, Chippewa Falls 54729	715-726-2541	715-726-2549	Fri
John Nygard	2331 San Luis Pl, # 150, Green Bay 54304	920-434-7192	920-492-5604	Mon
Peter Ochs	349 N Peters Ave, Fond du Lac 54935	920-929-3167	920-929-3924	Fri
Larry Weede	401 Pilot Ct, Suite C, Waukesha 53188	414-248-4922	414-548-8614	Fri
Betty Wiese	01 Pilot Ct, Suite C, Waukesha 53188	414-228-6956	414-548-8614	Mon

Call 608-266-2780 to schedule inspections for complaints, day care facilities, community-based residential facilities, child care institutions, and special inspection requests.,

Safety & Buildings Regional Offices And Certified Municipalities

January 1999

Regional State Offices

Plans for projects may be submitted to any of the following full service regional offices for review regardless of the location of the project. Once plans have been submitted to an office for review, all subsequent component plans (trusses, precast, HVAC, revisions, etc.) must be submitted to that same office. Please call the regional office at the indicated telephone number for further information.

GREEN BAY S&BD
2331 San Luis Place
Green Bay, WI 54304
920-492-5601
FAX: 920-492-5604

HAYWARD S&BD
15837 USH 63
Hayward, WI 54843
715-634-4870
FAX: 715-634-5150

LACROSSE S&BD
2226 Rose Street
La Crosse, WI 54603
608-785-9334
FAX: 608-785-9330

MADISON S&BD
201 W. Washington Ave.
P.O. Box 7162
Madison, WI 53707-7162
608-266-3151
FAX: 608-267-9566

SHAWANO S&BD
1340 Green Bay St
Shawano, WI 54166
715-524-3626
FAX: 715-524-3633

WAUKESHA S&BD
401 Pilot Court
Waukesha, WI 53188
414-548-8600
FAX: 414-548-8614

CERTIFIED MUNICIPALITIES

Per s. COMM/ILHR 50.21, the following municipalities have been certified to review plans for new buildings containing less than 5,000 sq. ft., total area; additions to existing buildings where the total area after construction of the addition is less than 5,000 sq.ft.; and alterations to existing buildings where the area of altered space is less than 10,000 sq.ft.. If your project is located within the limits of a listed municipality, and meets the size criteria, then contact the municipality involved. **Municipalities marked with an asterisk (*) have been authorized to review plans without limit on size of project or building.** Municipalities in [brackets] have been authorized to do inspections only, therefore submit plans to the state, using the reduced certified municipality fee schedule. For information regarding the current status of a municipality, call 608-267-7586.

COUNTIES

Eau Claire

CITIES & VILLAGES

Altoona
Antigo
Appleton
Augusta
Beloit
Berlin
Big Bend
Black River Falls
Brookfield
Burlington
[Cambridge]
Cedarburg
Cudahy
Delafield
Dousman
Dresser
Eau Claire
Elkhorn
Elm Grove
Fall Creek
Fitchburg
Fond du Lac
Fontana
Fort Atkinson
Franklin
Fredonia
Glendale
Grafton
Green Bay
Greenfield
Hartland
Hortonville
Howard
Janesville*
Jackson
Johnson Creek
Kaukauna
Kenosha
La Crosse
Lake Geneva
Lannon
Madison*
Marshfield
Mequon
Middleton
Milwaukee*
Monroe
Muskego
New Berlin
New Richmond
Oak Creek
Oconomowoc
Omro
Osceola
Oshkosh
Osseo
Paddock Lake
Plover
Port Edwards
Racine
Rhinelander
Ripon
Rochester
Seymour
Sheboygan
Silver Lake
Stevens Point
Sturgeon Bay
[Sturtevant]
Sun Prairie
Superior
Sussex
Twin Lakes
Walworth
Waterford
Waukesha
Waunakee
Waupun
Wausau
Wauwatosa
West Allis
West Bend
West Milwaukee
Weyauwega
Whitefish Bay
Wis. Rapids

TOWNS (County Location)

Berry (Dane)
Bloomfield (Walworth)
Bristol (Kenosha)
Cottage Grove (Dane)
Delavan (Walworth)
Farmington (Polk)
Geneva (Walworth)
Grand Chute (Outagamie)
Grand Rapids (Wood)
Hull (Portage)
LaGrange (Walworth)
Linn (Walworth)
[Lyons (Walworth)]
Mukwonago (Waukesha)
Norway (Racine)
[Oakland (Jefferson)]
Ottawa (Waukesha)
[Pleasant Springs (Dane)]
Plover (Portage)
[Rochester (Racine)]
Seymour (Eau Claire)
Sugar Creek (Walworth)
[Summit (Waukesha)]
Theresa (Dodge)
Waterford (Racine)
Waukesha (Waukesha)
Wheatland (Kenosha)
Windsor (Dane)

Wisconsin Division of Safety & Buildings

SUPPLEMENTARY BUILDING CODE RELATED PUBLICATIONS ORDER FORM

January 1999

These publications supplement the administrative codebooks. If you have questions regarding your order, contact Safety and Buildings Division, (608) 267-4405, TDD/VOICE RELAY: 1-800-947-3529. *Do not contact State Document Sales except for the official codes.*

(All prices subject to change on January 1 of each year. Use bottom of form to order.)

1. $32.00 - **1999 Wisconsin Commercial Building Code Commentary Chs. Comm 50-64, 65, 66, 69 & 70**-(Available 3-1-98.) Contains the code and related commentary as of **1-1-98** for all commercial buildings and 3 unit or more residential buildings. Includes Ch. Comm 69, Barrier-Free Design; Ch. Comm 66, Uniform Multifamily Dwelling Code; Ch. Comm 65, Construction Site Erosion Control; Ch. 70, Historic Buildings . Upkeep service of the commentary material only, **but not the code,** is through item #2 below. Use this commentary as a reference aid in addition to the official codes. (*The official codes are available from **State Document Sales**, P. O. Box 7840, Madison, WI 53707, Tel: (608) 266-3358.*)

2. $20.00 - **Building Codes Report Subscription** - This is a 12 month subscription to the monthly Wisconsin Building Codes Report. The Report includes official code interpretations, information on code changes, a summary of the petitions for variance that were decided, new certified municipalities and new material approvals, as well as other information of interest to designers and inspectors. Fire departments and currently credentialled building inspectors and fire sprinkler tradespeople receive free subscriptions.

3. Free - Limit of 25 copies - **Commercial Plan Review Brochure** - Easy to read summary of the commercial plan review process for building owners and others.

4. Free - **Commercial Plan Submittal Kit** - This includes the information and forms that designers need in order to submit commercial building and heating plans to the our department.

5. $10.00 **Commercial Building Energy Conservation/HVAC Code Handbook** - Contains applications and various field examples associated with the building envelope, lighting and HVAC sections of the commercial building code.

-Continued-

	TITLE	QUANTITY	PRICE	TOTAL
1.	1999 Commercial Building Code Commentary	_____	$32.00	_____
2.	Building Codes Report Subscription	_____	$20.00	_____
3.	Commercial Plan Review Brochure (25 max)	_____	Free	-0-
4.	Commercial Plan Submittal Kit	_____	Free	-0-
5.	Comml Building Energy Conservation Handbook - (Avail. 8-1-98).	_____	$10.00	_____
6.	1999 UDC Code Commentary	_____	$21.00	_____
7.	UDC Brochure (25 max)	_____	Free	-0-
	Additional copies 5¢ each-see note on reverse			
8.	UDC Energy Worksheet (One free copy)	_____	1 Free	-0-
	Additional copies 25¢ each-see note above	_____	$ .25	_____
9.	Erosion Control Brochure and Plot Plan (25 max)	_____	Free	-0-
10.	Rental Weatherization Commentary	_____	$ 5.00	_____
11.	Smoke Detector Brochure (25 max free)	_____	Free	-0-
	Additional copies 5¢ each-see note on reverse	_____	$ .05	_____
12.	Rental Weatherization Brochure (5 max free)	_____	Free	-0-
	Additional copies 5¢ each-see note on reverse	_____	.05	_____
	GRAND TOTAL Payable to **Safety and Buildings Division**			_____

-Over-

6. $ 21.00 **Uniform Dwelling Code (UDC) Commentary** - Contains the code and related commentary for the administrative, construction, HVAC and energy portions of the Uniform Dwelling Code (UDC), Chs. Comm 20-25, which applies to one- and two-family dwellings built since 1980. (The official UDC Code itself and annual upkeep service are available for $21.00, plus 5% state tax and any local sales tax, each from Document Sales-see address at item #l above.)

7. Free - Limit of 25 copies - **UDC Brochure** - Explains typical municipal inspection requirements for new homes. (Additional copies free by government letterhead request. Other quantity requests at 5¢ per copy.)

8. Single Free Copy - **UDC Energy Worksheet** - Must be submitted with one- and two-family plans to local building inspector.

9. Free - **Erosion Control Brochure and Plot Plan** - Basic information on controlling erosion on dwelling sites; includes handy plot plan form.

10. $ 5.00 - **Rental Weatherization Commentary** Explains the energy conservation requirements of the Rental Unit Energy Efficiency Standards, Ch. Comm 67 for residential rental properties when their ownership changes. Does **not** contain the code text. (Code available for $9.00, plus 5% state tax and any local sales tax, from Document Sales - see address at #1. Above.)

11. Free - Limit of 25 copies - **Wisconsin's Smoke Detector Law** - Explains smoke detector requirements for residential occupancies. (Additional copies free by government letterhead request. Other quantity requests at 5¢ per copy.)

12. Free - Limit of 5 copies - **Rental Weatherization Brochure** - Background and purpose of the law, when owners must comply, what buildings are covered including typical requirements and more.

DETACH, FILL OUT REVERSE SIDE AND ADDRESS INFORMATION BELOW, ENCLOSE CHECK WITH PROPER FEES, AND MAIL TO ADDRESS BELOW. The Division of Safety & Buildings does not discriminate on the basis of disability in the provisions of services. If you need this printed material interpreted or in a different form or if you need assistance in using this service please contact us.

Do not send official codebook orders to the Division of Safety & Buildings. Send those to State Document Sales.

MAIL TO:

DIVISION OF SAFETY & BUILDINGS
P. O. BOX 2509
MADISON, WI 53701-2509

Name:_____
Last or Business **First**

Street/Box #: _____

City: _____ **State:**_____ **Zip:**_____

Subscriber # from *WBCR* label: _____ **Daytime Phone #** _____

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Wisconsin Document Sales

BUILDING-RELATED ADMINISTRATIVE CODEBOOKS ORDER FORM

January 1999

(Listed prices do not include state or county sales taxes and are subject to change each January 1.)

The following codebooks are available from the **Document Sales Unit** for the indicated prices. All codes are 8-1/2"x11"size. If you desire to receive any supplemental codebook pages that may come out in the next twelve months, you must order the subscription upkeep service for an additional cost equal to the codebook price. Special double lock post binders for the codebooks are available below. DCOMM codes are progressively being prefixed with "Comm".

TO ORDER: Complete both sides of the order blank. Include either your Visa/Mastercard number with signature and expiration date, or a check or money order made out to Department of Administration. Orders by phone are accepted when purchasing with a credit card. **Local customers should call 264-9419 to place orders and long distance customers may call 1-800-362-7253. For general information, please call 608-266-3358. Do not call the Division of Safety & Buildings.**

1. $32.00 Wisconsin Building and Heating, Ventilating and Air Conditioning Code, Chs. Comm 50-64. (Commercial Building Code). Covers commercial buildings built since October 1914.

2. $10.00 Uniform Multi-Family Dwelling Code, Ch. Comm 66 Cover multi-family, non-transient housing.

3. $12.00 Barrier Free Design, Ch. Comm 69. Barrier-free requirements for non-residential commercial buildings.

4. $9.00 Existing Buildings Code, Chs. Comm 75-79. Covers all commercial buildings built prior to Oct. 1914.

DETACH

- Continued-

	STK #	ITEM	TITLE		QUANTITY	PRICE	TOTAL
1.	125	BU	COMMERCIAL BUILDING CODE Chs. Comm 50-64	Book	____	$32.00	____
				1 yr Upkeep	____	$32.00	____
2.	191	UM	UNIFORM MULTIFAMILY CODE Ch. Comm 66	Book	____	$10.00	____
				1 yr Upkeep	____	$10.00	____
3.	190	BF	BARRIER FREE DESIGN Ch. Comm 69	Book	____	$12.00	____
				1 yr Upkeep	____	$12.00	____
4	152	EZ	EXISTING BUILDINGS CODE Chs. Comm 75-79	Book	____	$ 9.00	____
				1 yr Upkeep	____	$ 9.00	____
5.	170	HB	HISTORIC BUILDING CODE Ch. Comm 70	Book	____	$ 9.00	____
				1 yr Upkeep	____	$ 9.00	____
6.	140	UD	UNIFORM DWELLING CODE Chs. Comm 20-25 and Appendix	Book	____	$21.00	____
				1 yr Upkeep	____	$21.00	____
7.	10	SD	SMOKE DETECTOR CODE Ch. Comm 28	Book	____	$ 9.00	____
				1 yr Upkeep	____	$ 9.00	____
8.	119	JM	WI ELECTRICAL CODE - VOL II Ch. Comm 16	Book	____	$ 9.00	____
				1 yr Upkeep	____	$ 9.00	____
9.	127	PL	WI UNIFORM PLUMBING CODE Chs. Comm 81-87	Book	____	$32.00	____
				1 yr Upkeep	____	$32.00	____
10.	204	CD	CREDENTIALS CODE Ch. Comm 5	Book	____	$ 9.00	____
				1 yr Upkeep	____	$ 9.00	____
11.	126	RU	RENTAL UNIT ENGY EFFIC STDS Ch. Comm 67	Book	____	$ 9.00	____
				1 yr Upkeep	____	$ 9.00	____
12.	201	--	8-1/2 x 11" CODE BINDER	-----	____	$ 8.00	____

Sub-total	____
5% State Sales Tax	____
(if applicable) 1/2% County Sales Tax	____
TOTAL AMOUNT DUE	____

Payable to: "DEPT. OF ADMINISTRATION"

- Over -

FOR OFFICE USE ONLY:			
CheckAuth # Record #	Initial	New Exp Date	

5. $9.00 Historic Building Code, Ch. Comm 70. Alternative building code for properly qualified historic buildings.

6. $21.00 Uniform Dwelling Code (UDC), Chs. Comm 20-25. Covers one- and two-family dwellings built since June 1, 1980.

7. $9.00 Smoke Detector Code, Ch. Comm 28. Requires dwellings built before the effective date (6-1-80) of the Uniform Dwelling Code to have smoke detectors.

8. $ 9.00 State Electrical Code, Volume II, Ch. Comm 16. Covers all buildings in the State. It adopts and amends the 1993 National Electrical Code (NEC). (The NEC may be available from commercial or vocational school bookstores or electrical supply houses; otherwise contact National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, Telephone: 800-344-3555.)

9. $32.00 Wisc. Uniform Plumbing Code, Chs. Comm 81-87. Covers all buildings in the state.

10. $ 9.00 Credentials, Ch. Comm 5. Covers the credentialling requirements for inspectors and contractors.

11. $ 9.00 Rental Unit Energy Efficiency Standards. Chs. Comm 67. Requires residential rental properties to meet minimum energy conservation standards when their ownership changes.

12. $8.00 Administrative Codebook Binder. Special double lock post binders for the 8-1/2"x11" codes.

DETACH

Detach, fill out reverse side and address information below, and mail to:

WISCONSIN DEPARTMENT OF ADMINISTRATION
DOCUMENT SALES UNIT
202 SOUTH THORNTON AVENUE
P. O. Box 7840
Madison, WI 53707-7840

(DO NOT SEND ORDER OR PAYMENT FOR THESE ITEMS TO SAFETY AND BUILDINGS DIVISION.)

Name: _____
Last or Business **First**

Street/Box #: _____

City: _____ **County:** _____

State: _____ **Zip:** _____

☐ Payment Enclosed
Check or money order only. Make payable to: Dept. of Adminstration

☐ MASTERCARD (16 digits)

☐ VISA (13 or 16 digits)

Credit Card No. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Expiration Date _ _/_ _

Daytime phone: ( ) _____ Signature _____

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Commercial Building Plan Review and Inspection - Basic Information

Some Basic Information

What Codes Apply?
The primary applicable code is the State Building and Heating, Ventilating and Air Conditioning Code, which is contained in Chs. Comm 50-64 of the state's Administrative Code. It is also known as the Commercial Building Code. Most of the information covered here is contained in Ch. Comm 50, which explains in greater detail how the Code is administered and enforced. Also applicable are the Uniform Multi-Family Code, Ch. Comm 66, for apartment buildings and the Barrier-Free Design code, Ch. Comm 69. Buildings originally built before 1914 that have not been changed are subject to the Existing Buildings Code, Chs. Comm 75-79.

What Is The Purpose Of These Codes?
These codes set minimum health, welfare and safety standards in terms of life safety, fire safety, accessibility, energy conservation, ventilation, heating, sanitary facilities, erosion control and structural soundness.

These codes are part of the state Administrative Code and have the effect of law. Changes usually are recommended by agency-appointed citizen code committees, endorsed by the agency, and given legislative review before they take effect.

To make sure the Code is followed, the state requires anyone constructing or remodeling most buildings to submit their building plans and heating, ventilating and air conditioning (HVAC) plans to the state for review and approval before any local permit issuance or construction begins. Subsequent on-site inspections are made to ensure the approved plans are followed.

What Kinds Of Construction Are Covered By The Codes?
All public buildings, multi-unit residences and places of employment are covered whenever built, added onto, altered, or when used for certain new purposes, as for example, a warehouse to apartment building conversion. Buildings must also be maintained to the code requirements in effect at the time of construction.

What's Not Covered By These Codes?
Farm buildings, buildings located on Indian reservations, federally-owned government buildings, and one- and two-family dwellings are exempted. (Newer dwelling construction is covered by the state's Uniform Dwelling Code. Chapters Comm 20-25, which is enforced locally.) Also exempted are home occupations, other than those involving explosives, fireworks or repair of motor vehicles, that use no more than 25% of the habitable area of a one- or two-family dwelling and have no more than one non-family employee. See Comm 50.04 for a complete list of exempted buildings.

Who Administers The Commercial Building Code?
The Wisconsin Safety and Buildings Division (S&BD) administers the Code, with a few exceptions. The cities of Milwaukee, Madison and Janesville conduct plan reviews and inspections of projects within their boundaries except for state projects. Some other municipalities also have been certified by the state to conduct plan reviews and inspections of new buildings of less than 5,000 square feet area, and alterations of less than 10,000 square feet. S&BD or your local building inspector can tell you what municipalities are certified. The Wisconsin Department of Health and Family Services at (608)266-3878 reviews hospitals and nursing homes.

Who Pays For Plan Reviews And Inspections?
The submitter of the required plans pays fees to the state for the cost of these activities. General taxpayer revenues are not used for this purpose.

What Is The Owner's Responsibility?
The owner is responsible for:

- Getting state approval and local permits.
- Hiring competent designers and contractors.
- Providing accurate information to the designer regarding the intended use of the building and any changes in use.
- Providing S&BD the name of a supervising professional to monitor the project.

When Must I Submit Construction Plans To S&BD For Review?
You must submit plans for all new construction, alterations, additions and changes-in-use, except for simple repairs or for offices, warehouses, mercantile buildings and storage garages of less than 25,000 cubic feet total volume. These projects still are covered by the Code, even though plans don't have to be submitted to the state. This plan review exemption does not apply to other occupancies such as repair garages, apartment buildings or theaters, churches or restaurants holding over 100 people. Heating equipment replacement only requires a letter and fee to S&BD.

When Must I Use A Registered Engineer, Architect Or Building Designer?
Wisconsin-registered design professionals must be used whenever the building exceeds 50,000 cubic feet, or the alteration or addition will increase the total volume of the building to over 50,000 cubic feet when completed. The design professional must sign and seal each plan page or an index page. Also, a registered on-site supervising professional must be retained from project start to completion and for the filing of a compliance statement. This may be the same person as the designer.

An out-of-state designer needs a Wisconsin registered design professional to certify the plans before they are submitted to the state for review and to be the on-site supervising professional.

How Do I Determine Building Volume?
The volume is based on the actual cubic space enclosed within the outer surfaces of the enclosing walls, and between the outer surfaces of the roof and the underside of the lowest floor. Attics, , basements, enclosed porches, garages, and vaults are included.

Who Has Records For My Existing Building That I Am Altering?
S&BD only keeps plan review files for 4 years. The State Historical Society (Tel. 608-264-6455) or the municipal building inspection department may have older records.

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What Happens To Plans When S&BD Gets Them?
Complete building and/or HVAC plan submittals are reviewed, in order of receipt or by appointment, by plan examiners. The plan examiners review the plans for completeness and compliance with the applicable codes. After review, the examiner informs the designer and owner whether the plans are conditionally approved, withheld or not approved.

- **Conditionally Approved** means that the plans substantially conform to the applicable codes, with the exceptions listed in the approval letter. S&BD will return all but one set of plans to the owner (or designer, if requested). Approval expires three years after the date of approval. In addition, local approvals are usually necessary. State statutes allow local governments to condemn a project on which no work has taken place for two years.
- **Withheld** means that the plans significantly conflict with the codes and must be corrected before S&BD will approve them. Changes, signed and sealed by the registered design professional if necessary, must be submitted to S&BD.
- **Returned Without Action** means that there are serious conflicts with the codes that will require the submittal of new plans if the project is to proceed.

How Fast Are Plans Reviewed?
Plans are reviewed within 15 business days. However, delays can occur when plan submittals are incomplete or incorrect.

What If I Am In A Hurry To Begin Construction?

It's possible for you to speed the plan review, or start construction before full plan approval (but after any state on-site sewage disposal or local permit approvals), in the following ways:

- **Plan Review By Appointment** provides for review at a future date, subject to the current workload, at no additional charge. This procedure may also be used to expedite review of withheld plans.
- **Permission to Start** allows for the construction of footings and foundations only, after a preliminary, cursory review of the building plans.
- **Footing and Foundation Approval** provides for approval when only the footings and foundations plans are submitted.

What If My Project Can't Comply With The Code Because Of Special Circumstances?
Please discuss this with S&BD staff as soon as possible through our Preliminary Review service. If code compliance cannot be achieved, the owner may request to substitute other measures designed to ensure equivalent compliance with the intent of that section. This is done through a Petition for Variance, for which a fee is required.

What If I Want To Use Alternative Materials?
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What If I Want To Preserve The Character Of A Historic Building Which I Am Remodeling?
An owner may elect to use the Historic Building Code, Ch. Comm 70, in the case of a registered historic building. The Code offers a number of design tradeoff options through a point system.

Are Other Plans Or Permits Required For A Project?
A building may be subject to state plan reviews of: the plumbing and private sewage systems under Chs. Comm 81-85; any elevators, lifts, dumbwaiters, speedwalks or escalators under Ch. Comm 18; and any tank storage of 5,000 gallons or more of flammable or combustible liquids under Ch. Comm 10. If you will be disturbing 5 acres or more of land, you must have erosion control and storm water management plans prepared and then file a Notice of Intent with S&BD. There is no state electrical or sprinkler plan review. Contact S&BD for individual submittal requirements

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After Plans Are Approved

How Do Inspections Work Once Construction Starts?
A state and/or local building inspector will make periodic inspections of the construction site to determine if the actual project is conforming to the approved plans, any conditions of approval, and the codes.

If shortcomings are found, they are reported on "Inspection Progress Reports" which are sent to the designer for resolution and reply. If there are outstanding deficiencies at the final inspection, then Building Inspection Report and Orders are sent to the owner. If these deficiencies are not corrected by a specified time, S&BD will pursue legal action.

Before building occupancy, the supervising professional must submit to S&BD and the municipality a Compliance Statement to verify that the building was built to the approved plans and the Code.

After occupancy, a local fire inspector will periodically inspect the building to ensure continued code compliance. Note, that in general, new codes are not retroactively applied to new buildings.

Who May Do The Construction Work?

The following construction work must be done by state-credentialled contractors: HVAC, fire sprinklers, plumbing, and structural welding. Local licensing requirements may also apply.

Submitting Plans

Plan Review By Appointment
We highly recommend this method of submitting plans. This provides for review at a future date, subject to the current workload, at no additional charge. This procedure may also be used to expedite review of withheld plans. **Plans must received by 2:00 PM two days before the scheduled review.**

What Needs To Be Submitted?
Completed Application Form SBD-118 which must be signed in original ink by the owner, designer and supervising professional, as required, to acknowledge that their respective responsibilities are understood. Including previous owners' names, previous S&BD building plan numbers and plan review schedule number will avoid unnecessary delays in the processing of your plan for review.

Minimum four sets of bound building/HVAC/lighting plans for review. Additional sets may be stamped at no additional fee if included with the initial review. Later "re-stamp" plans require a separate review appointment and a handling fee. Following are checklists to use in ensuring that adequate plans are submitted.

Four sets of structural component plans are required when submitted with the initial building plan review. After the initial building plan review has been completed, only one set of component plans is required. The exception is for pole building construction, where the truss plans must be included in quadruplicate in the bound set of building plans.

Appropriate fees - see following Application Form, SBD-118

Suggested Procedure for Designers Using the Wisconsin Building Code

(Chapters Comm 50-64, 66 & 69)

To facilitate basic code compliance, we recommend the following steps be taken by the designer:

1. Determine if project is within scope of code per ss. Comm 50.03 - 50.06. Review submittal requirements of Chapter Comm 50.

2. Determine applicable occupancy chapter of Chapters Comm 54-62 or 66. See following occupancy table or beginning of each occupancy chapter for descriptions.

3. Use either of these methods:

a. Variable Class of Construction Method: Based on desired area, height, fire department access, occupant capacity and sprinkler protection, determine minimum class of construction using occupancy chapter construction requirements. See following Occupancy Table for code references.

OR

b. Fixed Class of Construction Method: Based on desired class of construction (see following Class of Construction listing and s. Comm 51.03 for descriptions), select desired area, height, fire department access, occupant capacity and sprinkler protection combination from combinations allowed by occupancy chapter construction requirements. See following occupancy table for code references.

4. Design building components based on class of construction requirements of s. Comm 51.03 and general construction requirements of s. Comm 51.02.

5. Check specific requirements of applicable occupancy chapter and reference general chapters Comm 51-53 as needed.

6. Check other general requirements of chapters Comm 51, 52, 53 and 69:
- Materials, ss. Comm 51.047 - 51.14
- Occupancy Separations, s. Comm 51.08
- Exiting, ss. Comm 51.15 - 51.20
- Fire Systems, ss. Comm 52.01 - 52.013
- Windows and Fire Access, ss. Comm 52.02 - 52.03
- Accessibility per Ch. Comm 69 except for residential occupancies which must comply with subchapter II of Ch. 57
- Sanitary Facilities, ss. Comm 52.50 - 52.64
- Structural, Chapter Comm 53
- Thermal Performance, ss. Comm 63.10 - 63.12
- Lighting Power Limits, ss. Comm 63.40 - 63.53

7. Check the HVAC requirements of Chapter Comm 64 and equipment efficiency requirements of ss. Comm 63.20 - 63.42.

These steps will vary subject to individual occupancies and design criteria. For further information, consult the Building Code Commentary, available from the Division of Safety and Buildings.

OCCUPANCY CHAPTER TABLE

Chp. Comm	Description	Construction Requirements ss. Comm
54	Factories, Offices and Mercantile Occupancies	54.01
55	Assembly Halls - over 100 persons gathered for entertainment, recreation, worship or dining purposes	55.02, 55.03, 55.06
56	Schools and Museums	56.01, 56.02
57	Transient Residential Occupancies	57.02
58*	Health Care Facilities Detention and Correctional Facilities	58.01 58.42
59	Hazardous Occupancies - (storage and repair garages)	59.12
60	Child Day Care Facilities	60.30
61	Community-Based Residential Facilities and Sheltered Facilities for Battered Women	61.10
62	Specialty Occupancies - open parking structures, antennae, tents, outdoor theatres, assembly seating facilities, greenhouse, skywalks	Various
66	Multi-Family residential occupancies not of a transient nature and less than 60 feet in height	Subchapter II

* Note that due to Federal Life Safety requirements, Chapter 58 requirements and format differ greatly from the rest of the code. Hospitals and nursing homes are reviewed and inspected by the Department of Health and Family Services (608)266-3878.

Type	Class of Construction
1	Fire Resistive - Type A
2	Fire Resistive - Type B
3	Metal Frame - Protected
4	Heavy Timber
5A	Exterior Masonry - Protected
5B	Exterior Masonry - Unprotected
6	Metal Frame - Unprotected
7	Wood Frame - Protected
8	Wood Frame - Unprotected

See s. Comm 51.03 for class of construction requirements. Also note s.ILHR 51.02(22) which allows reductions in certain hourly rated construction in lieu of area and height increases.

PLAN SUBMITTAL CHECKLIST

What information do I need to include as part of my building plan submittal package?

See also Administrative Code Comm 54-62 and 66 for specific occupancy requirements relevant to the proposed use(s) of the building. ***Note: The commercial soil erosion requirements require the filing of a "Notice of Intent".*** *See Comm 50.115.*

FOOTING/FOUNDATION SUBMITTALS

A. Design Load Key Plan (Ensure thorough coordination of structural design before construction begins)

1. Live loads
2. Dead loads
3. Wind loads
4. Special loads (drifting, equipment, steeples, shear walls, etc.)
5. Indication of load transfer down to the foundation

B. Footing/Foundation Plans

1. Sizes and depths of footings
2. Anchor bolts, reinforcing
3. Perimeter insulation
4. Blasting permits
5. Thirty-day notice to neighbors (ILHR 53.26)

C. Site Plans

1. Distances to property lines, existing buildings, streets, etc.
2. Dimensioned streets or access roads
3. Pertinent recorded easements on adjoining property
4. Type of construction of existing buildings

D. Schematic Floor Plans, Elevations, Wall Sections

1. Exit stair locations
2. Fire walls
3. Window and fire department access openings

E. Calculations or Reference Tables

1. Itemized structural loads
2. Sample soil borings/footing foundation design

BUILDING SUBMITTAL *(new and addition)*

A. Footing/Foundation Plans
(See Footing/Foundation Submittals)

B. Site Plans (Plan size plus 81/2" x 11" file copy)
1. Distances to property lines, buildings, streets, etc.
2. Dimensioned streets or access roads
3. Pertinent recorded easements on adjoining property
4. Type of construction of existing buildings
5. Barrier-free parking and access paths
6. Court widths

C. Floor Plans
1. Uses and sizes of rooms
2. Exit location, width, lights, distance, distribution, doorswing, ramp and stair design
3. Automatic fire sprinkler requirements (ILHR 52.012 rooms, 52.013 uses, occupancy chapter, protected areas)
4. Fire rated division walls such as area, occupancy, class of construction, sprinkler limits
5. Window and door schedules (sizes, fire ratings, safety glaze, undercutting, etc.)
6. Sanitary facilities (number and location)
7. Stair and shaft enclosures
8. Isolation of hazards
9. Smoke detectors
10. Fire alarms, fire extinguishers
11. Barrier-free requirements
    a. Accessible routes from transportation to entrances
    b. Accessible parking design
    c. Accessible routes to other buildings, facilities and spaces on the site
    d. Accessible exits and routes from exits
    e. Interior accessible routes
    f. Means of vertical transportation (ramps, elevators, lifts) See following detailed checklist.
    g. Areas of rescue assistance
    h. Bathroom clearances (turn circle, door and fixture clearance, fixture heights)
12. Occupancy chapter requirements

D. Elevations/Sections
1. Grade, floor level, and roof elevations
2. Accessibility
3. Exterior openings
4. Egress details (fire escape, rescue platform, stairs)
5. Exterior finish

6. Depth of foundations
7. Wind bracing
8. Headroom

E. Structural Details

1. Framing plans (member sizes and space)
2. Bearing and connection details
3. Attic and roof access
4. Attic compartmentalization
5. Wall construction
6. Floor construction
7. Roof construction

F. Fire-Resistive Details

1. Design and listing of walls, ceilings, and roof systems (if required to be rated)
2. Complete section through the assembly
3. Firestopping and firesafing (Effective January 28, 1998 by emergency rule, protection of openings must comply with tested & listed firestop systems.)

G. Calculations

1. Building envelope thermal compliance calculations - (See Chs. 63 & 64 Worksheets. WI also accepts thermal performance calculations generated by the ComCheck EZ computer program. It is available by calling Pacific Northwest Labs at 1-800-270-2633 or for free download at http://www.energycodes.org.)
2. Sample structural
   a. Footing/foundation
   b. Floor/roof framing
   c. Post embedment for pole buildings
   d. Truss plans (NOTE: These may be submitted as a separate component, except for pole buildings)
   e. Exit width calculations for large buildings

H. Lighting Plans

1. Area controls Comm 63.50(1)
2. Lighting reduction controls Comm 63.50(2)
3. Daylight controls Comm 63.50(3)
   a. Windows
   b. Skylights
4. Shut-off controls Comm 63.50(4)
5. Display lighting controls Comm 63.50(5)
6. Exterior lighting controls Comm 63.50(6)
7. Hotel/Motel/Guest room Comm 63.50(7)
8. Device performance requirements Comm 63.51

9. Exterior lighting Comm 63.42
    a. Exterior lighting power allowance Comm 63.43
    b. Exterior lighting power used
10. Interior lighting
    a. Interior lighting power alliance.
        I. Complete building method Comm 63.47
        II. Area category method Comm 63.48
        III. Activity method Comm 63.49
    b. Lighting Control Credits (Optional) Comm 63.45(2)
    c. Interior lighting power used
11. Multiple interlocked systems Comm 63.45(1)
12. Track Lighting Comm 63.45(4)(a)
13. Incandescent sockets Comm 63.45(4)(b)
14. Exit signs Comm 63.52
15. Tandem wiring Comm 63.53

PERMISSION TO START

NOTE: This allows construction of footings and foundation only (after a preliminary, cursory review of building plans). The owner must review and sign the SB-118 form and be advised that the footings and foundation are NOT conditionally approved at this time (and the owner is proceeding at own risk—later correction of code deficiencies may be required).

A. SBD-118 application signed by owner, designer and supervising professional
B. Footing foundation component or complete building plans
C. Additional fees as listed on application

TENANT SPACE PLANS IN MULTIPLE TENANT BUILDINGS

A. Schematic Plan Indicating Existing Conditions

1. Complete building exiting plan showing all common exits and stairways
2. **All fire-resistive** walls
3. Location and number of public sanitary facilities
4. Location of project within the building

B. Pertinent Documents Such As

1. Variances
2. Condition of past plan approval that restrict this space or other spaces which affect or are affected by this space

C. Building Submittal Requirements

Note: Once the owner submits tenant alterations (e.g., for a new building "shell" to a particular Safety & Buildings plan review office or a certified municipality, (assuming all tenant spaces are under 100,000 cubic feet) all subsequent submittals must be made to the same office. It is possible to later designate a "new" review office, but this will require a letter from the owner and may be expected to result in some delays for the submitter.

ALTERATION SUBMITTALS

A. **NOTE:** In addition to the "general' and "occupancy" requirements shown on plans for the work being done, a SCHEMATIC of "existing" conditions pertinent to the work being done must be provided on the submitted plan set. ***Schematic Plan of Existing Conditions Includes***

1. Site plan information including property lines
2. Occupancy
3. Existing/new construction clearly identified
4. Number of stories and roof elevations
5. Class of construction
6. Fire-resistive wall locations/ratings
7. Sprinklered areas
8. Existing floor plans, etc.
9. Exit and stairway locations
10. Existing barrier-free features (entrances, toilet facilities, etc.)

Also include a summary of any previously approved petitions for variance.

HEATING AND VENTILATION SUBMITTALS

A. Floor Plan

1. Corresponds to approved building plans
2. Location and volume of exhaust, outdoor air and combustion air
3. Location of equipment, fire dampers
4. HVAC distribution and transfer

B. Elevation/Section Details

1. Insulation
2. Exhaust
3. Plenum material and location
4. Suspension of equipment, rated enclosures

C. Equipment Information - See Code Commentary section 50.12 re: equipment only replacement procedures. - Note: For equipment replacement, see s. Comm 50.12(2) Code Commentary for criteria and submittal procedure.

1. Manufacturer/model listed or tested
2. Input/output capacity
3. EER, COP, efficiency, economizer

D. Calculations

1. Transmission, infiltration and ventilation
2. Volume of exhaust, outdoor and combustion air

E. Occupancy or "Use" Ventilation Requirements

- Getting state approval and local permits.
- Hiring competent designers and contractors.
- Providing accurate information to the designer regarding the intended use of the building and any changes in use.
- Providing S&BD the name of a supervising professional to monitor the project.

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Appropriate fees - see following Application Form, SBD-118

AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG)

I. EXTERIOR CIRCULATION REQUIREMENTS

A. PARKING (IF PROVIDED)

1. Number of stalls [ADAAG 4.1.2 (5)]
2. Location [ADAAG 4.1.2 (5) and 4.6.2] Comm 69.245 and 69.17
3. Size [ADAAG 4.6.3 and 4.1.2 (5)]
4. Access aisles [ADAAG 4.6.3]
5. Signage [ADAAG 4.6, 4.30 and TRANS 200.07, Wis. Admin. Code] Comm 69.17 (2)

B. ACCESSIBLE ROUTE (EXTERIOR)
(Route to be indicated by schematic, shading, or labeling.)

1. From public right-of-way to building(s) [ADAAG 4.1.2 (1)]
2. From on-site parking and passenger loading zones to building(s) [ADAAG 4.1.2 (1), (5) and 4.6.6] Comm 69.245
3. From public transportation to building(s) [ADAAG 4.1.2 (2)]
4. Between buildings on the same property [ADAAG 4.1.2 (2)]
5. To other site facilities [ADAAG 4.1.2 (2)]
6. Route design
   a. Slope(s) [ADAAG 4.3.7] Comm 69.23 (2)
   b. Curb cuts [ADAAG 4.3.8] Comm 69.25
   c. Widths and lengths [ADAAG 4.3.3 and 4.3.8] Comm 69.25
   d. Handrails and guardrails, when required [ADAAG 4.7 and 4.8] Comm 69.25 (2) and 69.27 (2)
   e. Signage [ADAAG 4.1.2 (7) and 4.30]
   f. Platforms [ADAAG 4.7 and 4.8]
   g. Door swings [ADAAG 4.13] Comm 69.29
   h. Clear space [ADAAG 4.13.6]
   i. Surface finishes [ADAAG 4.3.6]
7. Ramps [ADAAG 4.8]
   a. Widths and lengths [ADAAG 4.8.2 and 4.8.3] Comm69.26 (1)
   b. Slope(s) [ADAAG 4.8.2]
   c. Handrails and guardrails [ADAAG 4.8.5] Comm69.26 (2)

II. INTERIOR CIRCULATION

A. ACCESSIBLE ROUTE (INTERIOR), HORIZONTAL CIRCULATION
(Route to be indicated by schematic, shading, or labeling.)

1. Ramps [ADAAG 4.8]
    a. Widths and lengths [ADAAG 4.8.2 and 4.8.3] Comm 69.18 (1m (a) 2.and 69.16
    b. Slope(s) [ADAAG 4.8.2]
    c. Handrails and guardrails [ADAAG 4.8.5] Comm 69.26 (2)
2. Corridors and passageways [ADAAG 4.3]
    a. Widths [ADAAG 4.3.3] Comm 69.22
    b. Turnaround [ADAAG 4.3.4]
3. Doors (maneuvering space, swing, size) [ADAAG 4.1.3 (7) and 4.13] Comm 69.29
4. Projections [ADAAG 4.1.2 (3), 4.1.3 (2), 4.1.6 (1) and 4.4] Comm 69.24
5. Public spaces [ADAAG 4.1.3 (5)] Comm 69.18, 69.19, 69.20 and 69.16
6. Service counters [ADAAG 7.2]

B. ACCESSIBLE ROUTE (INTERIOR), VERTICAL CIRCULATION

1. Elevator(s) (location, type, size) [ADAAG 4.1.3 (5), 4.1.6 (3) (c) and 4.10] Comm 69.18 and 69.275
2. Lift(s) (location, type, size) [ADAAG 4.1.3 (5), 4.1.6 (3) (c), 4.11 and ch. Comm 18]
3. Stairs [ADAAG 4.9]
    a. Rise and tread [ADAAG 4.9.2] Comm 51.16 and 69.27 (1)
    b. Width [ADAAG 4.3.3 and 4.3.11.3]
    c. Handrail and guardrails [ADAAG 4.9.4] Comm 69.27 (2)
    d. Number, identify [ADAAG 4.9.1]
    e. Area of rescue [ADAAG 4.1.3 (9) and 4.3.11] Comm 69.23 (3)
    f. Communication system [ADAAG 4.3.11.4]
4. Signage [ADAAG 4.3.11.5]

III. DETAIL ELEMENTS

A. TOILET FACILITIES

1. Entrance [ADAAG 4.22.2]
    a. Door size [ADAAG 4.13]
    b. Clear space to door [ADAAG 4.13]
2. Accessible fixtures [ADAAG 4.16 to 4.23]
    a. Number [ADAAG 4.1.3 (11)]
    b. Clear spaces [ADAAG 4.16.2, 4.18.3, 4.19.3, 4.20.2, 4.21.2, 4.22.3 and 4.23.3] Comm 69.18 (4 and 69.35
    c. Grab bars [ADAAG 4.16, 4.17.6, 4.20.4 and 4.21.4]
    d. Accessible height [ADAAG 4.16.3, 4.18.2 and 4.19.2]
3. Use of unisex [ADAAG 4.1.6 (3) (d) and 4.22]
4. Turning space [ADAAG 4.2 and 4.2.3]

5. Water closet compartment size [ADAAG 4.17.3] Comm 69.30
6. Pathway to compartment [ADAAG 4.3]

B. PUBLIC TELEPHONES (IF PROVIDED) [ADAAG 4.1.3 (17) and 4.31]

1. Number [ADAAG 4.1.3 (17) and 4.31]
2. Type (regular or text) [ADAAG 4.1.3 (17) and 4.31.9]
3. Clearances (floor or ground spaces) [ADAAG 4.31.2]
4. Mounting Height [ADAAG 4.31.3]
5. Equipment Specifications [ADAAG 4.31]
6. Signage [ADAAG 4.30.7]

C. DRINKING FOUNTAINS AND WATER COOLERS (IF PROVIDED) [ADAAG 4.15]

1. Number [ADAAG 4.1.3 (10) and 4.15.1]
2. Types [ADAAG 4.1.3 (10)]
3. Clearances, floor areas and mounting heights [ADAAG 4.15.2 to 4.15.5]
4. Equipment specifications [ADAAG 4.15]

D. SIGNAGE [ADAAG 4.30]

1. Where Required [ADAAG 4.1.2 (7) and 4.1.3 (16)]
   a. Parking [ADAAG 4.1.2 (7) (a), 4.6 and TRANS 200.07, Wis. Admin. Code] Comm 69.17 (2)
   b. Accessible Route [ADAAG 4.1.2 (7) and 4.30]
   c. Entrances [ADAAG 4.1.2 (7) (c) and 4.30]
   d. Permanent Rooms [ADAAG 4.1.2 (7), 4.1.3 (16) and 4.30]
   e. Toilet Rooms [ADAAG 4.1.2 (7) (d), 4.1.3 (16) (d)]
   f. Public Telephones [ADAAG 4.30.7]
   g. Special Occupancies [ADAAG 7.3, 10.2.1 (3), 10.4.1.(2) and 4.30]
   h. Areas of rescue [ADAAG 4.3.11.5]

E. CONTROL MECHANISMS [ADAAG 4.1.3 (13)]

1. Where required [ADAAG 4.1.3 (13]
2. Design
   a. Clear floor space [ADAAG 4.27.2]
   b. Height [ADAAG 4.27.3]
   c. Operation [ADAAG 4.27.4]

F. ALTERATIONS TO EXISTING BUILDINGS [ADAAG 4.1.6] Comm 69.20 & 69.03

1. Application of standards [ADAAG 4.1.6] Comm 69.20

2. Alterations to an Area Containing a Primary Function [ADAAG 4.1.6 (2)] Comm 69.20 and 69.10 (3)
3. Special Technical Provisions for Alterations to Existing Buildings and Facilities [ADAAG 4.1.6 (3)]
3. Historic [ADAAG 4.1.7] Comm 69.21

IV. OCCUPANCY REQUIREMENTS

A. GENERAL/NEW CONSTRUCTION [ADAAG 4.1.2 and 4.1.3] Comm 69.18

1. Number of accessible parking stalls [ADAAG 4.1.2 (5)]
2. When are elevators required [ADAAG 4.1.3 (5)] Comm 69.18 (2)
3. Number of accessible entrances and exits [ADAAG 4.1.3 (8)]
4. Areas of rescue [ADAAG 4.1.3 (9) and 4.3.11] Comm 69.23 (3)
5. Number of accessible drinking fountains [ADAAG 4.1.3 (10)]
6. Number of accessible toilet facilities [ADAAG 4.1.3 (11)]
7. Number of accessible public telephones [ADAAG 4.1.3 (17)]

B. ALTERATIONS TO EXISTING BUILDINGS [ADAAG 4.1.6] Comm 69.20

1. Application of standards [ADAAG 4.1.6] Comm 69.20
2. Alterations to an area containing a primary function [ADAAG 4.1.6 (2)] Comm 69.10 (3)
3. Special technical provisions for alterations to existing buildings and facilities [ADAAG 4.1.6 (3)] Comm 69.10 (3)

Elevator/Wheelchair Barrier Free Submittal Information Requirements

The following information for elevators, limited use elevators, or wheelchair lifts is required to be shown on the submitted plansets. The following explains in more detail the necessary information required on the building plan submittal. A separate submittal for compliance with Comm 18, Elevator Code, is also required. See the inside cover of this publication for contact information.

A. Elevator or limited-use elevator

1. Size of the elevator cab or limited-use cab.
2. Size, rating, and construction of the vertical shaft for the elevator or limited-use elevator
3. Door clearances to the elevator or limited-use elevator
4. Accessible route to the elevator or limited-use elevator
5. Maneuverability space at the elevator or limited-use elevator hoistway entrance doors

B. Vertical wheelchair lift

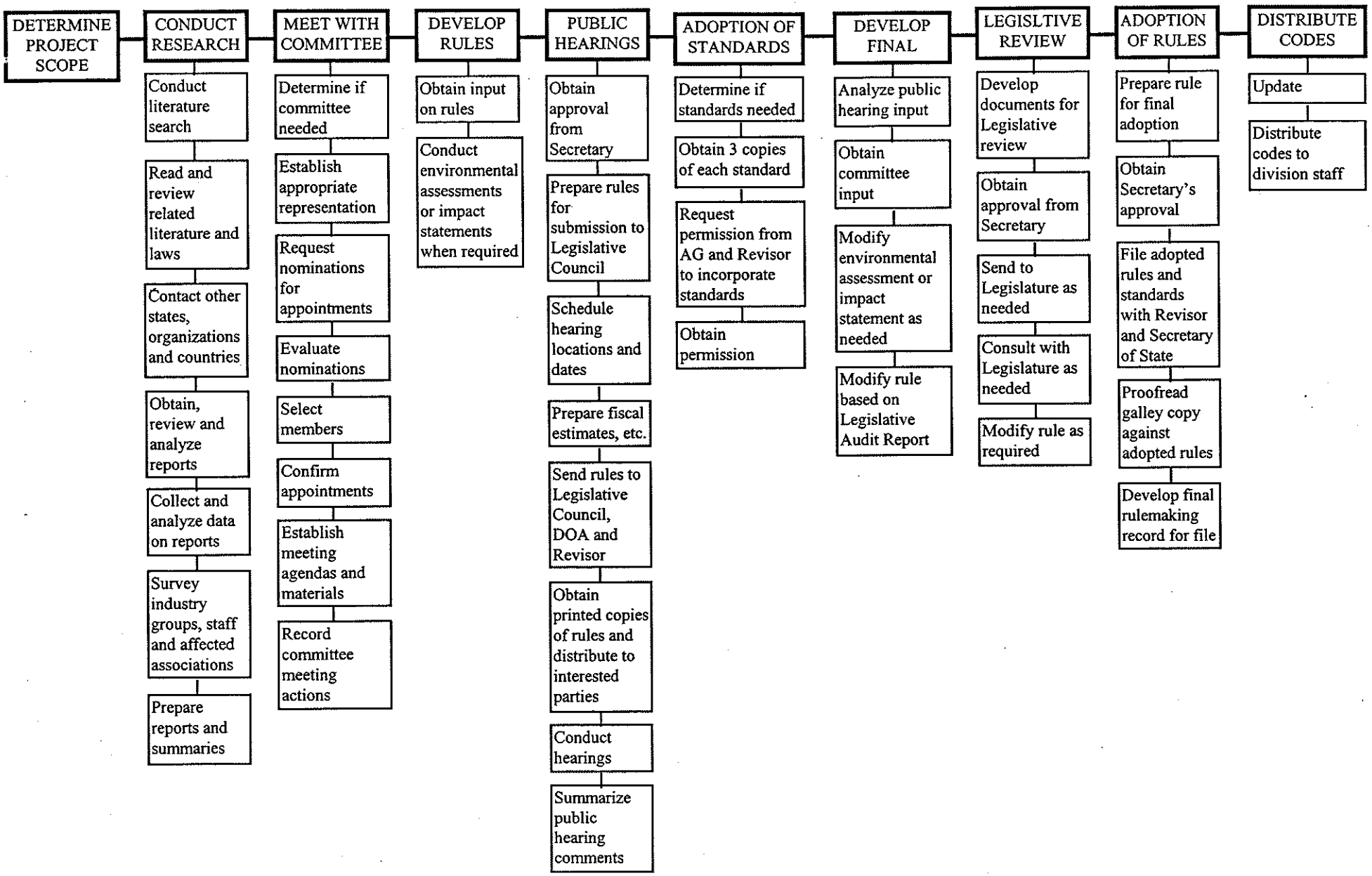
1. Size of the platform of the vertical shaft for wheelchair lift

2. Size and construction of the vertical wheelchair lift, where applicable
3. Door clearances to the vertical wheelchair lift
4. Accessible route to the wheelchair lift

C. Inclined wheelchair lift

1. Size of the platform of the inclined wheelchair lift
2. Number of occupants in the building
3. Location and width of all exits and stairways in the building
4. Accessible route to the inclined wheelchair lift
5. Width of the stairway where the inclined wheelchair lift will be installed and verification that the installation of the lift in operational position does not infringe into the required exit width

CODE DEVELOPMENT PROCESS



Code Development Use
Request No.: _____ - _____
(Code Ch.) (No.)

CODE CHANGE PROPOSAL

CODE SECTION NUMBER:

_____

SUBJECT MATTER:

_____

EXPLANATION OF PROBLEM:

SUGGESTED CORRECTION (Including Proposed Code Language):

JUSTIFICATION:

SUBMITTED BY: _____ DATE: _____

REVIEWED AND ENDORSED BY: _____ DATE: _____

REQUESTED IMPLEMENTATION METHOD FOR RULE CHANGE:

ß Process with changes for next scheduled edition of code.

ß Emergency

INTERIM ENFORCEMENT MECHANISM UNTIL RULE IS CODIFIED:

ß None

ß Written Interpretation

ß Other _____

SBD-7258(N.03/84)

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Commercial Building Code Committee

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Mr. Kerry L. Vondross S22 W30740 Boettcher Rd Waukesha, WI 53188	Manufacturers/Suppliers - Concrete Block	7/1/97

Commentary Format

This commentary has incorporated the code text; code Appendix; supplementary documents, such as Consistency Memos, Informational Notices, Official Code Interpretations; and past commentary text into one document for the code user's convenience. Generally the actual code appears first in regular text followed by commentary in *bordered italics*. The text of the code reflects that as of the beginning of the year. The official codes will govern in the event of any discrepancy. We recommend that you purchase the official codebooks and their upkeep services through State Document Sales (see order from in the front of this book).

Pages are numbered with the commentary edition year first, code chapter number next, and page number for that chapter last (for example: 1998-51-21). Note that the table of contents at the beginning of each chapter indicates the page that each code section begins on. Dictionary headings indicate the code sections that begin and end facing-pages.

The Division of Safety & Buildings is committed to providing uniform application of the code. In instances where the wording of the code unintentionally allows extreme differences in interpretation, the agency will issue a Consistency Memo or an Informational Notice, based on research and analysis, stating the intent of the code and the manner in which it should be uniformly applied.

Where major discrepancies appear in the code, an Official Code Interpretation will be issued to formally direct all users of the code to apply it in the same fashion. It is the intention to incorporate the Informational Notices and Official Code Interpretations into the code; however, due to varying code change cycles, these items usually appear in the *Code Commentary* while waiting formal adoption as codes.

Each edition of the *Code Commentary* compiles the previous year's code changes and supplementary documents. During the year, additional supplementary documents are issued through the *Wisconsin Building Codes Report* (*WBCR*) (see order form in the front of this book) to update the current year's edition of the *Code Commentary*. Therefore, it is necessary to purchase a new *Code Commentary* each year and to subscribe to the *WBCR* in order to stay current.

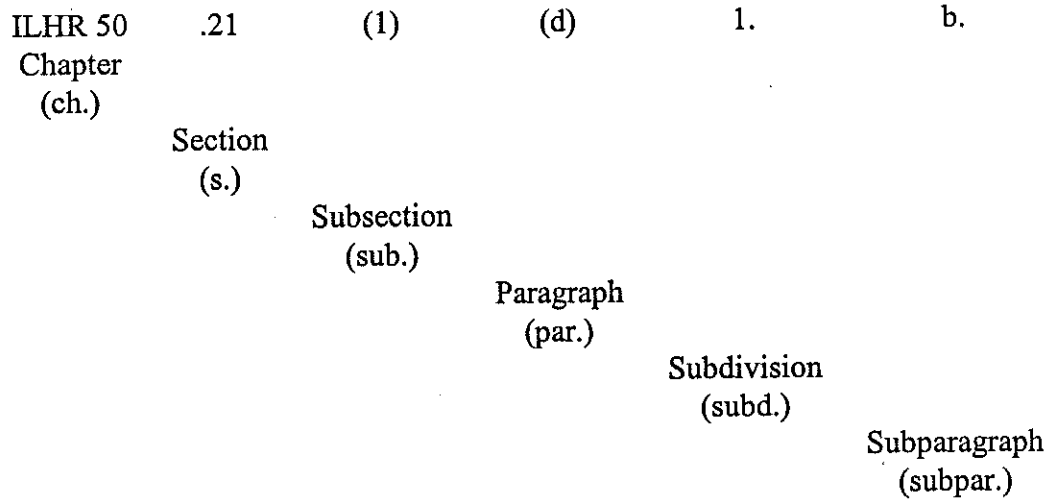
Recent changes to the Code Commentary are preceded a margin line.

To save space, the code history notes, showing past revisions to each code section, have not been reprinted in this **Code Commentary**. Refer to the official codebook for this information. Code revisions will be indicated by margin lines - vertical for changes, horizontal for deletions.

ADMINISTRATIVE CODE FORMAT

The Commercial Building Code, like other administrative codes, is divided into sections and sometimes subchapters. Subchapters are used to help organize the code, while the sections establish the specific requirements to be followed. Subchapters are for quick and easy reference and do not need to be cited in written references. The first digit of each section number corresponds to the subchapter it is in. Each subchapter and section has been given a title to indicate what is covered within the subchapter or section.

Each chapter of administrative rules is divided into sections, subsections, paragraphs, subdivisions, and subparagraphs. The sections are numbered according to the decimal system. Following is a figure illustrating the different parts of a rule. The abbreviations shown in the figure are used in the text of the rules when a reference is made. When you cite a specific part of a rule, the entire rule number and letter designation should be given so that the item can be readily referred to.



This can also be read as 50 point 21, paren 1, paren d, 1 period, b period and written as s. Comm 50.21(1)(d)1.b.. "Comm" refers to the Department of Commerce - the name of the state department that enforces this and similar codes. Some older codes administered by this department have an "ILHR" pefix which stood for the Department of Industry, Labor and Human Relations or "IND" prefix, which stood for Industrial Commission, our governmental predecessor.

A code reference that includes "(5m)" indicates that a new subdivision has been inserted into an existing series between (5) and (6). A code reference that includes "51.275" indicates that a new code section has been inserted into an existing series between 51.27 and 51.28 - in other words, the third code section number acts as a decimal place.

Multiple code section references are preceded by the abbreviation "ss".

The fine print notes following various code sections are not enforceable parts of the code, but rather are for informational purposes. This also applies to Appendix material. However, footnotes to code tables are part of the code and are enforceable.

Many code sections will begin with a general statement and then follow with one or more exceptions. Always check the exceptions. Also, many code sections will use special terms which are defined in special definitions sections, the major one being s. Comm 51.01.

Note that there is a table of contents at the beginning of the code and each chapter and an index at the end of the code.

In the official code, there is a register date at the bottom outside corner indicating the month of issuance for that page. There are also history notes at the end of each numbered code section that summarizes their revision history. Note that when new pages are issued, a revised code section will have a new bolded history note entry. Also be aware that when a full page-width table appears, it acts as a complete break in the dual-column text.

Chapter COMM 50

ADMINISTRATION AND ENFORCEMENT

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Subchapter I -- Purpose and Scope

COMM 50.01 PURPOSE OF CODE.

The purpose of this code is to protect the health, safety and welfare of the public and employes by establishing minimum standards for the design, construction, structural strength, quality of materials, adequate egress facilities, sanitary facilities, natural lighting, heating and ventilating, energy conservation, and fire safety for all public buildings and places of employment.

Note 1: The purpose as stated can be traced to the terms used in the "safe place" statutes, ch. 101, Stats.

Note 2: This code is intended for the protection of the public and is not intended as a design manual, a textbook or a construction manual.

Note 3: The code cannot address every conceivable design option; points of code application and clarification will be addressed and issued from time to time and will be published in the Wisconsin Building Codes Report available from the Safety and Buildings Division, P. O. Box 7969, Madison, Wisconsin 53707.

The code sets forth minimum standards and requirements, not necessarily desirable or optimum. For this reason, the code should not be used as a design manual as some of the code requirements may not provide the adequacy desired by the owner.

COMM 50.02 SCOPE OF CHAPTERS.

The provisions of chs. COMM 50-64 apply to all public buildings and places of employment, except those indicated in s. COMM 50.04. The provisions of these chapters are not retroactive unless specifically stated in the administrative rule. Where different sections of these chapters specify different requirements, the most restrictive requirement shall govern, except as specified in ss. COMM 51.02 (11)(b) 4., 52.012, 52.013, 58.001 (2)(c), 62.93 and 64.57 (4). No part of this code is intended to prohibit or discourage the design and construction of innovative buildings or the use of new materials or systems provided written approval from the department is obtained. Under this section, written approval from the department shall include, but is not limited to, an acceptance through preliminary design consultation, plan review, petition for variance, official code interpretation, material approval or other written forms of communication.

Unless a specific code section contains wording indicating that that code section is applied retroactively, none of the provisions of the code are retroactively applied. The codes that apply to an older building are those codes which were in effect at the time that the building took its present occupancy. If the building took its present occupancy prior to 1914, the provisions of Comm 75-78 will apply to that building. The codes applicable to a building are not necessarily those in effect when it was constructed as the building may have changed use during its lifetime.

RETROACTIVE CODE SECTIONS

COMM 50.03 Restroom parity when alteration or addition percentages are met.

COMM 51.047 (6)(a) Door-closing devices on smokeproof towers and interior enclosed stairways.

COMM 51.14 Safety glazing for replacement glazing.

COMM 51.15 (3) Exit door hardware requirements.

COMM 51.23(6)(a) Sprinkler maitenance

COMM 52.24 Recycling space when alteration or addition percentages are met.

COMM 56.03 (2) Smoke detection system or sprinklers required in basement.

COMM 57.16 Smoke detectors required.

COMM 57.165 Smoke detection system required in CBRFs.

COMM 57.17 Fire alarm system required.

COMM 61.26 Chapter 61 requirements apply retroactively.

COMM 62.52 Subchapter IV requirements for outdoor theaters apply retroactively.

COMM 63.001 (3)(b) Chapter 63 requirements apply to an existing building if a change of use, including an addition of a heating system, is made.

COMM 63.001 (3)(c) Chapter 63 requirements apply to replacements of heating and cooling systems and complete lighting systems.

COMM 57.79 Building accessibility when alteration or addition percentages are met.

Designers wishing to employ new, unique, or unusual designs and/or materials should contact the Division of Safety & Buildings early in the design process regarding acceptance of the proposal.

Note 1: For a definition of "public building" and "place of employment," see ss. COMM 51.01 (102b) and 51.01 (104a) or s. 101.01 (2), Stats.

The provisions of the code will apply to a building only if that building is a place of employment or a public building or both. Public building and place of employment are defined in COMM 51.01 as well as the statutes. Employees include full-time, part-time, and temporary employees. The owner of a business and the owner's immediate family are not considered employees for purposes of determining if a structure is a

place of employment. A public building is a commercial building wherein someone other than the owner may be present. This would include customers, patrons, sales personnel calling on the business, and tenants.

Note 2: Other state agencies and local municipalities may have adopted building or construction requirements that are either more restrictive or address other issues than those specified in this code.

Where separate administrative rules applicable to the building conflict, the more restrictive of the rules will apply. This holds true not only for conflicting sections of the building code, but also for conflicting administrative rules enforced by other sections, bureaus, and divisions. There are some exceptions to this general statement as indicated in this general section of the code.

Note 3: The overall enforcement responsibility for this code is equally shared by the building inspector and the fire inspector. Normally, the building inspector has primary responsibility during construction of the building, while the fire inspector has primary responsibility after the building is completed. The enforcement of many of the provisions of the code is the primary responsibility of the fire inspector, and compliance with these provisions should be of primary concern while conducting the fire prevention inspections mandated by s. 101.14, Stats. See Appendix B for a listing of the code sections for which the fire inspector has the primary enforcement responsibility.

The overall enforcement responsibility for this code is equally shared by the building inspector and the fire inspector. Normally, the building inspector has primary responsibility during construction of the building, while the fire inspector has primary responsibility after the building is completed. Typically while conducting the fire prevention inspections mandated by section 101.14, Stats., inspectors may share or shift those "during construction" responsibilities on issues relating to fire systems (alarm and detection, sprinklers, flammable and combustible liquids, fire extinguisher cabinet location, etc.)

(Items in the Appendix cited in above have been incorporated within the text of this commentary; therefore, no appendix may be found.)

Question 1: *A building is to be constructed for the purpose of storing and repairing two delivery trucks associated with a parcel delivery company operated by a husband, his wife, and their son. The administrative functions of the business are handled by a family member out of office space in their home. The delivery trucks are driven by and repaired by other family members. There are no other employees. Does this garage building fall under the scope of the Commercial Building Code?*

Answer: *No. There are no employees other than the owner's immediate family. Because the administrative offices are in another structure, salesmen and customers will not visit the garage building; therefore, it is not a public building so the building code does not apply.*

Question 2: *A building was constructed in 1921 as a warehouse. In 1958 it was converted to an apartment building. Which codes apply to the existing construction in this building?*

Answer: The 1958 code provisions will apply as that is the date of the change of use.

Question 3: *A building was constructed as a warehouse in 1921. The building was converted to an office building in 1958. Which codes apply to the existing construction of this building?*

Answer: *The 1921 codes will apply since conversion from a warehouse to an office occupancy is within the scope of the same occupancy chapter, COMM 54. However, the 1958 codes related to the increased occupant load, such as sanitary facilities and aggregate exit width, would apply.*

Question 4. *A manufacturing building over 3,000 square feet is proposed. A room within it will be used for the mixing of highly flammable liquids. COMM 51.08 requires that this hazardous room be separated from the balance of the building by 2-hour construction. COMM 10, the Flammable and Combustible Liquids Code, requires that the room be of 4-hour construction. Which code applies?*
Answer: *The more restrictive requirement of COMM 10 would apply in this case.*

Subchapter II -- Application of Building Code

COMM 50.03 APPLICATION.

(1) NEW BUILDINGS AND ADDITIONS. The provisions of this code shall apply to all new buildings and structures, and also to additions to existing buildings and structures, except those indicated in s. COMM 50.04.

An addition is new construction which increases the volume of an existing structure. Additions can be horizontal or vertical.

(2) ALTERATIONS TO BUILDINGS. The provisions of this code shall apply to all remodeling or alterations in any building or structure which affect the structural strength, fire hazard, exits, required natural lighting or replacement of major equipment. The provisions of this code shall apply to remodeling and alterations that effect efficiency as specified in s. COMM 63.001. These provisions do not apply to minor repairs necessary for the maintenance of any building or structure nor to buildings exempt, as listed in s. COMM 50.04.

Alteration is work within an existing building which does not increase the volume of the existing building.

Compliance with the code will be required in most cases since very little can be done in the form of alteration which will not affect the structural strength, fire hazard, exiting or natural lighting. Even new wall, floor and ceiling finishes are regulated by code, and affect fire hazard. Partition changes, either addition or removal, affect exiting.

Although the code provisions will always apply, it may not be necessary to obtain state approval for the work. If a minor alteration project is contemplated, the local code officials should be contacted to determine if that local official will require state approval of the project prior to issuance of a building permit.

(3) CHANGE OF USE.

(a) If the use of an existing building or structure is changed in accordance with the definition of s. COMM 51.01 (87), and the requirements for the new use are more stringent than those for the previous use, the building or structure shall be made to comply with the requirements for the new use as provided in this code.

1. Exception. Unless the requirements for the new use are modified subject to the written approval by the department.

2. Exception. An existing building undergoing a change of use shall comply with the accessibility requirements specified in s. COMM 69.03 (3).

COMM 57.79 (4) specifies that if the change in use is to covered multifamily housing and the building is remodeled or added to, the building shall comply with COMM 57 Subchapter II.

(b) If, upon inspection of an existing building or structure, it is found that its use has changed and that it does not comply with the requirements of the building code in effect at the time of change, it shall be made to comply with the code requirements in effect at the time of change in use.

Change of use is generally considered a change from one occupancy chapter to another, rather than a change within an occupancy chapter. If an existing building does change use, the building, in its entirety, must be brought into compliance with the current code requirements for the new use. Nothing is "grandfathered." The only exceptions to this requirement are the requirements for accessibility by the

handicapped. Also, if a building changes use within an occupancy chapter, only those code sections within that occupancy, affected by the change, need be met.

If only a portion of a building changes use, it becomes necessary to determine if the entire building must meet current code or only the portion changing use. The Department will base this determination on the amount of floor area of the building undergoing the change. If 50 percent or more of the total floor area changes use, the entire building will be considered as changed and the current code will apply to the entire building. If less than 50 percent changes use, the basic structure will be considered as unchanged and subject to the older code and only the changed portion would be required to meet the occupancy requirements of the new use.

Please see the commentary under COMM 50.02 for additional information regarding change of use and code application.

Question 1 *An existing warehouse is being converted to an apartment building. What codes must be followed?*

Answer: *The current code in all respects must be met for an COMM 66 occupancy. This will include the provisions of COMM 50 through 64, not just 66.*

Question 2*: An existing warehouse is being converted into an office building. Which codes will apply?*

Answer: *Although the use of this building is changing, it is staying within COMM 54. Therefore, the code requirements in effect at the time the building became a warehouse will apply to the building. However, because the building is changing from a very low occupant density warehouse to a comparatively high occupant density office, the current code requirements related to such issues as toilet facilities, aggregate exit width and heating and ventilating will apply to this change of use.*

Question 3*: An office building is being converted into a warehouse. Which code provisions apply?*

Answer: *As indicated in the commentary and previous question, the code provisions in effect at the time of initial COMM 54 occupancy would basically apply. However, current code requirements for the new use would also apply such as increasing the floor loading capacity to that required for a warehouse as opposed to the smaller live loads permitted when it was an office.*

(4) REST ROOM PARITY. Rest room parity applies to any facility where the public congregates which has a general capacity or seating capacity of 500 or more persons and meets the following conditions:

(a) A new structural facility;

(b) A new facility without a permanent structure;

(c) An existing structural facility with alterations that affect 50% or more of the square footage of the facility;

(d) An existing structural facility in which an addition has a square footage equal to or greater than 51% of the square footage of the existing structure; and

(e) An existing facility with no permanent structure with an addition of land to the facility equal to or greater than 51% of the existing facility acreage.

NOTE: The percentage requirements established in this subsection shall apply to the accumulative sum of any remodeling or additions, or both, undertaken after March 1, 1994. The addition of land applies only to that portion of added land which is specified as the expansion of the facility or event on that parcel and may not mean the total added land area to an existing facility or event.

COMM 50.04 BUILDINGS EXEMPT FROM CODE REQUIREMENTS.

COMM 50.04 This section lists those occupancies and buildings which are exempt from code requirements. It is not necessary to meet the provisions of the building code for these types of buildings, nor is it necessary to submit plans to this department for review and approval. Owners of exempt buildings, however, occasionally desire state approval of the plans. The department will, upon request, review exempt buildings against the provisions of the state building code. If this service is desired, at least one copy of the plans should be submitted to a state office accompanied by a plan approval application form. Plan review fees based on Table 2.31-2 are required at the time of submittal. The applicant will receive a plan review letter indicating the findings of the review. A conditional approval will not be issued by the department, nor will the plans be stamped conditionally approved

This code does not apply to the following types of buildings:

Although not codified, retroactively to 1989, s. 101.15 (2), Stats., has exempted certain rural school buildings having only one classroom when the school is open.

(1) One- and 2-family dwellings and outbuildings in connection therewith such as barns and private garages.

(2) Buildings used exclusively for farming purposes.

Note: For a definition of "farming," see s. 102.04 (3), Stats.

Question: *Due to the size and complexity of farm operations, there is some confusion with respect to what is and what is not considered farming, exempt from code requirements. Please clarify this section.*

Answer: *The Building Code deals with buildings and the use of those buildings, not with corporate structure or size. As farming is defined broadly as the cultivation and planting, raising, harvesting, processing, storage, delivery to market, and delivery to the final consumer of farm products, and, the operation must be accomplished by the farmer (individual, employe of the individual, or employe of a corporation involved with the above farming operations). Tests can be applied to determine if the building is exempt.*

1. Is the building used for storage, processing, packing, etc., of farm products, 90 percent of which were raised by the building owner on farms the building owner owns?

2. Is the building used for the storage of seed, fertilizer or other products, 90 percent of which the building owner will use to raise the farm product on farms owned by the building owner?

3. Is the building used for the storage or repair of equipment the building owner will use to raise, process, or deliver farm products, of which 90 percent were raised by the building owner?

4. Is the building used for the sale of farm products raised by the building owner on farms owned by the building owner, and no more than 10 percent of the retail sales area is devoted to sale of other items?

5. Is the building used for office purposes to run the operations only on farms, all of which are owned by the building owner?

The term "owned" as used here can also mean "rented" such as with a tenant farmer. The tests must be applied to the entire building; however, a storage building, for example, portions of which are rented to several different farmers for storage of farm products, would be considered as a building under the scope of the code as 90 percent of the stored products in the building were not raised by the building owner.

Apply tests based on the definitions of farming found in COMM 51.01 (42) to the building, and if the building passes the tests, consider it a farm building.

If the answers to questions such as the above are yes, the building is farming and exempt, regardless of the size of the farm operation or the number of employes involved in the farming operation.
Some examples of operations which are NOT farming:

Horse riding stable: Business is riding, not raising horses.

Horse boarding stable: Business is storing of horses not owned by the stable owner.

Co-ops: Products have not been raised by the co-op. They have been raised by members of the co-op. The co-op doesn't own the farms.

Commercial processors (Oreida, Green Giant, etc.): 90 percent of products were not raised by the processor.

Seed dealers: Seed being sold was not raised by the dealer.

Commercial grain storage: 90 percent of grain was not raised by the storage facility operator.

Poultry processing: Poultry processed was raised by other farmers, not by the processor.

Saw mills: Statutory definition excludes from farming.

Farming basically involves the entire process from the cultivating of the soil through harvesting and processing to delivery to market or to the final consumer of farm products. The farm products involved, however, must have been raised on the farm premise by the owner. Processing or handling of farm products received from another farmer is not permitted under the farming definition.

Some common occupancies associated with farming deserve comment. A horse riding arena is commercial even if the horses are owned by the building owner if the public enters the building for recreation. The building is either an COMM 54 or 55 occupancy depending on the number of people. A produce stand or building, operated by a farmer, is farming and exempt provided the farmer has raised substantially all of the produce being sold. However, if the stand or building sells items not raised by the owner of the structure, it is commercial.

***Question 1**: A large sod farmer has, in conjunction with his sod business, a significant office building, storage and repair garages which are provided for the farm equipment and semi-trailer trucks used to deliver the sod nationwide, and warehouse buildings which are provided for the storage of the seed, fertilizer and harvested sod. The sod farmer handles and delivers only sod which is raised on his farm. Do the Dept. of Commerce building codes apply to any of the buildings on the farm?*

***Answer:** No. Even though the farmer has many employees, buildings with occupancies which appear to be covered by the code, and an interstate trucking operation, the operation is considered farming and therefore exempt from code requirements.*

***Question 2**: The same conditions are present as in the previous question, however, the farmer, in addition to handling sod grown on his farm, also handles sod from other sod farms. Do any of the Dept. of Commerce codes apply?*

***Answer:** Yes. Because the farmer is not handling products which he has not raised on his farm, the operation becomes commercial falling under the scope of the building code. It is possible that some buildings could still be considered farming and exempt. A warehouse storing fertilizer and seed for use only on that farmer's farm would be farming and exempt. The office, delivery truck garage, and facilities for repairing those delivery trucks would be commercial as they are involved with the sod from another farm.*

(3) Buildings used primarily for housing livestock or for other agricultural purposes, located on research or laboratory farms of public universities or other state institutions.

(4) Temporary buildings, used exclusively for construction purposes, not exceeding 2 stories in height, and not used as living quarters.

(5) Buildings located on Indian reservation land held in trust by the United States.

Indian Casinos *- Via casino compacts, individual tribes may agree to submit casino plans for review of compliance for codes such as COMM 50-64 Public Buildings; COMM 16 Electrical; COMM 10, 11, and 14 Fire Prevention; COMM 81-87 Plumbing. The Department will review these plans following typical processes and procedures including fee requirements. Typically the compacts call for the tribe to engage certified inspectors to conduct inspections and prepare inspection reports which are forwarded to the Bureau of Indian Affairs and the Lottery Board. Designers working on these types of projects should contact the appropriate tribal officials for details of compact agreements pertinent to that project.*

(6) Buildings owned by the federal government. Buildings owned by other than the federal government and leased to the federal government are not exempt.

The shell of buildings leased to the federal government are subject to this code, however interior features would be exempt. If a non-federal tenant subsequently occupies the building, then this code would apply and corrections may need to be made.

(7) Bed and breakfast establishments as defined in s. COMM 51.01 (11a).

For a bed and breakfast to be exempt from the requirements of this code, it must meet ALL of the criteria indicated in COMM 51.01 (11a) and it must be licensed as a bed and breakfast by the Department of Health and Family Services.

Question 1*: May a new building be licensed as a bed and breakfast?*

Answer: Yes, it may be licensed by the Department of Health & Family Services provided it meets the licensing requirements of that department. However, as the building fails to meet the criteria requiring that the building be completed prior to May 11, 1990, ***the building must be constructed in accordance with the provisions of COMM 50 through 64 and 69 as an COMM 57 occupancy****. This will require submission of plans in accordance with COMM 50.12. Also, a building constructed after May 11, 1990, and being converted to a bed and breakfast must comply with the provisions of COMM 50 through 64 and 69 as an COMM 57 occupancy in effect at the time of conversion.*

Question 2*: Do the COMM 69 barrier-free provisions apply to a bed and breakfast?*

Answer*: If the bed and breakfast establishment meets all of the criteria indicated in COMM 51.01 (11a) and is licensed as a bed and breakfast by the Department of Health and Family Services, it is exempt from the requirements of the state code provisions in COMM 69. Owners and operators should be aware that federal ADAAG 9.1.1 only exempts buildings with five or fewer rooms for rent in conjunction with the proprietor's residence. Owners and operators of bed and breakfast establishments with six, seven, or eight rooms for rent should check with the appropriate federal agencies with regard to applicable ADAAG requirements.*

If the bed and breakfast establishment does not meet all of the criteria indicated in COMM 51.01 (11a), the provisions of COMM 69 will apply.

Question 3*: May a building contain another use along with the bed and breakfast and retain its exemption from COMM 50 through 64 and 69?*

Answer: *No. The exemption from the commercial code applies only to those bed and breakfast establishments exclusively meeting the criteria in COMM 51.01 (11a). Thus a building with a bed and breakfast and another occupancy must comply with the provisions of COMM 50 through 64 and 69, applying the provisions of COMM 57 to the bed and breakfast and the appropriate occupancy chapter to the other occupancy.*

(8) Community-based residential facilities located in existing buildings and providing care, treatment and services to 3 to 8 unrelated adults.

(9) An adult family home certified under s. 50.032 (1) (b), Stats.

(10) A one- or 2- family dwelling in which a home occupation is located.

(11) Multifamily dwellings within the scope of ch. COMM 66, except as provided in s. COMM 66.60.

Question: *A single-family residence is exempt from the requirements of COMM 50-64. When a single-family residence is attached to a building governed by the commercial code (COMM 50-64), is an occupancy separation required?*

Answer: *When reviewing a single-family residence attached to a commercial use, evaluate the effects of the residence on the commercial use. Code requirements relating to furnace and garage isolation, shaft enclosure, class of construction, number of stories, distance to property line or another building, etc., must be provided within the single-family residence or a separation equivalent to the most stringent fire ratings required by COMM 50-64 for the construction features must be provided. Plans submitted for review of COMM 50-64 requirements shall indicate the single-family residence and show the method of compliance with COMM 50-64 for items affecting the commercial part of the building. See COMM 51.08 (2).*

COMM 50.05 EXISTING BUILDINGS CODE.

Buildings and structures erected prior to the effective date of the first building code (October 9, 1914) shall comply with the general orders on existing buildings, chs. Comm 75-79, issued by the department. Buildings and structures constructed after October 9, 1914, shall comply with the code in effect at the time.

See commentary under COMM 50.02 and 50.03. The code that applies to a building is the code in effect at the time the building took its present use. If that building took its present use prior to 1914, the existing building code, chs. Comm 75-79, will apply.

COMM 50.06 LOCAL REGULATIONS.

(1) This code shall not limit the power of cities, villages and towns to make, or enforce, additional or more stringent regulations, provided the regulations do not conflict with this code, or with any other rule of the department, or law.

(2) EXCEPTION. Pursuant to s. 101.75 (2), Stats., all manufactured multifamily dwellings approved by the department shall be deemed to comply with the requirements of all building ordinances and regulations of any local government except those related to zoning and siting requirements including, but not limited to, building setback, side and rear yard requirements and property line requirements.

Note: This exception applies only to those building elements and building parts covered under the provisions of s. COMM 50.125 Wisconsin Insignia. The exception does not apply to on-site constructed elements such as, but not limited to, footings, foundations, attached porches, steps, concrete floor slabs and on-site constructed mechanical systems.

Designers should always check with the municipal, town, and county authorities to determine if there are local ordinances which are more restrictive than the state building code. Except for manufactured

multifamily dwellings, you may have to meet more restrictive or additional local requirements in the design of the building.

Subchapter III -- Design and Supervision

COMM 50.07 DESIGN.

Every new building, or alteration to a building, shall be designed in compliance with this code.

(1) Buildings containing not more than 50,000 cubic feet total volume. The plans and specifications for every new building, or alteration to a building, containing not more than 50,000 cubic feet total volume, or addition to a building in which the volume of the addition results in the entire building containing not more than 50,000 cubic feet total volume, may be prepared by a registered architect, engineer, designer, contractor or an authorized agent.

(2) Buildings containing more than 50,000 cubic feet total volume. The plans and specifications for every new building, or alteration to a building, containing more than 50,000 cubic feet total volume, or addition to a building in which the volume of the addition results in the entire building containing more than 50,000 cubic feet total volume, shall be designed as follows:

(a) *Building or structural design.* The plans and specifications for the design of the building or structure shall be prepared, signed and sealed by a Wisconsin registered architect or engineer.

If the volume of the building exceeds 50,000 cubic feet, a registered professional is required to sign and seal the submittal. The volume of the building is that volume which the building will have following completion of the proposed project.

Although the building code implies that only the plans and specifications require a seal, the signing and sealing requirements of the Department of Regulation and Licensing are more encompassing and require seal, signature and date on all prepared documents.

Question 1: *Please give a clear set of guidelines for signing and sealing documents which are submitted to Buildings and Structures.*

Answer: *The requirements for signing and sealing of documents as found both in the Dept. of Commerce Administrative Code in the Wisconsin Statutes, and Administrative Code relating to Architects, Professional Engineers, Designers, and Land Surveyors, Section A-E2, specifies that the signing and sealing be done as follows:*

A. The seal shall be original ink or embossed. No sticker, photocopied or electronic image is permitted.

B. The signature and date must be in ink. (Currently it is recommended that the ink used for signing, sealing, and dating be in contrasting color to the ink used on the plans.)

C. Each sheet or a title or index sheet which clearly identifies all other sheets comprising the bound volume must be signed, sealed, and dated. The index must clearly indicate the other sheets by title. Designating sheet 1 of 4 etc. is ***not*** *permitted for plans.*

D. All items submitted shall be signed, sealed, and dated. This includes but is not limited to:

1. *Plans.*
2. *Specifications.*
3. *Revisions, changes or deletions.*
4. *Requested additional information.*

5. Required calculations.
6. Component design.

E. Specifications with multi-page indexes will be accepted with a single signature, seal, and date on the title or index if the engineer or architect indicates he/she is responsible for the entire specifications. Otherwise, each portion shall be signed, sealed and dated by the responsible engineer or architect.

F. If truss framing plans are submitted with the building plan and are signed, sealed, and dated as per (C) above, truss shop drawings or erection plans reflecting the framing plans may be provided with a stamp and building designer's signature indicating he/she reviewed the erection plan.

***Question 2:** If I add 26,000 cubic feet of addition to an existing building of 40,000 cubic feet, must a registered professional be involved and the plans signed, sealed and dated?*

***Answer:** Yes. The total volume of the building, after completion of a proposed project, will be 66,000 cubic feet. As this exceeds 50,000 cubic feet, registered professional design is required.*

***Question 3:** Due to the size and location of my project, I will be submitting my plans to a certified city for review. The building exceeds 50,000 cubic feet. Must the plans be signed, sealed and dated?*

***Answer:** Yes. Whether the plans are submitted to the state for review or to a certified city, if the volume of the building exceeds 50,000 cubic feet, involvement of a registered professional is required.*

(b) *Heating, ventilating and air conditioning design.* The plans and specifications for the heating, ventilating and air conditioning system shall be prepared, signed and sealed by a Wisconsin registered architect, engineer or designer.

(c) *Energy conservation design.* The plans and specifications for energy conservation design shall be prepared, signed and sealed by a Wisconsin registered architect, engineer or designer.

Note 1: See s. COMM 51.01 (139a) for definition of total volume.

Note 2: The above terms "registered architect, engineer or designer" mean registered architect, registered professional engineer or registered designer as defined by laws regulating the practice of engineering and architecture found in ch. 443, Stats. Registered designers are limited to the specific limitations outlined in s. A E 5.06. See s. A-E 2.02 (4) for rules pertaining to signing, sealing and dating of plans prepared by a registered architect, engineer or designer.

Note 3: According to s. 87.30, Stats., the construction or placement of every building, structure, fill or development placed or maintained within any flood plain is required to satisfy local or state regulations.

(3) ANTENNAS AND SUPPORTING TOWERS EXCEEDING 200 FEET IN HEIGHT. The plans and specifications for antennas and supporting towers exceeding 200 feet in height shall be prepared, signed and sealed by a Wisconsin registered architect or engineer.

These plans may be submitted directly to a certified city. However, if desired, the local inspector may request that the plans be submitted to this department if the local inspector does not feel qualified to analyze the structural design.

COMM 50.08 PLANS, SPECIFICATIONS AND CALCULATIONS PREPARED OUTSIDE WISCONSIN.

Plans, specifications and calculations for buildings and structures under s. COMM 50.07 (2) and (3), may be prepared by an architect or engineer registered outside of the state of Wisconsin, provided the following conditions are satisfied:

(1) REGISTRATION. The state agency or entity which registers the architect or engineer shall be an agency or entity recognized by the department of regulation and licensing as having equivalent standards for registration.

(2) SEAL. The plans, specifications and calculations shall bear the signature and seal or stamp of a registered architect or registered engineer.

(3) CERTIFICATE. A certificate, dated, signed and sealed by an architect or engineer registered in Wisconsin, shall be attached to the plans, specifications and calculations. The certificate shall indicate that the plans, specifications and calculations were prepared in a state other than Wisconsin by an architect or professional engineer registered in that state; describe the work performed by the Wisconsin registered architect or engineer; and include statements to the effect that the plans and specifications have been reviewed and comply with all applicable local and state buildings codes, and that the reviewing architect or engineer will be responsible for the supervision of construction in accordance with the requirements of s. COMM 50.10.

Plans which are prepared outside of the State of Wisconsin, by a professional who is not registered in the State of Wisconsin, must be submitted to this department or its authorized representative via a Wisconsin registered professional. The Wisconsin registered professional must attach to the sets of plans a letter, bearing the Wisconsin registrant's seal, signature and date, certifying that the plans have been reviewed by the Wisconsin professional and that they comply with all applicable local and state building code requirements.

The Wisconsin registrant certifying the accuracy of the out-of-state plans must also be the supervising professional for the project.

COMM 50.10 SUPERVISION.

All constructions or installations under s. COMM 50.07 (2) and (3) shall be supervised by a Wisconsin registered architect or engineer, except that a Wisconsin registered designer may supervise the installation of heating, ventilating and air conditioning systems and illumination systems. The person responsible for supervision shall also be responsible for the construction and installation being in substantial compliance with the approved plans and specifications. Should the supervising architect, engineer, designer, or the department, be confronted with a nonconformance to the code during, or at the end of, construction, said parties, together with the designing architect, engineer or designer shall effect compliance or shall notify the department of the noncompliance.

All construction and installation work on a building having a volume in excess of 50,000 cubic feet must be done under the supervision of a Wisconsin registered professional. The basic discussion for this section is similar to that provided for COMM 50.07.

(1) DEFINITION. Supervision of construction is a professional service, as distinguished from superintending of construction by a contractor, and means the performance, or the supervision thereof, of reasonable on-the-site observations to determine that the construction is in substantial compliance with the approved plans and specifications.

Question: *COMM 50.10 requires that a supervising professional be retained by the owner for the performance or supervision of reasonable on-the-job observations. What types of observations are expected from a supervising professional?*

Answer: *The professional must perform adequate on-the-site observations to be able to file a compliance statement stating:*

To the best of my knowledge, belief, and based on onsite observations, construction of the following building and/or HVAC items applicable to this project have been completed in substantial compliance with the approved plans and specifications. (See sample Compliance Statement)

(2) NAME OF SUPERVISING ARCHITECT, ENGINEER OR DESIGNER. Prior to the start of construction, the owner of the building or structure, whose name must be a part of, or accompany, all plans submitted for approval, as required by s. COMM 50.12 or an authorized agent, shall designate to the department, in writing, the name and Wisconsin registration number of the architect, engineer or designer retained to supervise construction of the building or structure.

The application form, which must be submitted with all plans, must bear the signature, registration number and address of the professional who is responsible for supervision of construction. Plans will not be reviewed if the name of the supervising professional is not provided. The signature on the application form must be original; copies are not accepted on the initial submittal for a building project. See COMM 50.12 (5) commentary for requirements for subsequent component submittals.

(3) COMPLIANCE STATEMENT. Prior to initial occupancy of a new building or addition and prior to final occupancy of an alteration of an existing building, the supervising architect, engineer or designer shall file a written statement with the department certifying that, to the best of his or her knowledge and belief, construction of the portion to be occupied has been performed in substantial compliance with the approved plans and specifications. This statement shall be provided on a form prescribed by the department.

Prior to occupancy, the supervising professional is required to file a compliance statement with the department. Most municipalities also will require a compliance statement, thus the supervising professional is encouraged to send a copy to the Division of Safety & Buildings and the municipality.

***Question 1**: I am the supervising professional for a building for which the owner and I have had a parting of the ways and I am now removed from the project. The building is not complete. What should I do?*

Answer:** You should notify the department immediately, in writing, that you are no longer responsible for supervision of the construction, providing the date that you left the project. You should file a compliance statement for the work done prior to that date. The department will notify the building owner that a supervising professional is required and request that the owner provide the name, registration number and address of the supervising professional who will replace you. **The owner is responsible for assuring that no work takes place during the interim period prior to hiring another supervising professional.

***Question 2:** My plans were reviewed by a certified municipality rather than the state. Must I file a compliance statement?*

***Answer:** Yes. Whether the plans are reviewed by the state or a certified municipality, the requirement for a compliance statement applies.*

COMPLIANCE STATEMENT
Instructions for Use

1. Project Information

If label isn't provided, please complete project information. If a project label generated by the Division of Safety & Buildings is used, no additional entry in part 1. is needed.

2. Purpose of this Statement

Indicate whether your statement is for the building, HVAC, or lighting. Thus, a separate submittal from the building supervising professional, the HVAC supervising professional and the lighting supervising professional is possible.

Partial occupancy or phased occupancy is achieved by checking the partial completion box and describing the general area to be occupied.

2A. Statement of Substantial Compliance

If on-site observations determined the project is in substantial compliance, check this box. Also, check the box indicating building, HVAC or lighting items listed were in substantial compliance. The items listed are the minimum items to be completed. Minor items not critical to life safety that are not completed or not quite in compliance may be listed.

Note that the statement in 2A indicates items applicable to the project, thus if the project doesn't have a sprinkler system or structural components, etc., no other notation is needed. Note the SB-118 application form clarifies the building designer's and supervising professional's responsibility for structural component design in Box 13 as follows:

The department expects, and requires, that the project designer review individual component submittals for compliance with the general design concept. The project designer, and department, will rely on the seal of the component designers for compliance with the codes as they apply to their designs.

2B. Statement of Noncompliance

This portion of the form may be utilized to call the inspector's attention to noncompliance items. Typically this will be used where the supervising professional is having problems getting corrections done and needs to team with the inspector.

2C. Supervising Professional Withdrawn

Use this to notify the Department so that the owner can be requested to provide the name and registration number of the new professional prior to continuing with the project. Note that when withdrawing from a project, it is necessary to complete A or B to indicate the project status at time of withdrawal.

2D. Abandoned

3. Signature

Check off and sign as appropriate.

Compliance Statement

This form is required to be submitted by the supervising professional (architect, engineer, HVAC designer or electrical designer) observing construction of projects within buildings with total areas exceeding 50,000 cubic feet and construction of antennas, towers, and bleachers (COMM 50.10). Failure to submit this form may result in penalties as specified in COMM 50.26 and/or local ordinances.

General Instructions: Prior to the initial occupancy of new buildings or additions and the final occupancy of altered existing buildings, submit this completed and signed form to the municipal building inspection office and Safety and Buildings Division, P.O. Box 7162, Madison, WI 53707-7162

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04 (1)(m)].

1. PROJECT INFORMATION: (Use the Safety and Buildings or municipal project label, or type or print the information. If label is used, no additional entry is needed on Part 1.

	Owner Information	**Project Information**
LABEL HERE	Name	Building Occupancy Chapter(s) & Use
	Company Name	Tenant Name (if any)
	Number and Street	Building Location (number & street)
	City	☐ City ☐ Village ☐ Town of County of
	State and Zip Code	Property Identification Number
	Plan or Reference Number	Name & Reg. # of Supervising Prof. for ☐Building ☐HVAC ☐Lighting
	Name & Reg. # of Supervising Prof. for ☐Building ☐HVAC ☐Lighting	Name & Reg. # of Supervising Prof. for ☐Building ☐HVAC ☐Lighting

2. PURPOSE OF THIS STATEMENT: (Check Box A, B, C, or D to indicate purpose and complete any other applicable boxes and information. Attach additional pages if necessary.)

Check those which apply: ☐ Building ☐ HVAC ☐ Lighting

☐ Partial Completion _____
Description of Portion Completed

A) ☐ Statement of Substantial Compliance

To the best of my knowledge, belief, and based on onsite observation, construction of the following building and/or HVAC items applicable to this project have been completed in substantial compliance with the approved plans and specifications.

BUILDING ITEMS

1. Structural system including submittal and erection of all building components (trusses, precast, metal building, etc.)
2. Fire protection systems (sprinklers, alarms, smoke detectors) designed, installed, and tested (including forward flow on back flow devices) by appropriately registered professionals
3. Shaft and stairway enclosure
4. Exits including exit and directional lights
5. Fire-resistive construction, enclosure of hazards, fire walls, labeled doors, class of construction
6. Sanitation system (toilets, sinks, drinking facilities)
7. COMM barrier-free requirements
8. All conditions of building plan approval and applicable variances

HVAC ITEMS

1. HVAC system including final test (COMM 64.53)
2. All conditions of HVAC plan approval and applicable variances

LIGHTING ITEMS

1. Exterior lighting & control requirements
2. Interior lighting & control requirements
3. All conditions of lighting plan approval and and applicable variances

The following items are not in compliance and must be addressed: _____

_____

B) ☐ Statement of Noncompliance

Due to the following listed violations, this project is not ready for occupancy: _____

_____

C) ☐ Supervising Professional Withdrawn From Project (Use A or B above to indicate project status as of this date.)

D) ☐ Project Abandoned

3. SUPERVISING PROFESSIONAL SIGNATURES FOR:

☐ Building ☐ HVAC ☐ Lighting _____ Date _____

☐ Building ☐ HVAC ☐ Lighting _____ Date _____

☐ Building ☐ HVAC ☐ Lighting _____ Date _____

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COMM 50.11 OWNER'S RESPONSIBILITY.

No owner may construct or alter any building or structure, or portion of a building or structure, or permit any building or structure to be constructed or altered except in compliance with the provisions of chs. COMM 50 to 64. Compliance with the provisions of this section does not relieve the owner from compliance with the administrative rules established in other related codes.

*The **owner is the key person** in the construction process. The owner's responsibility is to ensure that required plans are prepared by a competent, properly registered (COMM 50.07) designer, submitted to the pertinent agencies, and approved prior to the start of construction. The **owner is ultimately responsible** for the construction and maintenance of buildings in compliance with this and other pertinent codes. It is important that **the owner** has **open communication** with those he or she delegates to perform these duties. The owner can avoid plan approval delays and inspection problems by initially **formulating the** building concepts and **uses** in his mind, **clearly relaying this** to the designer, **informing** the designer **of changes** in plans prior to implementing these changes, **ensuring proper supervision** (COMM 50.10) during construction, and **the submittal of a compliance statement** [COMM 50.10 (3)] prior to occupancy. To assure that the owner is aware of his/her responsibility, the plan review application form SB-118 includes a statement of the owner's basic responsibility and requires the owner's signature acknowledging this.*

Note 1: For definition of owner, refer to s. 101.01 (2) (e), Stats.

Note 2: Section COMM 50.07 specifies which plans and specifications must be prepared by a registered architect, engineer or designer. Section COMM 50.10 specifies which construction must be supervised by a registered architect, engineer or designer. Section COMM 50.10 (2) specifies the owner's responsibilities in informing the department of the construction supervisor. Sections COMM 50.10 (3) specifies the requirements for filing compliance statements prior to occupancy. Section COMM 50.12 specifies the requirements for plan submittal and approval. Section COMM 50.12 (5) requires submittal of a plan approval application form, and that form must be signed by the owner.

COMM 50.115 NOTICE OF INTENT.

Special Note: We have included in this commentary book a draft of Ch. Comm 65, Construction Site Erosion Control as it existed at the time of publication. This is the draft of the rules submitted to the Legislature for approval as of November 1998. It is subject to possible change and its effective date has not been set. There are additional provisions in Ch. Comm 50 which are not reflected in this edition of the Commentary, due to the possibility of revisions. Consult the Wisconsin Building Codes Report *for updates.*

(1) A notice of intent for coverage under a Wisconsin Pollutant Discharge Elimination System (WPDES) General Permit No. WI-0067831-1 for storm water discharges associated with construction activities, as required by 40 CFR part 122, shall be filed by the landowner for the construction project of a public building or a building that is a place of employment disturbing 5 or more acres of land. A construction site soil erosion control plan and storm water management plan shall be prepared in accordance with good engineering practices and the design criteria, standards and specifications outlined in the Wisconsin Construction Site Best Management Practices Handbook published by the department of natural resources (WDNR Pub. WR-222 November 1993 Revision).

Note: Copies of the Wisconsin Construction Best Management Practice Handbook are available through Wisconsin Department of Administration, Document Sales, 202 S. Thornton Ave., Madison, WI 53707.

(a) Prior to filing a notice of intent, a site specific soil erosion control plan and storm water management plan shall be prepared in accordance with ss. NR 216.46 and 216.47, respectively. If the soil erosion control plan or actions required by the plan fail to control the construction site soil erosion, the plan shall be amended or other actions taken to control construction site soil erosion.

The Department of Natural Resources may request long-term storm water management plans.

Minimum information to be contained in the ***erosion control plan*** *includes the following:*

Narrative Portion of Plan

- *Site description and description of construction activity*
- *Intended sequence of major land disturbing activities (grubbing, excavating, or grading)*
- *Size of total site and estimate of area to be disturbed*
- *Estimates of runoff coefficient of site before and after completed construction*
- *Description of existing surface and subsoil*
- *Depth to groundwater (available from Natural Resource Conservation Service – NRCS; previously Soil conservation Service – SCS)*
- *Name of immediate named receiving water from the United States geological service 7.5 minute series topographic maps or other appropriate source*
- *Description of interim and permanent stabilization practices including a schedule for implementation*
- *Description of appropriate control measures to be used on the site*

Site Map Requirements

- *Existing and proposed topography and drainage patterns, buildings, roads and surface waters*
- *Boundary of land disturbing activities*
- *Boundaries of phased construction areas*
- *Location of major structural and non-structural controls identified in the plan*
- *Location of various stabilization practices – temporary and permanent*
- *Location of wetlands and locations where storm water is discharged to either surface water or wetland*

(b) The landowner shall implement the soil erosion control plan throughout the construction period. Soil erosion control measures shall be installed and maintained at the construction site until the construction site is stabilized and a notice of termination is filed with the department stating that the site has undergone final site stabilization in accordance with s. NR 216.55.

On-site measures shall include, when appropriate, the following minimum measures:

On-site Control Measures

- *Manage overland flow – use diversions, where possible, to divert flow from exposed soils*
- *Trap sediment where necessary in channelized flow*
- *Stage construction to limit exposed soils subject to erosion*
- *Protect on-site downslope drainage inlets*
- *Minimize tracking*
- *Clean up of off-site sediment deposits*
- *Proper disposal of building and waste material at all sites*
- *Stabilize drainage ways*

- *Permanently stabilize areas as soon as possible after final grading*
- *Minimize dust to the maximum extent possible*
- *Measures are to be installed and maintained according to the BMP handbook*
- *Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive flow from the structure to a watercourse so that the natural physical and biological characteristics and functions are maintained and protected.*
- *If measures implemented according to the plan fail to control construction site soil erosion, additional measures shall be taken to minimize sediment from leaving the site.*

(c) The landowner shall meet the reporting and monitoring requirements in s. NR 216.48.

The following management measures shall be implemented to meet the requirements of the code:

Information

- *A copy of the plan shall be kept at the site*
- *A copy of the NOI shall be kept at the site*

Monitoring Requirements

Per NR 216.48, the construction must be monitored and maintained to ensure that erosion control measures are working and stay in place.

- *Weekly inspections of implemented erosion and sediment controls at the construction site*
- *Inspections of erosion and sediment controls within 24 hours after a rainfall of 0.5 inches or more, which results in runoff during active construction periods.*

Reporting Requirements

- *A log shall be maintained at the site to include the following information:*
  - *the date, time and exact location of the inspection*
  - *the name of the individual who performed the inspection*
  - *an assessment of the condition of the erosion controls*
  - *a description of any erosion control implementation and maintenance performed*
  - *a description of the present phase of construction at the site*

A sample log, that when complete, would meet the reporting requirements is included in the commentary.

Submittal of the above information, including plans and monitoring log, may be requested at any time by the department.

Copies of the erosion control and storm water management plans, amendments to plans, supporting data and reports, and monitoring records must be retained for a period of 3 years from the date of terminating coverage under the WPDES general permit.

(d) The department may inspect and enforce the provisions of this section in the event of violations. Additional information requested by the department to ascertain compliance with this section shall be submitted within the time period specified by the department.

(e) If the department of natural resources determines the construction site to be a significant source of storm water pollution, the department of natural resources may require the site to be covered by an individual WPDES storm water discharge permit.

Note: An industrial construction site covered by this section may also require an Industrial Storm Water Discharge Permit issued by the department of natural resources as provided in subch. II of ch. NR 216.

(2) A notice of intent shall be filed either with the department or with certified municipalities and counties authorized to review plans and perform inspections, s. COMM 50.21. Municipalities and counties shall file a copy of the notice of intent with the department. The notice of intent shall be filed on form 3400-161 published by the department of natural resources.

Note: Copies of form 3400-161 may be obtained from the department or the department of natural resources.

Form 3400-161 has been updated to form SBD 10376 to reflect information needed by the Division of Safety & Buildings. A copy of this form is included in this commentary and additional copies are available from the division.

(3) The notice of intent form shall be completed in accordance with instructions and filed at least 14 working days prior to commencement of construction. If a notice of intent is filed prior to the submission of plans for the construction of a public building or a building that is a place of employment, a copy of the notice of intent shall be filed with the plans submitted for approval.

(4) The department shall provide a summary of notice of intent information collected to DNR.

(5) A landowner filing a notice of intent under this section shall be exempt from the department of natural resources' $200 fee associated with filing form 3400-161.

Erosion Control Inspection Log

Inspections are to be conducted weekly and withon 24 hours after a precipitation event of 0.5 inches or greater which results in runoff during active construction periods. If the project is phased, include the current phase in the description of erosion control activity

Project Location: _____

Project Identification Number: _____

Project Start Date: _____ Projected End Date: _____

Inspection Agency Phone Number: _____

Date & Time	**Assessment of Erosion/Sediment Control**	**Implementation** (include location within site and phase - if applicable)	**Maintenance Performed** (include location within site and phase - if applicable)	**Person Performing Inspection** (signature required)

State of Wisconsin
Department of Commerce
Division of Safety and Buildings

NOTICE OF INTENT

For Storm Water Discharges Associated With Commercial Building Construction Activities Under a General WPDES Permit

Form 3400-161 (SBD-10376)

Commercial Building Construction Sites

PLAN REVIEW # _____

This form is authorized by s. 147.025, Wis. Stats. Submittal of a completed form to the Department is mandatory for any owner of a construction site storm water discharge who must apply for a permit in accordance with 40 CFR Part 122, Chapter 101, Wis. Stats., and Chapter COMM 50, Wis. Adm. Code. Failure to submit a completed form to the Department at least 14 working days prior to the date on which construction is scheduled to commence may result in fines not to exceed $10,000 per day, pursuant to s. 147.21(2), Wis. Stats. Personally identifiable information on this form may be used for other water quality program purposes.

Submission of this NOTICE OF INTENT constitutes notice that the party identified in Section I of this form intends to be authorized by a general WPDES permit issued for storm water discharges associated with construction activity in the State of Wisconsin. Becoming a permittee obligates such discharges to comply with the terms and conditions of the general permit. An erosion control plan and storm water management plan meeting the requirements of Chapter NR 216, Wis. Adm. Code, must be completed before filing this NOTICE OF INTENT.

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

SECTION I: OWNER/OPERATOR INFORMATION

Name	Contact Person
Mailing Address	Title
City, State, Zip Code	Telephone Number

SECTION II: CONTRACTOR INFORMATION (when known)

Name	Contact Person
Mailing Address	Title
City, State, Zip Code	Telephone Number

SECTION III: CONSTRUCTION SITE INFORMATION

Site Name: _____ County: _____

Location Address: _____ City / Village / Township: _____

Mailing Address: _____

City: _____ State: Wisconsin Zip Code: _____

Quarter Quarter: _____ Quarter: _____ Section: _____ Township: _____ N Range: _____

Is this site wholly contained on the above quarter quarter section? _____

Total Area of Construction Site: _____ Acres Total Estimated Disturbed Area: _____ Acres

Distance From Perennial Water to Land Disturbance: 0-50 ft.___ 51–100 ft.___ 101–150 ft.___ 150–300 ft.___ >300ft.___

Percent of Site Impervious: (including rooftops) Before Construction: _____% After Construction _____%

Maximum % Slopes within Disturbed Area: 0-6% ___ 7-15% ___ 16-20% ___ 20-30% ___ >30% ___

A Long Term Storm Water Management Plan Must Be Developed to Meet Requirements of NR216

Does your construction site's storm water discharge to: (check all that apply)

☐ Storm drain system - infiltrates to groundwater

☐ Storm drain system to surface water - enter system owner's name and receiving waters: _____

☐ Directly or indirectly to water of the state - enter name of river, lake, wetland: _____

☐ Infiltration to groundwater occurs on site

If Storm Water Discharge Occurs to WI DOT Drainage System Check With DOT for Requirements

Continued On Reverse

SECTION IV: ADDITIONAL INFORMATION

Project Start Date: _____ Project End Date: _____

Identify proposed management practices to reduce pollutants in storm water discharges: (check all that apply)

- ☐ Oil/Water Separator
- ☐ Erosion Controls
- ☐ Detention/Desiltation Ponds
- ☐ Sedimentation Controls
- ☐ Overhead Coverage
- ☐ Grass Lined Ditches
- ☐ Porous Pavement
- ☐ Rooftop Runoff Goes to Infiltration Area
- ☐ Infiltration Practice (please describe) _____
- ☐ Other (please describe): _____

Has a Construction Site Erosion Control Plan and Storm Water Management Plan been completed for this site in conformance with the "Wisconsin Construction Site Best Management Practices Handbook?" _____

(Note: These must be completed before a permit may be issued.)

Is the Construction Site Erosion Control Plan and Storm Water Management Plan in compliance with Local Sediment and Erosion Controls? _____ If Yes, please list the name of the local agency: _____

Do you have an existing WPDES permit? _____ If Yes, please list: _____

Is your construction site located in a county, city, village or town with an ordinance in effect prior to January 1, 1994, that establishes standards for erosion control at commercial building sites? _____ If Yes, please specify jurisdiction: _____

If Storm Water Discharge Occurs to WI DOT Drainage System Check With DOT for Requirements

SECTION V: CERTIFICATION

"I certify under penalty of law that this document and attachment were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provision of the permit, including development and implementation of the construction site erosion control and storm water management plan will be complied with."

Owner/Operator Printed Name	Title	Telephone Number
Owner/Operator Signature	Date Signed	

Please complete if Notice of Intent is prepared by a consultant or someone other than an employee of the site Owner/Operator.

Preparer Printed Name	Firm
Mailing Address	Title
City, State, Zip Code	Telephone Number
Signature of Preparer	Date Signed

Return Completed Form to:

SAFETY AND BUILDINGS DIVISION
201 West Washington Avenue
P.O. Box 7162
Madison WI 53707

Telephone 608-266-2128
Fax 608-267-9566

LEAVE BLANK - S&B USE ONLY
Date Received
Plan Review Number:

Instructions - SBD-10376

Notice of Intent for Storm Water Discharges Associated With
Construction Activities Under a General WPDES Permit

Please type or print your answers to all questions.

Please answer all questions. Incomplete Notice of Intent forms will be returned for completion.

SECTION I: OWNER/OPERATOR INFORMATION

Please provide the legal name of the person, firm, public organization, or any other entity that operates the construction site described in Section III of this application. The operator of the activity is the legal entity which controls the activity's operation. In most cases, this will be the site owner. The contact person should be the person completely familiar with the construction site activity and charged with compliance and oversight of the permit. The mailing address and phone number given should be for the contact person.

SECTION II: CONTRACTOR INFORMATION

If known at time of NOI submittal, provide the legal name of the person, firm, or any other entity that is the major contractor in charge of operating the construction site described in Section III of this application. The contact person should be the construction site manager completely familiar with the construction site activity and charged with implementation of the permit. The mailing address and phone number given should be for the contact person.

SECTION III: CONSTRUCTION SITE INFORMATION

Enter the construction site's official or legal name and complete address, including county, city, state and zip code. Be sure to include the quarter quarter, quarter, section, township and range (to the nearest quarter section) of the site. If the site is on more than one quarter, enter the quarter that best describes the location of the site. Use additional space if needed to describe the site location.

Indicate the total area of the construction site, and estimate the total area to be disturbed by construction activities.
Indicate the distance from perennial water to the closest area of land disturbance.
Please provide the percent of site impervious before and after construction.
Indicate the maximum % slope (existing conditions) which will be disturbed.

Please indicate where storm water discharge occurs. (There may be more than one discharge point.) If the discharge is to a storm drain system (operated by municipalities, flood control districts, utilities or other similar entities), indicate this and list the name of the receiving body of water. The operator of the storm drain system will know the ultimate receiving waters. The operator of the storm drainage system must receive a copy of the NOI. Storm water discharging directly to state waters will typically have an outfall structure directly from the site to a river, lake, wetland, etc. If the discharge is to an unnamed tributary or drainage ditch, please list the named water body to which the discharge ultimately drains. E.g., "Unnamed tributary to the Red Cedar River." Finally, please indicate if infiltration occurs on site.

SECTION IV: ADDITIONAL INFORMATION

Please enter the project's anticipated start and end dates.

Check all applicable management practices that will be used on site to control erosion or list other control measures that will be used to control erosion at the construction site.

Indicate whether or not a construction site erosion control and storm water management plan has been completed for the site. This plan must be completed before a permit will be issued, and must be in conformance with the "Wisconsin Construction Site Best Management Practices Handbook." DO NOT include a copy of the construction site erosion control and storm water management plan.

Indicate whether or not the construction site erosion control plan is in compliance with local sediment and erosion control plans. DO NOT include copies of these plans. The local agency approving these plans must receive a copy of the NOI.

If you have an existing WPDES permit, indicate this on the form and list the permit number.

Construction sites that receive erosion control plan review and inspection by a county, city, village or town with an ordinance in effect prior to January 1, 1994, that establishes standards for erosion control at commercial building sites need to indicate municipality having jurisdiction.

SECTION V: CERTIFICATION

State statutes provide for severe penalties for submitting false information on this Notice Of Intent form. State regulations require this form to be signed as follows:

1. for a corporation, by a principal executive officer of at least the level of Vice President, or a duly authorized representative having overall responsibility for the operation covered by this permit;
2. for a unit of government, a principal executive officer, a ranking elected official, or other duly authorized representative;
3. for a partnership, by a general partner; for a sole proprietorship, by the proprietor.

After signature provide the name of the individual signing the Notice Of Intent and date of signature. If the form was prepared by a consultant or someone other than an employee of the site owner/operator, please provide the name and address where this person may be contacted.

The DNR has published a handbook designed to assist contractors, consultants, and local units of government in choosing, designing and installing low cost, effective, temporary or permanent construction site Best Management Practices. This handbook, Wisconsin Construction Site Best Management Practices, is available through Document Sales, 202 S. Thornton Ave., Madison, WI 53707. For more information on the cost and to order the handbook, please call (608) 266-3358 or 1-800-362-7253.

If you need additional information about the NOI for construction activities, please contact the Department of Commerce at (608) 266-2128

State of Wisconsin
Division of Safety & Buildings

PLAN REVIEW # _____

NOTICE OF TERMINATION
Of Coverage For Storm Water Discharges Associated With Commercial Building Construction

This form is authorized by s. 147.025, Wis. Stats. Submittal of a completed form to the Department is mandatory for any owner of a construction site storm water discharge who must apply for a permit in accordance with 40 CFR Part 122, Chapter 147, Wis. Stats., and Chapter COMM 50, Wis. Adm. Code. Failure to submit a completed form to the Department after the site undergoes final stabilization may result in fines not to exceed $10,000 per day, pursuant to s 147.21(2), Wis. Stats. Personally identifiable information on this form will be used for no other purpose.

Submission of this NOTICE OF TERMINATION constitutes notice that the party identified in Section I of this form is no longer authorized to discharge storm water from construction sites under a general WPDES permit.

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM. Please read all instructions on the back of this form before completing it.

SECTION I: OWNER/OPERATOR INFORMATION

Company Name	Contact Person
Mailing Address	Title
City, State, Zip Code	Telephone Number

SECTION II: CONTRACTOR INFORMATION

Name	Contact Person
Mailing Address	Title
City, State, Zip Code	Telephone Number

SECTION III: CONSTRUCTION SITE INFORMATION

Site Name

Site Address	City, State, Zip Code
County	Plan Review Number

Quarter Quarter: Quarter: Section: Township: N Range:

Is this site wholly contained on the above quarter quarter section? (Y or N)

*Use more space if needed to describe location of site.

SECTION IV: CERTIFICATION

"I certify under penalty of law that disturbed soils at the identified site have undergone final stabilization and temporary erosion and sediment control measures have been removed, or that all storm water discharges associated with construction activity that are authorized by a general WPDES permit have otherwise been eliminated. I understand that by submitting this notice of termination, I am no longer authorized to discharge storm water associated with construction activity by the general WPDES permit, and that discharging pollutants in storm water associated with construction activity to waters of Wisconsin is unlawful where the discharge is not authorized by a general WPDES permit."

Owner/Operator Printed Name	Title	Telephone Number
Owner/Operator Signature	Date Signed	

Mail To: **Safety and Buildings Division**
201 W. Washington
PO Box 7162
Madison, WI 53707-7162

SBD-10520(R.01/98)

Instructions - Notice of Termination

Notice of Termination of Coverage for Storm Water Discharges Associated
With Commercial Building Construction

Please type or print your answers to all questions.

Please answer all questions. Incomplete Notice of Termination forms will be returned for completion.

SECTION I: OWNER/OPERATOR INFORMATION

Please provide the legal name of the person, firm, public organization, or any other entity that operates the construction site described in Section III of this application and holds or qualifies for an applicable general or individual construction site storm water discharge permit. The operator of the activity is the legal entity which controls the activity's operation. In most cases, this will be the site owner. The mailing address and phone number given should be for the contact person.

SECTION II: CONTRACTOR INFORMATION

Please provide the legal name of the person, firm, or any other entity that is the major contractor in charge of operating the construction site described in Section III of this application. The mailing address and phone number given should be for the contact person.

SECTION III: CONSTRUCTION SITE INFORMATION

Enter the construction site's official or legal name and complete address, including county, city, state and zip code. Be sure to include the quarter quarter, quarter, section, township and range (to the nearest quarter section) of the site. If the site is on more than one quarter, enter the quarter that best describes the location of the site. Use additional space if needed to describe the site location.

SECTION IV: CERTIFICATION

State statutes provide for severe penalties for submitting false information on this Notice Of Termination form. State regulations require this Notice Of Termination to be signed as follows:

1. for a corporation, by a principal executive officer of at least the level of Vice President, or a duly authorized representative having overall responsibility for the operation covered by this permit;
2. for a unit of government, a principal executive officer, a ranking elected official, or other duly authorized representative;
3. for a partnership, by a general partner; by a general partner; for a sole proprietorship, by the proprietor.

After signature provide the name of the individual signing the Notice Of Termination and date of signature. If the form was prepared by a consultant or someone other than an employee of the site owner/operator, please provide the name and address.

If you need additional information about the Notice Of Termination for construction activities, please contact the Division of Safety & Buildings at (608)266-2128.

Subchapter IV -- Department Approval

All work on public buildings and places of employment, with only a few exceptions, will require plan approval by the state or its authorized representative. In all cases, even if plan submittal is waived, the building or structure must comply with all applicable portions of the code.

The balance of this section sets forth the data which must be submitted on the plans, specifications and calculations. In addition to these code sections there are checklists in the introductory section of this commentary.

***Bound Sets**: Plans submitted to the department for review and approval must be bound into sets. The department will not accept loose sheets which are not bound into plan sets. Nor will the department accept loose plan sheets "bound" into set packages by rubber bands. The bound sets must be capable of being reviewed without removing the binding.*

In the case of separate buidling and HVAC designers, their plans may be submitted jointly or separately. In the case of a joint submission (with combined building and HVAC fees), it will be necessary for someone to coordinate the submissions, binding together the architectural, structural and mechanical drawings into sets prior to submission to the department. If a separate submission, then they shall be accompanied by separate completed application forms and appropriate separate fees.

***Plan Approval Application**: See discussion on proper completion of the SB-118 application form after COMM 50.12 (5).*

***FULL SERVICE OFFICES**. Full service offices are maintained in Hayward, La Crosse, Madison, Shawano, Green Bay and Waukesha. All plan review functions are available in these offices with some minor exceptions. Petitions for Variance that are submitted prior to plan submittal must go to the Madison office. Petitions for Variance that are submitted subsequent to a plan review must be submitted to the original reviewing office. Plans for buildings to be reviewed under the scope of COMM 70 must be submitted to Madison, LaCrosse, Shawano, or Green Bay. In addition to building plan review, all offices are available for preliminary reviews on an appointment basis.*

Once a plan has been submitted to one of the offices for review, all subsequent plan submissions for that project (HVAC, Trusses, Precast Concrete, Metal Building, Revisions, etc.) must be sent to that same office. Your project coordinators should inform other designers, contractors and subcontractors as to which is the proper office for submission of plans.

***ASSIGNMENT AND SCHEDULING OF PLANS**. If you are aware of the date when you will be ready for plan review, you may call the reviewing office and schedule a review date. If plans are received with no previous arrangement for a review date, they will be scheduled at the Division's convenience (in no case will the review date be more than 15 business days from receipt of plans). If you call and schedule a review date, the plans must be received at least **two** business days before the scheduled date of review or the project will be rescheduled for a later date. See further scheduling methods at s. Comm 50.12(5).*

You may also call and request a walk-in appointment for review so as to be present during the review to answer questions. With a walk-in appointment, you will be expected to mail in the plans two business days prior to the appointed date. We request that unless you have a need to confer directly with the examiner, that you utilize the scheduled review date provision, freeing up the walk-in appointment times for those designers who need them.

We will not schedule an appointment for resubmittals subsequent to a withhold action. Instead submit to the original reviewing office where it will be assigned review will be completed within 5 business days after receipt.

TELEPHONE CALLS. *If you have a question regarding a specific project which is currently in plan review, or under construction, you will receive more efficient service if you direct that question only to the person who reviewed the plans. The reviewer's direct phone number will be under the signature on the plan action letter.*

Please direct general questions to the persons listed in the front of the book.

PRELIMINARY REVIEWS. *If you have specific questions on issues where you are uncertain of code compliance and that cannot be resolved by telephone, mail or fax, you may request a preliminary review of those issues. Preliminary reviews are done at no charge, however, these* ***must be scheduled*** *by calling the appropriate number listed at the front of this book. Plans must be received two business days prior to the scheduled date. The designer must be present at the review.*

REQUESTED FAX. *Information requested to be faxed to Safety & Buildings staff must include the project plan number and be addressed to the specific plan reviewer. It would also be beneficial to follow-up your fax with a phone call to the reviewer.*

UNSOLICITED FAXES *will be processed similar to mail received. It will not be treated on a priority basis. Faxed requests for preliminary review decisions must be accompanied with the information listed in blocks 1-4 of the SB-118 from:*

PLAN EXAMINER/SUBMITTER DISAGREEMENTS. *Hopefully this does not occur. However, if it does, please call and talk to the plan examiner first, explain your position and listen to the examiner's. Try to work out a solution to the problem. If agreement cannot be reached with the examiner, call the examiner's supervisor. If the problem is still unresolved, call Randy Baldwin, (608) 267-9152, the plan review bureau director. A similar organization exists for inspection issues. First talk to the inspector, then the regional supervisor, then Bennette Burks (608) 266-0056, inspection bureau director. If the disagreement is still not resolved a petition for variance may be submitted to utilize an alternate to a code requirement or a request for reconsideration of application of an unclear code provision may be submitted to the Bureau of Program Development.*

SUBMITTAL GUIDELINES FOR MULTIPLE TENANT BUILDINGS

*I. Plans for the shells of buildings whose volume is greater than 50,000 cubic feet shall be submitted to a state plan review office (Hayward, La Crosse, Madison, Shawano, Green Bay or Waukesha) rather than a certified municipality.**

II. Alterations to a space which affects other tenant's exiting, sanitary facilities, etc., are considered to affect the entire building and thus are required to be submitted to a state plan review office if the building volume is greater than 100,000 cubic feet.

III. Other alterations, including the initial tenant development, involving spaces less than 100,000 cubic feet in volume may be submitted to a state plan review office or to a certified municipality.

IV. If plans are to be submitted to the state, ***it is strongly recommended that the leasing coordinator direct all plan submittals to a single office*** *for the following reasons:*

a. The designated reviewer will be familiar with the entire project.

b. A better quality of review can be done due to the reviewer's overview of effects of the alteration on the entire building.

c. Complete file and former plans would be available for pertinent project history and alteration coordination.

d. Less duplication of submitted materials will be needed.

e. Time delays due to transporting files and former plans between state offices will be eliminated.

f. A detailed key plan and indication of past variances or pertinent conditions of approval will not have to be submitted with each individual tenant alteration.

g. Several tenant plans can be submitted simultaneously or within a short time frame without plan review delays needed to correlate effects of one submittal on another.

** The Cities of Madison, Milwaukee and Janesville are authorized to review plans for buildings whose volume is greater than 50,000 cubic feet.*

*** Unless otherwise informed by the owner or leasing agent, the state office reviewing the building shell will be considered the primary office for tenant space review.*

***COMM 70, HISTORIC BUILDING CODE**. Many people seem to be under the misconception that if a building is listed as an historic building it must be reviewed under the provisions of COMM 70 to maintain that listing. This is not true. Listed historic buildings are required to comply with **one** of the following: The current code; the code in effect at the time the building took its present occupancy; the Existing Building Code, Comm 75-78, if the occupancy of the building has not changed since 1914; or COMM 70. In most cases, if the occupancy of the building is not changing, the code in effect at the time of present occupancy or Comm 75-78 is the easiest code to meet.*

***ALTERATION AND ADDITION SUBMITTALS**. State plan reviewers typically do not have access now to prior approved plans or correspondence for existing buildings. Therefore, it is critical that the designer provide the following information for the existing building when submitting alteration and addition plans: occupancy, number of stories, class of construction, sprinklering, fire division walls, roof elevations, exits, accessible path of travel, petition of variance history.*

Existing conditions may be presented in schematic format. Failure to provide this information may delay approval of plans. In researching these items, be aware that the Division of Safety & Buildings has limited building records, while the State Historical Society at (608)266-6460 has some older records.

***Master Plan Approvals**: The Safety and Buildings Division will do pre-approvals of building, plans, including lighting and HVAC if desired, which designers plan on using on a repeat basis at various locations during a current code revision cycle. Pre-approval of a master plan may result in savings on plan review fees, and avoid delays caused by withholding of approval for projects due to code violations indicated on plans submitted.*

Plans submitted for master plan approval must be submitted to the Madison office due to the availability of review staff in that office. Projects involving a pre-approved master plan may be submitted to any state office(s) requested by the Master Plan submitter at the time of Master Plan approval, or, subject to limitations, to certified municipalities for final review and approval.

The master plan approval will cover the building, and if desired, the lighting and HVAC for the building. The master plan approval will include the building above the top of the foundation, or top of the basement/ground floor walls, whichever is higher, to the roof surface, and everything bounded by the exterior surface of the enclosing walls. It will not include foundations, basement/ground floor walls, basement/ground floor framing, or exterior attachments to the building such as stoops and steps, which will be reviewed at the time of project submittal. Decks and porches will be included if shown on the master plan, and are constructed each time the master plan is used for a project.

Master plan approval is intended to apply only to individual building designs, and will not be issued for a site development. Developers designing a multi-building site, and wishing confirmation regarding building locations, roads, streets, etc., should arrange for a preliminary review of the project.

For additional information on Master Plan Approvals, contact Clyde Bryant at (608) 266-1835

COMM 50.12 PLAN EXAMINATION AND APPROVAL

(1) **TYPES OF BUILDINGS.** Plans and specifications for all buildings and structures in the following classifications shall be submitted to the department or its authorized representative, as provided in s. COMM 50.21, for examination and approved before commencing work:

Be aware that building construction features are also found in COMM 10, Flammable and Combustible Liquids Code; COMM 18, Elevator Code, and similar building system codes. The building designer should pay particular attention to the possibility of more restrictive construction requirements.

If the building will be in an unsewered area, a sanitary permit as per COMM 83.055 is required before a local building permit may be issued. The intent of the rule is to ensure that a septic system site has been identified to serve the structure and that this site is protected during the construction of the structure.

Note 1: See the scope of the occupancy chapters for examples of specific types of buildings covered in pars. (a) through (f).

Note 2: Section 101.12 (3) (h), Stats., prohibits local issuance of permits or licenses for construction or use of public buildings or places of employment until drawings and calculations have been examined and approved by the department.

(a) *Factories, office and mercantile buildings (ch. COMM 54).*

1. Except for public mausoleums, department examination and approval for factories, office and mercantile buildings containing less than 25,000 cubic feet total volume is waived; however, the buildings shall comply with the applicable requirements of this code.

***Question**: Previously, prior to the February 1, 1994, creation of COMM 62.995, mini-warehouse buildings which were less than 25,000 cubic feet in total volume did not require plan submittal. Do these small mini-storage buildings now require submittal?*

***Answer**: No, Safety & Buildings plan review for COMM 62.995 mini-storage buildings containing less than 25,000 cubic feet total volume is waived; however, the building shall comply with the applicable requirements of COMM 50-64.*

2. Upon written request, the department may conduct an examination of preliminary mausoleum plans for compliance with the provisions of this code. Results of this examination will be in writing. A fee may be charged for this type of examination. Complete plans and specifications shall be submitted in accordance with sub. (5) prior to construction.

In response to 1989 Wisconsin Act 307, this code requires plan review and approval of public mausoleums and crematoriums as well as Department or authorized agent inspection of public mausoleums and crematoriums within 30 days of notification by the cemetery authority. The code establishes minimum construction standards for public mausoleums, mausoleum spaces and crematoriums. In addition to code requirements, mausoleum spaces must meet requirements considered as standard practice throughout this industry. A public mausoleum does not include a private, family-owned mausoleum which is unavailable to the general public.

(b) *Theaters and assembly halls (ch. COMM 55).*

(c) *Schools and other places of instruction (ch. COMM 56).*

(d) *Apartment buildings that exceed 60 feet in height or 6 stories, hotels and places of abode (ch. COMM 57).*

(e) *Health care facilities and places of detention (ch. COMM 58).* Plans shall be submitted for double-celling in existing places of detention only where other alterations are being made that affect exiting, natural lighting, fire hazard or structural components. If the increased occupant load does not require physical alteration to the existing structure, plans are not required to be submitted.

(f) *Hazardous Occupancies, ch. COMM 59.*

1. Department examination and approval of plans shall be waived for a hangar accommodating one airplane; however, the building shall conform with the applicable requirements of this code.

2. Department examination and approval shall be waived for a storage garage which is less than 25,000 cubic feet in total volume; however, the building shall comply with the applicable requirements of this code.

An airplane hangar is considered a storage garage. Therefore, plan submittal is waived for a hangar with a volume of less than 25,000 cubic feet regardless of the number of airplanes in it. Likewise, a hangar for a single airplane is not required to be submitted regardless of volume. If the local municipality requires plans to be submitted to them, the signing and sealing requirements of COMM 50.07 still apply.

(g) *Day care facilities (ch. COMM 60).*

(h) *Community-Based Residential Facilities (CBRF) (ch. COMM 61).*

(i) 1. Except as provided in subd. 2, department examination and approval is waived for television and radio transmitting and receiving antennas, outdoor theater screens, water tanks, display signs, observation towers, docks, piers, wharves, tents or inflatable structures used temporarily, and other similar structures; however, these structures and temporary tents shall comply with the applicable structural and other requirements of chs. COMM 50-64.

FIRE SERVICE DRILL TOWERS. *Must fire service drill towers, burn buildings, smoke buildings, and combination structures be submitted for review and approval?. Must these structures comply with all provisions of the code?*

These structures will be considered as "similar structures" under the provisions of COMM 50.12 (1)(i) 1., therefore submission is not required. However, the structure must comply with the applicable requirements of COMM 53, structural provisions; NFPA 1403; OSHA 1910.24 and 1910.30, fixed stairs and ladders; and COMM 32 or OSHA 1910.23, guarding of floor and wall openings and holes.

This interpretation is not intended to limit the discretion of local building officials in applying codes necessary to address concerns related to specific features in the design of these unique structures.

2. a. Plan examination and approval is required for the installation of roof mounted antenna structures exceeding 20 feet in height above the roof, unless the building is otherwise exempt or plan submittal is waived.

b. Plan examination and approval is required for the installation of ground mounted antenna structures exceeding 200 feet in height.

c. Plan examination and approval is required for the installation of ground mounted antenna structures exceeding 50 feet in height if the structure is located nearer to any street, public thoroughfare or property line than the height of the structure measured from the base of the structure nearest to the street, thoroughfare or property line to the highest point of the antenna.

(2) TYPES OF PLAN APPROVAL. The following types of plans shall be submitted to the department or its authorized representative, as provided in s. Comm 50.21, for examination and approval before construction is commenced:

(a) *General building plans.*
(b) *Structural plans.*
(c) 1. Heating and ventilating plans; and
2. Data and information relative to requirements of chs. COMM 63 and 64 for the replacement of a major piece of heating or air conditioning equipment.

The prevailing code applies to the replacement of major heating equipment including, but not limited to, furnaces, air handling units, boilers, and water heaters. This would include the requirement for the preparation of plans so as to submit and gain approval. The Safety and Buildings Division has developed a process by which, when a narrow set of criteria are met, a letter can be submitted for approval, in lieu of plans.

BOILER, FURNACE, OR CENTRAL AIR CONDITIONER REPLACEMENT. *Replacement of equipment means no changes to existing ductwork or piping are permitted other than those necessary to fit the new equipment to the existing system. If changes to the ductwork and piping go beyond this, HVAC alteration plans must be submitted in accordance with COMM 50.12. Replacement does not cover increasing equipment sizes or capacities to accommodate building alterations or additions.*

When a replacement of boiler or furnace is made (unless the new equipment is electric, direct –vent sealed combustion chamber appliance, or suspended if permitted), a fire resistive rated enclosure is required to exist.

The existing "furnace room" need only be in compliance with the code that was in effect at the time of the last approval. Following are some of the older enclosure requirements.

1. *Buildings constructed prior to 1914 require a two-hour floor, one-hour walls and ceiling.*
2. *Buildings constructed during 1914 through 1930 do not require a rated enclosure for a low pressure boiler. Furnaces and other hazards require a one-hour enclosure.*
3. *Buildings constructed after 1930 but before April 1, 1997:*
   Chapter 54 Buildings: *2 hour fire-resistive enclosure, except buildings not more than 2 stories in height and having a floor area of not more than 3,000 square feet per floor required a 1-hour fire-resistive enclosure.*
   Chapter 55 Buildings: *3 hour fire-resistive enclosure, except that assembly halls accommodating not more than 300 person require, a 2-hour fire-resistive*
   Chapter 56 Buildings: *4 hour fire-resistive enclosure except one-story buildings required a 2-hour fire-resistive enclosure.*
   Chapter 57 Buildings: *2 hour fire-resistive rated enclosure except buildings less than 3 stories in height required a one-hour fire-resistive rated enclosure.*
   Chapter 58 Buildings: *3-hour fire-resistive rated enclosure except buildings less than 3 stories in height required a 2-hour fire-resistive rated enclosure.*
   Chapter 59 Buildings: *2-hour fire-resistive enclosure.*
   Chapter 60 Buildings: *2 hour fire-resistive rated enclosure except buildings less than 3 stories in height required a one-hour fire-resistive rated enclosure.*
   Chapter 62 Open Parking Structures: *2-hour fire-resistive.*
   Chapter 62 Assembly Seating Facilities:*, 2-hour fire-resistive enclosure*
   Chapter 62 Greenhouse *2-hour fire-resistive enclosure except buildings which are not more than 2 stories in height and which have a floor area of not more than 3,000 square feet per floor, required a 1-hour fire resistive.*
4. *Buildings constructed after April 1, 1997 require an enclosure in accordance with present code.*

The following information must be submitted and approved prior to the replacement of the equipment:

a. A completed SBD-118 plan review application form. Call (608) 266-3151 if a form is needed.

b. A fee of $80.00 per building.

c. At least four copies of a letter. The letter shall: identify the building by address, occupancy, and owner; identify the name and address of the HVAC contractor or designer responsible for making the replacement; give the make, model and BTU output of the equipment being replaced; give the make, model and BTU output of the replacement equipment. . UL, AGA, PFS or other recognized laboratory approval shall be specified

d. If the BTU output of the replacement equipment is less than that of the equipment being replaced, HVAC heat loss calculations must be submitted proving the adequacy and code compliance of the smaller unit(s).

e. If the replacement equipment has a BTU output less than that of the equipment being replaced and the building contains more than 50,000 cubic feet total volume, the letters and heat loss calculations must be signed, sealed, and dated by a Wisconsin registered architect, engineer, or HVAC designer. (Involvement of a registered professional is not required if the capacity of the replacement equipment equals or exceeds that of the replaced equipment.)

f. If the new equipment is such that it will require fire rated isolation from the balance of the building where the old equipment did not, evidence of a rated enclosure must be submitted with the application. Typical examples of this type of replacement include changing from electric to gas-fired and from direct-vent sealed combustion chamber gas-fired to traditional gas-fired. Evidence of rated enclosure consists of a letter from an architect, engineer, or certified commercial building inspector stating that an existing rated room is present and giving the fire rating of that room in hours. If the room is not adequate, submission must include the building of a new rated room, per COMM 50.12.

(d) *Alteration plans for existing buildings, except for those alterations involving changes in interior finishes only.*

Question: *Is it necessary to submit plans for a kiosk (a small structure, usually without walls, used for retail purposes constructed in the mall corridor of the shopping center)?*

Answer: *Plans for kiosks constructed such that the display cases enclose a space occupied only by the employees of the kiosk and the public is restricted to only the outside perimeter of the kiosk need not be submitted to this department for review and approval. If the kiosk is constructed such that the public enters into the kiosk space rather than limited to the outside perimeter, alteration plans must be submitted to this department. Local authorities may require state review of any kiosk if in their opinion the kiosk is unusually large or other conditions warrant state review.*

I.N. Question: When a re-roofing project involves changes to parapet walls, roof curbs, pitch of roof, etc., must the project be evaluated by a registered engineer or architect and must plans be submitted for review?

Answer: The effects of altering roof curbs, roof pitch, parapet walls, and other features which may increase roof dead load, snowdrift load, or drainage load, etc., should be evaluated by a Wisconsin registered engineer or architect.

Due to the varying complexity of these types of projects, the department will rely on the building inspector's judgment to determine if plans are required to be submitted when the evaluation indicates minimal effects due to the alterations. Plans submitted for buildings whose total volume exceeds 50,000 cubic feet are required to be signed and sealed by a Wisconsin registered engineer or architect.

(e) *Revisions to previously examined plans.*

(f) *Industrial exhaust system plans within government-owned buildings.*

Note: See s. COMM 64.54 (3) relating to the types of exhaust ventilation systems requiring plan submittal.

(g) *Spray booth plans (government-owned buildings only).*

Private spray booths are governed by OSHA Standards 1910.107. The Division of Safety & Buildings does not review plans or conduct inspections on these booths.

(h) *Footing and foundation plans (see s. COMM 50.13).*

(i) *Assembly seating facility plans.*

(j) *Fire escape plans.*

(3) PLANS AND SPECIFICATIONS. At least 4 complete bound sets of plans, which are clear, legible and permanent copies, and one copy of specifications shall be submitted for examination and approval before commencing construction. The plans shall be bound in a manner that enables them to be reviewed without removing the binding. The plans and specifications shall contain the following information:

Plans with notations such as "preliminary," "for permit only," "not for construction," etc., will not be accepted for review.

BOUND SETS OF PLANS. *The submitter should arrange the plan sheets into sets and bind them together. Truss plan submittals are the largest violator of this requirement. The 8 1/2 X 11 truss shop drawings must be bound together, and then bound or attached to the framing or erection plans. Binding by means of rubber bands, spring clips or paper clips is not acceptable. Staples, ring binders and ACCO type binders are acceptable. Unbound plans received by the Division of Safety & Buildings will be returned, unprocessed, to the submitter for binding.*

Note: Also see sub. (5)(b) note.

(a) *General.* All plans shall contain the name of the owner and the address of the building. The name and seal of the architect(s), engineer(s) or person(s) who prepared the plans shall appear on the title sheet, in accordance with s. A-E 2.02 (4).

(b) *General building plans.* The general building plans shall include the following:

1. a. Plot plan. The location of the building with respect to property lines and lot lines and adjoining streets, alleys and any other buildings on the same lot or property shall be indicated on the plot plan. For recycling space designated adjacent to a building, as specified in s. COMM 52.24, the area and dimensions shall be indicated on the plot plan. A small scale plot plan shall be submitted on a 8 1/2" x 11" sheet for projects containing multiple buildings. For purposes of this requirement, a plot plan does not have to be a certified survey.

b. The plot plan shall clearly indicate the location of the accessible building, its accessible entrances and the exterior accessible route to, from and between all accessible parking spaces, recreational and public facilities and areas on the site, public transportation stops adjacent to the property, public streets or sidewalks and if provided, passenger loading zones. The plans shall also indicate the size and location of the accessible parking spaces and the gradient or slope information for all walks and ramps on the accessible route.

2. Floor plans. Floor plans shall be provided for each floor. The size and location of all rooms, doors, windows, fire walls, toilet facilities, structural features, exit passageways, exit lights, fire

alarms, standpipes, stairs and other pertinent information, including but not limited to adequate space within a building designated for collection, separation and temporary storage of recyclable materials shall be indicated. Schematic exit plans shall be provided for large buildings, indicating normal paths of egress.

COMM 57.74 requires conformance with accessibility requirements of COMM 57 Subchapter II to be presented as part of the general plan submittals.

3. Elevations. The elevations shall contain information on the exterior appearance of the building and indicate the location and size of doors, windows, roof shape, chimneys, exterior grade, footings and foundation walls, and include information about the exterior materials.

4. Sections and details. Sections and details shall include information to clarify the building design.

Question: *How should fire-resistive assemblies be shown on the plan?*

Answer: *Plans must include the following fire-resistive assembly information:*

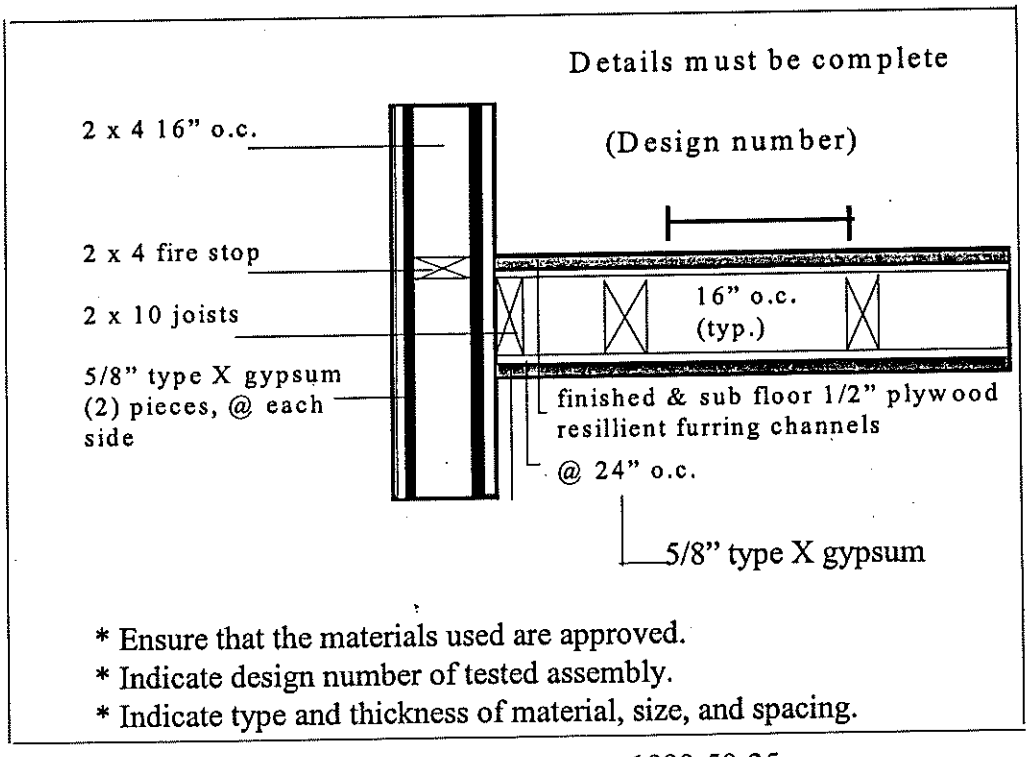
1. ***Location*** *- Fire walls must be indicated on a schematic building plan (i.e., a site plan which also indicates firewall locations) and on the floor plans.*

2. ***Fire-Resistive Rating*** *- The hourly rating of the assembly must be indicated.*

3. ***Design Number of the Tested Assembly*** *- The method of satisfying COMM 51.043 must be indicated. This can be done by indicating the testing laboratory and assembly test number, by indicating COMM 51.045 and row number of typical assembly used, or by indicating that the calculation method was used and supply the calculations.*

4. ***Complete Detailed Section Through the Assembly*** *- Indicate type and thickness of materials, supporting framing size and spacing, firestopping, penetration protection, method of element connections.*

The following diagram is from the commentary.



* Ensure that the materials used are approved.
* Indicate design number of tested assembly.
* Indicate type and thickness of material, size, and spacing.

Structural Component Submittal

(trusses, precast, joist girder, metal buildings)

1. Only one set of plans for components will be required to be submitted to the reviewing office. Any additional sets will not be returned.

2. One copy of the submitted component will be required to be kept at the construction site.

3. When the total building volume exceeds 50,000 cubic feet, each set of plans shall be signed and sealed as per COMM 50.07 and shall bear an indication of review which has been signed or initialed by the building designer of record.

4. The bureau will review a selected number of the component plans submitted within 15 days of receipt. Submitters will be informed of the results of any review done or submitters will be informed if a review has not been done.

The bureau reserves the right to formally review the plans in the future if the department determines that such a review is warranted, and to order corrective actions with respect to the outcome of that review.

5. Interior barrier-free design information. The general building floor plans, elevations and sections shall clearly show the following:

a. All accessible routes through accessible buildings, facilities, tenant spaces and living units.

b. The design and location of all interior and exterior ramps, including the gradient or slope information.

c. The areas of rescue assistance in multilevel buildings, including dimensions of the area and the fire resistive construction details.

d. The type and location of elevator or mechanical lifting equipment and, where applicable, the design and construction of the vertical shaft.

e. The design of bathrooms, toilet rooms, and unisex toilet rooms, including door clearances, lavatory or vanity design, plumbing fixture mounting heights, turnaround spaces, clear spaces required for plumbing fixtures, the size and arrangement of toilet compartments and other toilet room equipment such as, but not limited to, mirrors, soap dispensers and hand dryers.

(c) *Heating, ventilating and air conditioning plans.* Heating, ventilating and air conditioning plans shall indicate the layout of the system, including location of equipment and size of all piping, ductwork, dampers (including fire dampers), chimneys, vents and controls. The quantity of outside air introduced to each zone, and the quantity of supply air and exhaust air for each room shall be listed on the plans. The type of equipment and capacity (including the input and output) shall be indicated on the plans or equipment schedules, unless indicated in the specifications. Justification for the number of persons used as the basis for the HVAC system design shall be provided when required by s. COMM 64.05 (5).

HVAC plans which utilize suspension of equipment to satisfy isolation of hazards must also include a typical elevation indicating distance of equipment to the floor and ceiling or roof.

(d) *Specialty plans.* Specialty plans for spray booths, special exhaust systems, assembly seating facilities, fire escapes and special structural systems shall include pertinent information with respect to the design and construction of the specialty.

(e) *Specifications.* The specifications shall be properly identified with the drawings and describe the quality of the materials and the workmanship.

(f) *Schedules.* Schedules shall be provided which contain information pertinent to doors, room finishes, equipment, and the use of all rooms and the number of occupants accommodated therein, unless this information is indicated on the plans.

Note 1: Original drawings are not considered a substitute for permanent prints.

Note 2: Duplicate information need not be submitted when heating, ventilating, air conditioning and building plans are submitted simultaneously.

Note 3: For pit depth and overhead clearance requirements applicable to design of elevator hoistway, see ch. COMM 18, Elevator Code.

Note 4: Plans for swimming pool installations are examined by the department.

(4) DATA REQUIRED. All plans submitted for approval shall be accompanied by sufficient data and information for the department to judge if the design of the building, the capacity of the equipment, and the performance of the system will meet the requirements of this code. The following data shall be submitted:

(a) *Structural data.* Sample structural calculations, including assumed bearing value of soil, live loads and itemized dead loads, unit stresses for structural materials, typical calculations for slabs, beams, girders, columns and trusses shall be submitted. Typical wind and bracing calculations and diagrams including the manner in which shear transfer is made between resisting elements shall also be included. Complete structural calculations shall be furnished upon request of the department or other authorized approving official.

1. The building designer shall submit the following minimum information for structural components such as but not limited to wood trusses, precast concrete, laminated wood members, steel joists and steel girders when the component fabricator is specified as being responsible for the component design:

a. Structural framing plan;

b. Bearing support and connection details of the component to the structure;

Question: *Do truss-to-truss and truss-to-frame connections need to be specified on plans? If submittal is required, should connection selection be specified on the building plans or the truss plans?*

Answer: Connector selection is required to be submitted *and may be indicated on either the framing plan or erection plan.*

c. Design loads, including location and magnitude of: uniform superimposed dead and live loads; concentrated dead and live loads; nonuniform snow loads; wind and bracing loads for component system; and wind, bracing and gravity forces required to be developed at interfaces with other materials;

Question: *Must design loads be shown on the building plans? If so, what type of loading must be shown?*

Answer: Design loads and location of special loading conditions must be shown on the plan.

This should be included on the initial plan submittal (including foundation only plans and permissions to start).

Projects are built from the ground up; however design loads must be incorporated from the top down. Thus prior to footing design, the roof and floor loads and their method of transfer to the foundation must be known.

Special loading conditions need to be clearly called out as to the location and the amount of loading. Examples of these special loading conditions include but are not limited to church steeples, mechanical

units, snow drift, sliding partition walls, and shear walls. Plans should clearly identify how these loads are to be transmitted down to the foundation.

The intent of this requirement is to ensure thorough structural design before proceeding with construction and to convey this information to the contractor, any component suppliers, and the plan reviewer and the building inspector.

d. Required fire rating;

e. Outside configuration of components; and

f. Permanent bracing system.

2. The building designer shall also submit the following information with the initial building plan submittal or the component plan submittal:

Question: *What are the criteria to decide if bleacher plan submittals are components or miscellaneous plans?*

Answer: *Bleacher plans submitted as part of an active building and HVAC project may be submitted prior to occupancy of the building via the building designer as a component requiring no additional fees.*

Bleacher plans submitted as independent projects or submitted after the building and HVAC project compliance statement has been filed are considered miscellaneous plans requiring a $250 fee and completed SB-118 application form with original signatures.

a. A framing plan showing all members and labels and special installation (e.g., handling and erection) instructions and any required permanent bracing required which was the basis for the component design;

b. Information regarding the member design of the following structural components: Web configuration, stress diagram or tabulation of axial force in the members, member size, grade of lumber, fabricated splices and member bracing for wood trusses; web configuration, stress diagram or tabulation of axial force in the members, member size, steel yield, fabricated splices and member bracing for steel joists and joist girders subjected to nonuniform loading; specified concrete strengths, prestressing data including final effective forces and centroids, mild reinforcing including release and confinement steel, shear reinforcing, and stripping, transportation and erection handling points for precast concrete members; species of wood, bending stress of wood, adhesive and member sizes for laminated wood members; and

c. Information pertaining to the design of connections within or between like components for the following structural components: Web and chord connection details and connector plate holding values for wood trusses; web and chord connection details for steel joist and joist girders subjected to nonuniform loading; bearing confinement steel, dapped end reinforcing, corbel reinforcing, bearing pads, and loose and embedded connection steel including welding and bolting requirements for precast concrete members; member connection and bearing details for laminated wood members.

3. For the purposes of this paragraph, the department does not consider truss layout plans or truss erection plans as architectural practice or engineering practice, and therefore, such plans are not required to be signed and sealed or stamped in accordance with s. COMM 50.07 or 50.08.

4. Information regarding reinforcement, concrete strength, fire resistive ratings for precast concrete components may be provided in either the specifications or calculations furnished with the precast concrete plans.

CALCULATIONS. *The code requires that you submit only thermal performance, heat loss and structural calculations. When reviewing large and/or complicated buildings the plan reviewer must calculate capacity, aggregate exit width and sanitary fixture counts. We're sure that the designer has made these calculations during the design phase in order to size exits, stairs and toilet rooms. It would be extremely helpful to our review staff if copies of design calculations were submitted with plans even though the code does not require them.*

Dept. of Commerce Truss Fabricator Certification, s. COMM 50.12 (4)(a) 2.

Truss fabricator certification is available (see sample application forms in Design and Submittal Supplement). In lieu of the submittal of complete design calculations for each truss project, an industrial truss fabricator or manufacturer may apply to the department for certification.

This certification will require that the truss fabricator:

1. Secure an approved third-party independent inspection agency to conduct periodic inspections of the truss fabrication.

2. Submit to the department quarterly reports of the third-party inspection results and complete drawings and calculations for the third-party inspected trusses.

Truss plan submission from certified truss fabricators will not be required to include truss component calculations unless specifically requested by the plan reviewer.

The submittal shall consist of the following:

1. Completed application form.

2. At least four sets of truss component drawings including the following:

- *a. Drawing/sketch of the truss showing:*
  - *1) Geometry*
  - *2) Span and spacing*
  - *3) Pitch*
  - *4) Web configuration*
  - *5) Chord configuration*
- *b. Plate sizes required and locations.*
- *c. Truss design loadings, including any specific load conditions.*
- *d. Bearing locations.*
- *e. Minimum bearing required or if any enhancements are required.*
- *f. Lumber species and grade required for all members.*
- *g. Web bracing requirements.*
- *h. Chord bracing requirements.*
- *i. Plate type.*
- *j. Plate Wisconsin Building Material approval number.*
- *k. Bearing reactions.*
- *l. Load duration factors.*
- *m. Specific editions of the COMM 51.25 standards utilized in the truss design.*

n. The particular job that the truss pertains to.

o. Any other pertinent information.

p. Wisconsin registered architect or engineer signature and seal on drawing.

q. Truss fabricator certification number.

r. Engineer or architect signature and seal in compliance with Administrative Code A-E 2.02. The signature and seal may be on a truss component index sheet or on each drawing.

Be aware, signed and sealed framing plans required as per COMM 50.07 (2) shall be submitted with the building plans. Erection plans reflecting this framing plan may be signed and sealed or, if not changed, may be signed by an engineer or architect and stamped with a notation that he or she has reviewed the plans. Truss connection details may be indicated on either the framing plan or erection plan.

Building plans submitted for approval shall itemize all loads and load path to foundation in accordance with COMM 50.12. The department or authorized agent may at any time request additional calculations to determine code compliance.

(b) *Energy conservation data.* Calculations and specifications shall be submitted in accordance with s. COMM 63.01 for the types of projects outlined in s. COMM 63.001 on forms provided by the department or other forms approved by the department.

Note: See A50.12 of the appendix for sample copies of forms.

Building envelope criteria are part of the building design; therefore it must be submitted with the building plans if the building is to be heated.

COMM 63 has been completely rewritten and the new COMM 63 became effective April 1, 1997. As compliance with the provisions of the new COMM 63 depends to a considerable degree upon the architectural design of the building, complete calculations and other data showing compliance with the provisions of the new COMM 63 must be submitted with the building plans for all projects submitted on or after April 1, 1997.

(c) *Heating and ventilating data.* A description of the construction for the walls, floors, ceilings and roof, and the transmission coefficients of the construction materials shall be furnished. The calculations shall include heat losses for the individual rooms (including transmission and infiltration and/or ventilation losses, whichever are greater), a summary of the total building heat loss expressed in Btu/hour or watts, heat gain calculations for air conditioning systems, ventilation calculations including outside air requirements for each space and ventilation system expressed in cubic feet per minute or liters per second, and percent of outside air at maximum and minimum flow rates when the building is occupied.

Note: If the code does not specify a required calculation method, the department will accept as the basis for calculations and design data, the methods and standards recommended by the Mechanical Contractors' Association of America; the American Society of Heating, Refrigerating and Air Conditioning Engineers; and the Institute of Boiler and Radiator Manufacturers.

(d) *Data for recycling space.* Verifiable data or calculations and specifications shall be submitted in accordance with s. COMM 52.24 for determining adequate space for the separation, temporary storage and collection of recyclable materials, unless the space designated is based on the requirements identified in this code.

(dm) *Elevator and mechanical lift data.* Where an elevator, limited-use elevator, residential elevator, vertical wheelchair lift, inclined wheelchair lift, stairway chairlift or other mechanical

lifting device is to be installed in a public building or place of employment, the following information shall be included on the building plans and submitted to the department for review:

1. Size of cabs or platforms for elevators, limited-use elevators, residential elevators and wheelchair platform lifts.

Note: See chs. Comm 18 and COMM 69 for the minimum cab and platform sizes.

2. Rating and construction of vertical shafts for elevators, limited-use elevators, residential elevators and vertical wheelchair lifts.
3. Door clearances to elevators, limited-use elevators, residential elevators and vertical wheelchair lifts.
4. Maneuverability clearances at elevators, limited-use elevators, residential elevators and wheelchair platform lifts.

Note: See chs. Comm 18 and COMM 69 for maneuverability clearances at doors.

5. The accessible route to the methods of vertical circulation provided in a building or facility.
6. Location and width of all exits and stairways in a building or facility when an inclined wheelchair platform lift or stairway chairlift is installed. The mechanical lifting devices in their operational position shall not infringe into the minimum exit width required for the building or facility.

Note: The minimum exit width required for a building or facility is based on the capacity of the building or facility. See the applicable sections of chs. COMM 50 to 64 for determining the capacity and exit width.

(e) *Additional data.* When requested, additional data pertaining to design, construction, materials and equipment shall be submitted to the department for approval.

INSTALLATION OF VERTICAL TRANSPORTATION IN EXISTING BUILDINGS WHERE NO ALTERATIONS OR ADDITIONS ARE INVOLVED. *The minimum submittal requirements for the installation of vertical transportation involving no building alteration or addition are:*

1. Completed SBD-118 application form.

2. $80.00 review fee.

3. Schematic floor plan of the existing entry and accessibility features.

4. Details of the size and fire-resistance features of the shaft and equipment room enclosures.

5. Details of the accessibility features associated with the accessible route to the vertical transportation such as doors, ramps, landings, handrails, etc.

6. Aggregate exit width calculations if any vertical transportation infringes on existing stairways and exit passageways.

7. If the building contains more than 50,000 cubic feet total volume, the plans and documents related to items 4 through 6 above shall be signed, sealed, and dated by a Wisconsin registered architect or engineer. The schematic floor plan required by Item 3 above shall be either signed, sealed, and dated, or attach a signed, sealed, and dated cover sheet indicating that the schematic floor plan is a true representation of the existing conditions.

8. A compliance statement per COMM 50.10(3) shall be filed by the registered supervising professional after installation of the vertical transportation device.

(5) APPLICATION FOR APPROVAL. A plans approval application form shall be included with the plans submitted to the department for examination and approval. The department shall review and make a determination on an application for plan review within 15 business days of receipt of the

application and all forms, fees, plans and documents required to complete the review as specified in s. COMM 2.07 (3).

APPOINTMENT FOR REVIEW. *Submitters of plans should contact the reviewing office prior to the submittal of the plans to arrange a review date for the plans. Plans received without prior contact and arrangement of a review date will be assigned a review date upon receipt.*

APPLICATION FORM, SBD-118. *This simplified form has been revised by a team of engineers, architects, contractors, and Safety & Buildings staff to obtain information necessary to a) link the project with existing files and create a project history; b) review the plan; c) establish responsible parties; and d) serve as a reminder to submitters that design for items covered in other than COMM 50-64 may be necessary. Failure to complete all areas of this form may result in delays due to plans being held for processing until information is obtained*

Complete for confirmed appointments*:

Transaction ID: _____

Previous Related Trans. ID: _____

Appointment Date*: _____

Assigned Reviewer: _____

Assigned Office: _____

***Plans must be received in the office of the appointment no later than 2 working days before the confirmed appointment.**

This box, located at the top center of the form is the most critical item in the submitter's perspective. The current system allows submitters to call ahead to reserve appointments for plan review. The scheduling may be done prior to completion of plans by the designer, thus allowing a one- to two-day turnaround time if the submitter properly organizes his/her schedule. Due to the number of appointments made, plan entry does not have time to manually check each plan against an appointment list, thus scheduling information is assigned to be inserted into this box as a reference. ***It is extremely important to insert the scheduling information into this box if you have scheduled a review.*** *Applications submitted with this information receive priority attention. Applications without reservation information are processed separately and are scheduled for the next available review time which may be a maximum of 15 working days from receipt.*

You may now chose from the four following options to schedule a plan review with the Safety & Building Division. First fill out the first page of the following Application for review. Contact information is on the second page.

PHONE: *As always you can call a full service office during our business hours and schedule a plan review with one of our scheduling staff.*

FAX: *Many of our customers have found faxing to be a convenient option to phone scheduling. Fax us your completed first page of the application (day or night) and we will fax back a transaction number and a plan review appointment date.*

VOICE MAIL: *If you prefer, you may call voice-mail direct in Madison and leave a message (day or night). Submit the needed information from the first page and we will call you back with a transaction number and a plan review appointment date. Madison is the only office with a dedicated voice-mail*

number. ***Dial 608/266-3151, press option #1, then press #2 (no need to wait for voice prompts just press #1 then #2).***

E- MAIL: *This is our most recent additional choice. If you or your company has access to the Internet you can use it to schedule a plan review. We will reply by e-mail with a transaction number and plan review appointment date. Please remember to include all the information that is requested on the first page of the application.*

Wisconsin Department of Commerce

APPLICATION FOR REVIEW
-Complete all pages-

BUILDINGS, HVAC AND COMPONENTS

Safety & Buildings Division
Bureau of Integrated Services

This page may be utilized for fax appointments
Complete and indicate date plans will be in our office _____

NOTE: Personal information you provide may be used for secondary purposes [Privacy Law s. 15.04(1)(m), Stats.]

1. Building Submittal Type:
( ) Building
( ) HVAC
( ) Lighting
( ) Footing Foundation
( ) Permission to Start
( ) Truss
( ) Precast
( ) Metal Building
( ) Erosion Control
( ) Other
Occupancy: _____
Area (project area, include all levels): _____ sq. ft.
Number of floor levels _____
# of Stories: _____
Construction Class
☐ 1 ☐ 2 ☐ 3 ☐ 4
☐ 5A ☐ 5B ☐ 6 ☐ 7 ☐ 8
Total Building Volume is:
( ) < 50,000 Cu. Ft.
( ) ≥ 50.000 Cu. Ft.

2. Type of Submittal:
( ) New ( ) Addition
( ) Revision/Replacement
( ) Alteration, If tenant alteration indicate previous designation
_____
( ) Petition (attach form SBD-9890)
( ) Multiple Buildings
Number of Buildings _____
Complete attached form for multiple buildings on the same site

Complete for confirmed appointments*:
Transaction ID: _____
Previous Related Trans. ID: _____
Appointment Date*: _____
Assigned Reviewer: _____
Assigned Office: _____
***Plans must be received in the office of the appointment no later than 2 working days before the confirmed appointment.**

3. Project Site Information - Fill in all known information.
Site Number _____
Number & Street: _____
Legal Description: _____
County _____ ( ) City ( ) Village ( ) Town of _____
Facility Name: (tenant name or building designation: Example: West Mall/Jim's Shoes)
Facility Address: (tenant or building address) **Zip Code**

4. After plans are reviewed, please: (check all that apply)
___ Call when completed.
___ Requesting party will pick up.
___ Mail plans to customer 1, 2, 3, 4. Circle customer number from below.
Other: _____

5. Complete the following designer/owner/requesting information. Utilize the check boxes when designer, owner or requesting party is the same to avoid repeating information.

Designer Information (Customer 1)
First Name Last Name Customer Number
Company Name
Address
City State Zip+4 (9 digits)
Phone Number (area code) Fax or Internet
Check others if applicable
( ) Owner ( ) Payer ( ) Supervising Professional

Owner Information (Customer 2)
First Name Last Name
Company Name
Address
City State Zip+4 (9 digits)
Phone Number (area code) Fax or Internet
Check others if applicable
( ) Payer ( ) Supervising Professional

Requesting Party if different than designer (Customer 3)
First Name Last Name Customer Number
Company Name
Address
City State Zip+4 (9 digits)
Phone Number (area code) Fax or Internet
Check others if applicable
( ) Owner ( ) Payer ( ) Supervising Professional

Other Please specify (Customer 4)
First Name Last Name
Company Name
Address
City State Zip+4 (9 digits)
Phone Number (area code) Fax or Internet
Check others if applicable
( ) Payer ( ) Supervising Professional ( ) Other

MAKE CHECKS PAYABLE TO DEPT. OF COMMERCE
Attach check here.

TOTAL AMOUNT DUE $ _____
Review Code 7648

6. Regulated Object Type Details Complete information requested where applicable.

Building

Occupancy Type
(check all that apply)
( ) Assembly (Entertainment, Dining, Worship)
( ) Business/Office
( ) Educational
( ) Factory/Industrial
( ) Mercantile/Retail
( ) Hazardous/Garage
( ) Residential ≤ 8 units
( ) Residential > 8 units
( ) Institutional/Daycare/CBRF
( ) Free Standing Canopy
( ) Grandstand
( ) Open Parking Structure
( ) Mini-Storage
( ) Warehouse/Storage

Fire Containment
(check all that apply)
( ) Unlimited Area
( ) Flammable or Combustible Liquids
( ) Required Area Division Walls

Facility Regulated by Other Agency
(check all that apply)
( ) CBRF ( ) Hospital
( ) Nursing Home ( ) Day Care
( ) Assisted Living
( ) Hotel/Motel/Restaurant
( ) Public Swimming Pool
( ) Other
( ) **None**

Sprinklered Type
( ) Partial ( ) Complete ( ) None
( ) NFPA 13
( ) NFPA 13R
( ) NFPA 231
( ) NFPA 231C

Component Included with this submittal
(check all that apply):
( ) Precast Concrete
( ) Wood Truss
( ) Steel Joist Girder
( ) Metal Building
( ) Laminated Wood
( ) Fire Escape
( ) Interior Bleacher

HVAC

Submittal Includes,
(check all that apply)
( ) Grease/Range Hood
( ) VAV System
( ) Boilers
( ) Seasonal Use
Dates
From _____ to _____
( ) Plenum Ceiling
( ) Mechanical Refrigeration
Over 50 Tons

HVAC Fuel Source
( ) Oil/LPG ( ) Solid
( ) Gas ( ) Electrical

Erosion Control

Disturbed Area: _____ acres.

Lighting

Light Load in KW _____

Lighting Controls
(check all that apply)
( ) Day Lighting
( ) Shut Off
( ) Light Reduction
( ) None

NOTE:
HVAC, lighting, and tenant alteration plans and component submittals must be sent to the same office as the original building submittal. Please include the original building transaction number on the second line of the page 1, upper right box.

7. Statements of (Owner's, Designer's and Supervising Professional's Signatures required below)

a) **OWNERS** I request that plans be reviewed for compliance with the code requirements set forth in Chs. Comm 50-64, 66, and 69 of the department. I recognize that I am responsible for compliance with all the code requirements and any conditions of approval. If this building exceeds 50,000 cubic feet in total volume, I will retain as required by s. Comm 50.10, a supervising professional through out construction to project completion and the filing of a Compliance Statement by the supervising professional prior to occupancy.

Permission to start requested (Optional if selected - Be sure to check box under Building Submittal Type on front page)
( ) As the owner, I request to begin footing and foundation work PRIOR to plan review approval. I agree to make any changes required after plans have been reviewed, and to remove or replace any non-code complying construction.
(Additional $80.00 Fee per building). Request is for the following buildings: _____

Owner's Signature _____ Date _____

b) **DESIGNERS** (Comm 50.07-50.09) If this building, following construction of this project, contains more that 50,000 cubic feet in total volume, plans are required to be prepared, signed, sealed and dated by a Wisconsin registered engineer or architect [Comm 50.07(2)]. Signatures and seals shall be original. I certify that the submitted plans were prepared under my supervision, are accurate, and to the best of my knowledge comply with the applicable codes of the Division of Safety & Buildings.

Designer's Signature _____ Date _____

c) **SUPERVISING PROFESSIONALS** (Comm 50.10) I have been retained by the owner as the supervising professional per Comm 50.10 for the performance of the supervision of reasonable on-the-site observations to determine if the construction is in substantial compliance with the approved plans and specifications. Upon completion of construction, I will file a written statement with the department certifying that, to the best of my knowledge and belief, construction has or has not been performed in substantial compliance with the approved plans and specifications.

Supervising Professional's Signature _____ Date _____

d) **COMPONENT SUBMITTAL** The department expects, and requires that the project designer review individual component submittals for compliance with the general design concept. The project designer, and department, will rely on the seal of the component designers for compliance with the codes as they apply to their designs.

Original Signature of Building Designer (Component Submittal) _____ Date Signed _____ Name of Component Fabricator

Madison S&BD	Hayward S&BD	LaCrosse S&BD	Shawano S&BD	Green Bay S&BD	Waukesha S&BD
201 W Washington Ave PO Box 7162 Madison WI 53707-7162 608-266-3151 Fax: 608-261-6699 TDD 608-264-8777 Email: madisonsch@commerce.state.wi.us	15837 USH 63 Hayward WI 54843 715-634-4870 Fax: 715-634-5150 Email: haywardsch@commerce.state.wi.us	2226 Rose St LaCrosse WI 54603 608-785-9334 Fax: 608-785-9330 Email: lacrossesch@commerce.state.wi.us	1340 E Green Bay Shawano WI 54166 715-524-3626 Fax: 715-524-3633 Email: shawanosch@commerce.state.wi.us	2331 San Luis Place Green Bay, WI 54304 920-492-5601 FAX: 920-492-5604 Email: greenbaysch@commerce.state.wi.us	401 Pilot Court Waukesha WI 53188 414-548-8600 Fax: 414-548-8614 Email: waukeshasch@commerce.state.wi.us

8. Certified Agent Municipalities Authorized by the State to Conduct Plan Review

Per s. **Comm** 50.21, the following municipalities have been certified to review plans for new buildings containing less than 5,000 sq. ft., total area; additions to existing buildings where the total area after construction of the addition is less than 5,000 sq. ft.; and alterations to existing buildings where the area of altered space is less than 10,000 sq.ft. If your project is located within the limits of a listed municipality, and meets the size criteria, then contact the municipality involved. **Municipalities marked with an asterisk (*) have been authorized to review plans without limit on size of project or building.** For information regarding the current status of a municipality, call 608-267-7586. Municipalities in [brackets] have been authorized to do inspections only, therefore submit plans to the state, using the reduced certified municipality fee schedule.

COUNTIES

Eau Claire

TOWNS (County Location)

Berry (Dane)
Bloomfield (Walworth)
Bristol (Kenosha)
Cottage Grove (Dane)
Delavan (Walworth)
Farmington (Polk)
Geneva (Walworth)
Grand Chute (Outagamie)
Grand Rapids (Wood)
Hull (Portage)
LaGrange (Walworth)
Linn (Walworth)
[Lyons (Walworth)]
Mukwonago (Waukesha)
Norway (Racine)
[Oakland (Jefferson)]
Ottawa (Waukesha)
[Pleasant Springs (Dane)]
Plover (Portage)
[Rochester (Racine)]
Seymour (Eau Claire)
Sugar Creek (Walworth)
[Summitt (Waukesha)]
Theresa (Dodge)
Waterford (Racine)
Waukesha (Waukesha)
Wheatland (Kenosha)
Windsor (Dane)

CITIES & VILLAGES

Altoona
Antigo
Appleton
Augusta
Beloit
Berlin
Big Bend
Black River Falls
Brookfield
Burlington
[Cambridge]
Cedarburg
Cudahy
Delafield
Dousman
Dresser
Eau Claire
Elkhorn
Elm Grove
Fall Creek
Fitchburg
Fond du Lac
Fontana
Fort Atkinson
Franklin
Fredonia
Glendale
Grafton
Green Bay
Greenfield
Hartland
Hortonville
Howard
Janesville*
Jackson
Johnson Creek
Kaukauna
Kenosha
La Crosse
Lake Geneva
Lannon
Madison*
Marshfield
Mequon
Middleton
Milwaukee*
Monroe
Muskego
New Berlin
New Richmond
Oak Creek
Oconomowoc
Omro
Osceola
Oshkosh
Osseo
Paddock Lake
Plover
Port Edwards
Racine
Rhinelander
Ripon
Rochester
Seymour
Sheboygan
Silver Lake
Stevens Point
Sturgeon Bay
Sun Prairie
Superior
Sussex
Twin Lakes
Walworth
Waterford
Waukesha
Waunakee
Waupun
Wausau
Wauwatosa
West Allis
West Bend
West Milwaukee
Weyauwega
Whitefish Bay
Wis. Rapids

9. Fee Calculation Instructions

FEE SCHEDULE SUMMARY: WISCONSIN BUILDING CODE

Effective January 1, 1998

Circle appropriate fee and enter total on Page 2.

I. **Building, heating and ventilation, lighting plans.** Fees relating to the submittal of all building and heating and ventilation plans (new, addition, alteration) shall be computed on the basis of the total gross floor area of each building, area of addition or area of alteration and shall be determined in accordance with Table Comm 2.31-1 or Table 2.31-2.

AREA: The area of a building is the area bounded by the exterior surface of the building walls or the outside face of columns where there is no wall. Area includes all roofed areas included porches and garages, except for cantilevered canopies on the building wall. Use the roof area for free standing canopies. Total gross floor area is the summation of all the floor levels, including mezzanines.

Note: Comm 2 provides for a partial fee refund if a plan action has not been taken within 15 days of receipt of all required information.

Area (sq ft)	Table Comm 2.31-1: For Projects Not Located In Certified nicipalities			Table Comm 2.31-2: For Projects Located In Certified nicipalities		
	Building and HVAC	**Building ONLY**	**HVAC OR Lighting Only**	**Building and HVAC**	**Building ONLY**	**HVAC OR Lighting Only**
Less than 2,500	$ 320	$ 270	$ 190	$ 290	$ 240	$ 170
2,501 - 5,000	430	320	240	390	290	220
5,001 - 10,000	580	480	270	520	430	240
10,001 - 20,000	900	630	370	810	570	330
20,001 - 30,000	1,280	900	480	1,150	810	430
30,001 - 40,000	1,690	1,220	690	1,530	1,100	630
40,001 - 50,000	2,280	1,590	900	2,060	1,440	810
50,001 - 75,000	3,080	2,120	1,220	2,780	1,910	1,100
75,001 - 100,000	3,880	2,600	1,690	3,500	2,350	1,530
100,001 - 200,000	5,940	4,240	2,120	5,350	3,830	1,910
200,001 - 300,000	12,200	7,430	4,700	11,000	6,700	4,310
300,001 - 400,000	17,190	11,140	6,900	15,550	10,050	6,220
400,001 - 500,000	21,220	13,790	9,020	19,140	12,440	8,130
Over 500,000	22,810	14,850	10,080	20,570	13,400	9,090

Note: A fee reduction may be taken for plans involving **multiple identical buildings** located on the **same site** and **submitted at the same time:** The fees for the submittal of building, heating and ventilation plans for their first building shall be determined in accordance with the appropriate Table 2.31-1 or 2.31-2 on the basis of the total gross area of one building. The fee for each of the remaining identical buildings shall be computed on the basis of an area of less than 2,500 square feet.

II	Miscellaneous Plans	$250	Miscellaneous plans include: footing & foundation (submitted separately); grandstand; bleacher; exhaust system & spray booth (govt. owned); docks; antennas; observation towers; structural plans submitted as independent projects and other submittals not listed.
	Revision to Previously Examined Plan	$100	No fee if revision requested by plan examiner. Also applies to revisions or re-considerations of previously approved Petitions For Variance.
	Permission to Start (Optional)	$80	Applies only to projects with footings and foundations.
	HVAC Equipment Replacement	$80	Applies only if no duct or piping alterations.
	All other types not mentioned elsewhere		Contact any of the full service offices listed.

SEE FORM SBD-9890 FOR PETITION FOR VARIANCE APPLICATION AND FEES

10. Appointment, Scheduling Information, and Plan Submittal Checklists.
If you wish to schedule a review appointment in advance, call any of the full service offices. At the time of making an appointment, you may request review for a specific office or desired (beginning) date for review. You may also FAX the front page of this application and receive a FAX back with an Appointment Date, Transaction ID No. and Assigned Reviewer. Plans must be received in the office of the appointment no later than 2 working days before the confirmed appointment. Non-scheduled submittals or submittals received without a confirmed appointment date and transaction number on the form may be assigned to offices other than the receiving office depending on reviewer availability. To obtain a submittal checklist call the material order unit at 608-266-1818 or one of the full service offices listed below.

MULTIPLE BUILDINGS WORKSHEET
ATTACH TO FORM SBD-118
DUPLICATE AS NEEDED

Site ID #	Facility ID #	Regulated Object Description	# of Sq. Ft.	Name or Designation for Bldg. (Facility)	Address of Project	Review Requested	Check if Identical to Previous Building	Fee Calculation
Sample	Sample	4-unit residential	5000	Bldg. B, Lot 5	201 Dorsey Pkwy. City, Municipality	Bldg. x HVAC_____ Lighting x	x	$270.00
						Bldg. _____ HVAC_____ Lighting _____		
						Bldg. _____ HVAC_____ Lighting _____		
						Bldg. _____ HVAC_____ Lighting _____		
						Bldg. _____ HVAC_____ Lighting _____		
						Bldg. _____ HVAC_____ Lighting _____		
						Bldg. _____ HVAC_____ Lighting _____		
						Bldg. _____ HVAC_____ Lighting _____		
						Bldg. _____ HVAC_____ Lighting _____		
						Bldg. _____ HVAC_____ Lighting _____		

(a) *Conditional approval.* If, upon examination, the department determines that the plans and the application for approval substantially conform to the provisions of this code, a conditional approval, in writing, will be granted. All non-code-complying conditions stated in the conditional approval shall be corrected before or during construction. A conditional approval issued by the department shall not be construed as an assumption of any responsibility for the design or construction of the building.

Since the contractor is usually unknown at time of plan submittal, it is important that the active parties (owner, designer, supervising professional) determine who is responsible for forwarding the conditions of approval to the contractor.

(b) *Denial of approval.* If the department determines that the plans or the application do not substantially conform to the provisions of this code, the application for conditional approval will be denied, in writing.

PLAN REVIEW ACTIONS

A. CONDITIONAL APPROVAL: *This is an approvable plan that shows compliance with code except for minor items that can be cited as conditionals in the letter. The minor items ans associated conditions must be such that when the designer makes the change, there is no danger of the designer doing it wrong, or, by making the correction, other code violations may be created. The type of conditionals in the conditional approval letter are those which are understood by the designer, contractor, and inspector, and that the conditions can be easily verified by the inspector.*

B. HELD FOR ADDITIONAL INFORMATION (FAX/PHONE): *This type of plan indicates a compliant design for all things shown or the minor violations can be cited as indicated above for a conditional approval plan, however more information or confirmations of items is missing is required before a plan can be approved. The reviewer will call the designer and try to get the additional information faxed in or overnight mailed so they can approve the plan.*

Note that the reviewer is instructed to enter an additional information action in the computer, even if resolution via phone or fax can be done within 24 hours. This action is necessary for accurate data on meeting our goals and administrative rules in acting on a plan within the schedule timeframe and for audit of fee refunds. Quality of submissions can also be gauged by actions taken..

If the additional information is not received timely (within a day) the additional information letter will be generated and sent. to the designer. (See C below)

C. FORMAL ADDITIONAL INFORMATION ACTION *(previously called a hold or abeyance letter) These plans depict an almost approvable design , however they show violations of the code to the extent that some of the plan sheets must be re-drawn or revised, and the violations are of such a complexity that they can not be cited as conditions of approval with any reasonable assurance that the designer can design the changes and convey to the contractor and inspector to bring the element into compliance, or, where design options may generate other code violations if not properly coordinated. The reviewer will call the designer to inform him/her of the action and send an additional information letter to the designer. The submittal to address the additional information issues can be submittaed without additional fees and would then be processed and reviewed by the reviewer within 5 days of receipt. If a resubmittal is not received within 30 working days a denial action will be taken (see D below).*

D. DENIAL: *These plans basically depict a design that can not be approved, and show violations that require general revisions to the entire plan. Generally, all or most of the plan sheets will have*

to undergo major revision, or will have to be completely redrawn. Other occurrences that would generate an action of DENIAL would be a resubmission of plans following an additional information action where the re-submitted plans do not show the corrections indicated in our previous letter and also if no response to an additional information letter is received within 30 working days.. If the designer is making an honest attempt to make the corrections requested, then, perhaps, another hold would be appropriate.

Comm 2 programmatical code required fees for a denial resubmission are the full fee as if it were a new submittal. Utilizing Comm 2.04 and considering the reviewer familiarity with a recent review, the division will allow a $100 fee will to be charged. (2 hours at $40/hour plus $20 handling fee)if the resubmittal occurs within 30 days of denial action. This fee would be by transaction id, thus if the plan had many objects or even multiple buildings submitted on the same plan transaction number the $100 fee would be applied

Plan Review Letter Terminology

Cust ID No.: *The S&B computer system assigns a customer identification number to a person associated with a plan review or other division service. That customer may be acting in a variety of capacities. They may be the submitting party, or the designer, or the owner, for example. Each customer will have only one number in the S&B system, unless they choose to identify themselves by different business names/addresses relating to different work activities. The customer identification number will be a useful tool when a customer requests from S&B information relating to their business.*

Conditional Approval: *The conditional approval is just what it says: "conditional." Approval requires all non-code-complying conditions stated in the conditional approval be corrected by the owner before or during construction. S&B does not require that plan sheets be perfect to obtain a conditional approval. If the plans substantially conform to the code, the plan reviewers usually do not ask for corrections of the plan sheets. The plan approval letter states the reviewer's conditions of approval, for corrections of code deficiencies noted on the plans. Neither a completed plan review or a completed inspection can provide approval of something that is not code compliant.*

Transaction Number: *A transaction relates to the provision of an individual service by S&B. The review of a buildings would have a transaction number. The later review of the HVAC system in that building would have another number. The transaction numbers allow individual service activities to be tracked. Transactions for the same building (or facility) are linked to each other in the S&B computer system.*

Facility: *A facility usually refers to an individual building. It may also refer to a location where there is a different kind of regulated object that S&B wishes to track, an underground storage tank, for example. There may be multiple facilities located on one site. There may be ten shops and ten tanks located at one shopping center.*

Site ID: *A site is the pivot point of the S&B computer plan review tracking system. A site may locate a shopping center or a single building. Using site numbers as the base for identifying locations for S&B services allows project owners and designers to track multiple facilities they are responsible for on one site. An industrial complex may have six elevators that were designed and submitted for review at six different times. Nevertheless, the complex manager and S&B can use the site information to track all six of those elevators to ensure compliance with safety regulations. S&B can also plan efficient inspection of all elevators at one site.*

Object Type: *Is a categorical description of what was reviewed or acted upon. Examples include building object, HVAC object, etc.*

Regulated Object ID #: *Is the identifier for the specific object acted upon.*

ATTENTION PLAN SUBMITTER

The following items have been identified as major reasons for plans to be withheld.

I. Structural

a. Sample structural calculations not submitted (50.12 (4)(a))

b. Connection details not shown (50.12 (4)(a) 2.c.)

c. Structural elements do not satisfy requested class of construction requirements (51.03)

d. All design loads are not indicated on the plan (50.12 (3)(b))

II. Fire-Resistive Assemblies

a. Assembly test number or cross section of assembly not shown on plans (50.12 (3)(b) 4.)

b. Cross section does not correspond to test assembly (51.043)

c. Existing fire walls not shown for existing parts of the building (50.12 (3)(b) 2.)

III. Barrier Free

a. Sanitary facilities not sized properly

b. Parking and passageway to the building incorrect

IV. Exiting

a. Schematic of existing conditions not shown (50.12)

b. Specific room use not shown (50.12.

c. Distribution of exits incorrect (51.151)

d. Stair details incorrect (51.16)

Note: A letter will be sent to the designer, supervising professional, and the owner of record with a statement relating to the examination of the plans and citing the conditions of approval or denial. The plans will be dated and stamped "conditionally approved" or not approved," whichever applies. The department will retain one copy of the plans for all projects. The department will forward one copy of the plans for projects of less than 100,000 cubic feet and alterations of less than $100,000 estimated cost to the state building inspector of record. The remaining plans will be returned to the person designated on the plans approval application.

(6) REVISIONS TO APPROVED PLANS.

(a) 1. All revisions and modifications, which involve provisions of this code, made to plans or specifications, which have previously been granted approval by the department, shall be submitted to the department for review.

2. All revisions and modifications to the plans shall be approved in writing by the department prior to the work involved in the revision or modification being carried out.

(b) A revision or modification to a plan, drawing or specification shall be signed and sealed in accordance with s. COMM 50.07 (2), if applicable.

COMM 50.13 FOOTING AND FOUNDATION APPROVAL.

(1) The department or its authorized representative, as provided in s. COMM 50.21, may conditionally approve footing and foundation plans to permit construction of footings and foundations prior to the examination and approval of the complete plans upon submission of:

(a) A plan approval application form, SBD 118;

(b) At least 4 bound sets of footing and foundation plans which:

1. Include a plot plan; and
2. Are signed and sealed in accordance with s. COMM 50.07 or 50.08, if applicable.

(c) At least one set of:

1. Schematic floor plans indicating the exits;
2. Building elevations;
3. Itemized structural loads; and
4. Structural footing and foundation calculations; and

(d) The fee as specified in ch. COMM 2.

(2) The department shall review and make a determination on an application for footing and foundation approval within 15 business days of receipt of the application and all forms, fees, plans and documents required to complete the review.

COMM 50.14 PERMISSION TO START CONSTRUCTION.

(1) The department or its authorized representative, as provided in s. COMM 50.21, may issue a permission to start construction form for the footings and foundations upon submission of:

(a) A completed plan approval application form, SBD 118;

(b) 1. At least 4 bound sets of building plans and one copy of specifications; or
2. At least 4 bound sets of footing and foundation plans and the information specified in s. COMM 50.13 (1).

(c) A written request by the owner to start construction, form SBD 198; and

(d) Fees as specified in ch. COMM 2.

Submitters wishing to start construction while plans are waiting to be reviewed may request Permission to Start Construction. This is an optional service. Upon submission of plans in accordance with COMM 50.12 or 50.13, and a completed Permission to Start Construction Form, SBD-198, a very cursory review of the submitted plans will be made, and if found acceptable, permission to start will be issued. This is a risk letter, and the owner and designer agree to make any changes to the footings and foundations which may be necessary following the formal review of the submitted plans. Not all municipalities accept Permission to Start Construction forms for the purpose of issuing building permits. Therefore, submitters should check with the municipal authorities regarding their procedures before requesting and paying for a Permission to Start Construction. Also note, if permission to start is "not approved," an additional submittal and fee is required for a second review.

Question 1: *I am the designer of a building and will be submitting plans to the state requesting Permission to Start Construction. The owner is presently not available. May I sign the form on behalf of the owner?*

*Answer: No. **Both** the owner and the designer must sign the Permission to Start Construction form. In order for you to sign on behalf of the owner, you would have to also submit a Power of Attorney from the owner granting you that authority.*

***Question** 2: My plans have been reviewed and withheld due to items which do not substantially affect the footing/foundation. May a permission to start be issued so that footing foundation work may begin while revised plans are being prepared and scheduled for review?*

***Answer:** Yes, at the submitter's request and at the plan reviewer's discretion (based on specific project items), a footing and foundation approval may be issued in conjunction with the building withhold notice as part of the plan reviewer's action on the review. No additional submittal of forms (owner's and designer's signature already on application form SB-118) are necessary to issue this since it is an examiner's action after a full review of the plans. The $250 footing/foundation fee will be charged and must be submitted prior to review of the revised building plans. Permits to start issued prior to the full review of plans require the submittal of the SB-118 permit to start form and appropriate fees.*

(2) The holders of the permission form shall proceed at their own risk without assurance that a conditional approval for the building will be granted.

(3) The department shall review and make a determination on an application for permission to start construction within 3 business days of receipt of the application and all forms, fees, plans and documents required to complete the review.

COMM 50.15 EVIDENCE OF PLAN APPROVAL.

The architect, engineer, designer, builder, manufacturer or owner shall keep at the building site one set of plans bearing the stamp of conditional approval and a copy of the specifications. The plans shall be open to inspection by an authorized representative of the department.

*Many costly problems have occurred due to the person in charge of construction not being forwarded the letter of conditional approval. Typically the contractor is not known at the time of plan approval, therefore a letter is not sent directly to them. **It is extremely important that the owner or supervising professional makes sure that the contractor understands all conditions of approval and a copy of the letter of approval is kept at the job site for reference.***

COMM 50.155 SPRINKLER DOCUMENTS.

(1) PLANS.

(a) 1. Except as provided in subd. 2, where automatic fire sprinkler systems are to be installed or altered, sprinkler plans and specifications shall be present at the job site and made available, upon request, to the department, its agent or local governmental agencies exercising jurisdiction.

2. a. When a project involves the alteration or addition of 20 or less sprinkler heads to an existing automatic fire sprinkler system, sprinkler plans and specifications shall not be required to be present at the job site or made available, unless required by local ordinance.

b. When sprinkler plans and specifications are not provided for a project involving the alteration or addition of 20 or less sprinkler heads to an existing automatic fire sprinkler system, the automatic fire sprinkler contractor responsible for the work shall provide a written description of the type and scope of the work. The description shall be included with the

material and test certificate, if required. The description shall be made available, upon request, to the department, its agent or local governmental agencies exercising jurisdiction.

(b) The sprinkler plans at the installation site shall be:

1. Signed and sealed in accordance with s. A-E 2.02 by an architect, engineer or sprinkler designer who is registered by the department of regulation and licensing; or

2. Signed, including license number, and dated by an automatic fire sprinkler contractor who is responsible for the installation of the sprinklers and who is licensed by the department of commerce.

(c) Where automatic fire sprinkler plans are required by local ordinance to be reviewed and approved by a local governmental agency, the sprinkler plans at the installation site shall bear evidence of that approval.

(d) The plans for the automatic fire sprinkler system to be at the installation site shall include at least:

1. The name of the:
   a. Owner of the building; and
   b. Occupant or occupants in the building;
2. The location or address of the building;
3. A full height cross section through the building;
4. The location within the building of:
   a. Partitions, walls, and fire walls;
   b. Concealed spaces, closets, attics and bathrooms;
   c. Sprinklers;
   d. Alarms;
   e. Pumps, valves, drain pipes and test connections; and
   f. Pipe hangers and supports.
5. The occupancy class of each area or room within the building;
6. The sources of water supply, including the static pressure, residual pressure, the flow and the dates and time of determination for each;
7. The location and size of:
   a. All aboveground and underground piping; and
   b. Hose outlets.
8. The number of sprinklers on each riser per floor; and
9. The relative elevations of sprinklers, junction points, and supply points.

(e) The specifications for the automatic fire sprinkler system to be at the installation site shall include at least:

1. The type of materials, and devices that comprise the sprinkler system;
2. The settings of pressure reducing valves; and
3. Type and amount of antifreeze solutions being employed, if any.

(2) SPRINKLER MATERIAL AND TEST CERTIFICATES.

(a) Where automatic fire sprinkler systems have been installed or altered, completed sprinkler material and test certificates shall be made available, upon requested, to the department, its agent or local governmental agencies exercising jurisdiction.

(b) A sprinkler material and test certificate shall provide at least the information as enumerated in NFPA 13, s. 5-6, or NFPA 13R, s. 2-1, depending upon the type of sprinkler system.

COMM 50.16 REVOCATION OF APPROVAL.

The department may revoke any approval, issued under the provisions of this code, for any false statements or misrepresentation of facts on which the approval was based.

COMM 50.17 EXPIRATION OF PLAN APPROVAL AND EXTENSION OF PLAN APPROVAL.

(1) EXPIRATION OF PLAN APPROVAL.

(a) *Building Shell.* Except as provided in par. (e), plan approval by the department or its authorized representative for new buildings and building additions shall expire 2 years after the approval date indicated on the approved building plans if the building shell is not closed in within those 2 years.

(b) *Occupancy.* Except as provided in sub. (2), plan approval by the department or its authorized representative for new buildings and building additions shall expire 3 years after the approval date indicated on the approved building plans if the building is not ready for occupancy within those 3 years.

(c) *Alterations.* Except as provided in sub. (2), plan approval by the department or its authorized representative for interior building alterations shall expire 1 year after the approval date indicated on the approved building plans if the alteration work is not completed within that year.

(d) *HVAC construction only.* Except as provided in sub. (2), plan approval by the department or its authorized representative for heating, ventilating, or air conditioning construction that does not include any associated building construction shall expire 1 year after the approval date indicated on the approved plans if the building or building area affected by the plans is not ready for occupancy within that year.

(e) *Mausoleums.* Plan approval by the department or its authorized representative for mausoleums within the scope of s. 440.92 (2)(e), Stats., shall expire 3 years after the date indicated on the approved building plans of the building shell if not closed within those 3 years.

(2) EXTENSION OF PLAN APPROVAL. Upon request and payment of the fee specified in ch. COMM 2, the expiration dates in sub. (1)(b), (c), and (d) shall be extended for one 1-year period provided the request is submitted prior to expiration of the original approval.

Note that an extension cannot be requested for the shell approval uner (1)(a). Other approvals can be extended if the request is made prior to the expiration date of the original approval. Persons requesting extension should submit a letter requesting the extension, a completed Plan Approval Application Form for the project, a fee of $75.00, and if the code has changed since the original approval, four sets of plans showing revisions necessary to comply with the current code.

Note: According to s. 66.05 (1) (a), Stats., the local governmental body or building inspector may order the razing of buildings or structures, or portions thereof, where there has been a cessation of normal construction for more than 2 years.

COMM 50.175 DEPARTMENT LIMITATION.

A conditional approval of a plan by the department shall not be construed as an assumption of any design responsibility.

COMM 50.18 INSPECTIONS.

(1) ON-SITE. Inspections shall be conducted by an authorized representative of the department to determine whether or not the construction or installations conform to the conditionally approved plans, the conditional approval letter, and the provisions of chs. COMM 50 to 64.

After approval of plans, inspectors will visit the site to determine if the building is being constructed in accordance with the approved plans. It is not necessary to notify the state to request an inspection, however, local municipalities may have notification requirements with respect to the need for inspection at certain times during the construction period.

Note: Municipalities certified under s. COMM 50.21 are authorized representatives of this department to make the inspections specified in this section, but not the maintenance or life-safety inspections specified in s. COMM 56.21 and subch. IV of ch. COMM 56 except that 1st class cities may perform these inspections.

(2) IN-PLANT. Manufacturers of multifamily dwellings shall contract with the department or an independent inspection agency to conduct in-plant inspections to assure that the manufactured multifamily dwellings are in compliance with the plans approved by the department. All inspections shall be performed by a certified commercial building inspector.

This inspection verifies compliance with the Wisconsin code. Local municipalities may have more restrictive codes; thus it is advisable to check with local authorities early in the process to assure compliance.

Note: See Appendix A for an example of the inspection progress report form (SBD-224) and inspection report and orders form (SBD-2).

(3) PUBLIC MAUSOLEUM. Within 30 days after receiving written notice from a cemetery authority that the construction or conversion of a public mausoleum has been completed, the department or authorized agent shall inspect the public mausoleum and provide written notification of violations. Except as provided in s. 157.12 (2) (b), Stats., public mausoleum spaces may not be sold prior to approval by the department or its authorized agent.

Note: Sale of public mausoleums spaces is permitted prior to departmental approval in accordance with the requirements of the department of regulation and licensing.

COMM 50.19 BUILDING MATERIAL APPROVALS.

(1) MATERIALS, EQUIPMENT AND DEVICES. All materials, equipment and devices not specifically mentioned in this code shall be permitted if approved in writing by the department. Sufficient data, tests and other evidence to prove that the material, equipment or device is equivalent to the standards required in this code shall be submitted. Upon receipt of a fee and a written request, the department may issue an approval number for the material, piece of equipment or device. The department shall review and make a determination on an application for material, equipment and device approval within 30 business days of receipt of all forms, fees, plans and documents required to complete the review.

(2) TESTING LABORATORIES.

(a) A testing laboratory may submit to the department a request to be recognized as an approved testing laboratory which evaluates and certifies materials, products or assemblies for conformance with the specifications or standards of this code.

(b) The request for recognition as an approved testing laboratory under par. (a) shall include:

1. A completed building material approval application;

2. Information, data and other evidence describing the operations, policies and procedures of the testing laboratory; and

3. A fee as specified in ch. COMM 2.

(c) The department shall review and make a determination on a request for recognition as an approved testing laboratory under par. (a) within 30 business days of receipt of all forms, fees and documents required to complete the review.

(3) REQUIRED APPROVALS. An approval shall be obtained for:

(a) Light transmitting plastics; and

(b) Direct vent sealed combustion chamber appliances.

Note: A building material approval application, form SBD-8028, may be obtained from the Safety and Buildings Division, P. O. Box 7969, Madison, Wisconsin 53707.

COMM 50.20 FEES.

Fees for petitions for variance, material approval, plan examination and approval, and for inspection of buildings, structures, and heating and ventilating shall be submitted as specified in s. COMM 2. Fees shall be submitted at the time the application for approval is submitted. No plan examinations, approvals or inspections may be made until the fees are received.

Part V -- First Class City and Certified Municipal Approvals

A current list of the certified municipalities is printed in the front of this commentary, in the Wisconsin Building Codes Report, or on the reverse side of the fee schedule summary. If your project is located within the jurisdiction of a certified municipality, please check with the local authorities prior to submission of plans to the state to see if state review will be required.

The cities of Madison and Milwaukee are certified by the Department to do plan reviews on all projects within their city limits without regard to size of the project.

Buildings owned by the State of Wisconsin must be submitted to the state for review. Certified municipalities, including Madison and Milwaukee, are not authorized to do plan review for state-owned buildings.

COMM 50.21 CERTIFIED MUNICIPALITIES AND COUNTIES.

(1) GENERAL. This section shall establish the manner under which cities, villages, towns and counties may examine building plans and inspect buildings relative to s. 101.12 (3) (a), (b) and (g), Stats.

(2) CONDITIONS OF PARTICIPATION. Before assuming the responsibilities of examining building plans and providing inspection services cities, villages, towns and counties shall comply with all of the following conditions:

(a) Notify the department, in writing, at least 30 days prior to the date upon which the municipality or county intends to assume the responsibilities.

(b) Adopt by ordinance or regulation the responsibilities of plan examination and building inspection.

(c) Adopt by ordinance or regulation chs. COMM 50 to 64 in its entirety.

(d) Submit to the department a certified copy of all ordinances or regulations assuming the plan examination and building inspection responsibilities and adopting chs. COMM 50 to 64.

(e) Employ certified commercial building inspectors to perform the plan examination and building inspection functions.

(f) Forward to the department any information requested by the department relative to the examination of plans and the inspections of buildings.

(g) Notify the department, in writing, at least 30 days prior to the date upon which the municipality or county intends to relinquish the responsibilities.

(3) JURISDICTION.

(a) *Departmental.*

1. Nothing in this section shall prevent the department from conducting its own investigations or inspections or issuing orders relative to the administration and enforcement of chs. COMM 50 to 64.

2. The department shall administer and enforce chs. COMM 50 to 64 in any municipality or county which has not assumed the responsibilities for plan examination and building inspections under sub. (2).

(b) *County.*

1. Ordinances enacted by a county under sub. (2) establishing county plan examination and building inspection functions shall apply to all municipalities within that county which have not assumed those functions pursuant to sub. (2).

2. Ordinances enacted by a county under sub. (2) establishing county plan examination and building inspection functions may not prevent or prohibit any municipality within that county from assuming those functions pursuant to sub. (2) at any time.

(4) CERTIFICATION OF INSPECTORS. Inspectors employed by agent municipalities and counties to administer and enforce chs. COMM 50 to 64 under sub. (2) shall be certified by the department in accordance with ch. Comm 5 as certified commercial building inspectors.

(5) PLAN EXAMINATION.

(a) *First class cities.* Drawings, specifications and calculations for all the types of buildings and structures specified in s. COMM 50.12 (1), except state-owned buildings and structures, to be constructed within the limits of a first class city shall be submitted to that city, if that city has assumed the responsibilities of plan examination and building inspection in accordance with sub. (2).

(b) *Other municipalities and counties.* Drawings, specifications and calculations for all the types of buildings and structures specified in s. COMM 50.12 (1), except state-owned buildings and structures, to be constructed within the municipal limits of a municipality other than a first class city or within a county shall be submitted to that municipality or county if the

municipality or county has assumed the responsibilities of plan examination and building inspection in accordance with sub. (2) and if the plans are for:

1. A new building or structure containing less than 5,000 square feet of total floor area;
2. An addition to a building or structure where the area of the addition results in the entire building or structure containing less than 5,000 square feet of total floor area; or
3. An alteration of a space involving less than 10,000 square feet of total floor area.

Note: The department will allow use of 50,000 and 100,000 cubic feet of total volume in lieu of the thresholds of 5,000 and 10,000 square feet of total floor area, respectively, as established in s. 101.12 (3) (b), Stats., provided calculations showing that volume are included in the submittal to the municipality.

Question: *Is the construction of a mezzanine or the creation of new floor levels within the confines of an existing building considered an addition or an alteration?*

Answer: *Both are considered* ***alterations*** *since the volume and the footprint of the building are not increased. Many times the creation of new floor levels in existing buildings requires complex structural analysis. Certified municipalities should not hesitate to utilize the project waiver provision ((c) below) for projects of complex nature.*

COMM 50.21 (5)(b) Note: The department will allow use of 50,000 and 100,000 cubic feet of total volume in lieu of the thresholds of 5,000 and 10,000 square feet of total floor area, respectively, as established in s. 101.12 (3)(b), Stats., provided calculations showing that volume are included in the submittal to the municipality.

(c) *Project waiver.* An agent municipality or county may waive its jurisdiction for the plan review of a specific project, in which case, plans shall be submitted to the department for review and approval.

This "waiver" was created to give certified municipalities a means to refer the plan review back to the state plan review agency when there is a compelling reason the review cannot be done locally. Examples of why a certified municipality might "waive" plan review back to the Division of Safety & Buildings include (but are not limited to): complex structural design of the project; the complexity of the review (e.g., hospitals or nursing homes; an aging school or other complex review); or an apparent conflict of interest for the municipality or inspector. The "waiver" is done on a case-by-case basis.

Please note that in ***ALL CASES****, if a certified municipality chooses to "waive" plan review back to the Division of Safety & Buildings, this project waiver is for the entire submittal (including all related components). For example, the municipality CANNOT review the building plans and then choose to "waive" heating plans or truss plans. If review is begun locally, the subsequent reviews relevant to that project must be completed by the certified municipality (who may contact the Certified Municipality Coordinator for assistance with the review).*

Requests have been made to the Department that a means also be created to allow the municipalities to "accept" plan reviews not normally delegated to them (e.g., a very small entry vestibule onto a building over 50,000 cubic feet). The Department will allow the certified municipality to assume responsibility for the review of such limited work PROVIDED THAT the certified municipality wishes to accept the review AND obtains approval (on a case-by-case basis) from the Certified Municipality Coordinator. Requests directly from the submitter (owner, designer, or other) will NOT be honored; the Department will only consider and respond to requests directly from the certified municipality to "assume" the review. Project information (street

address, owner, the scope of the work, etc.) must be provided at the time the request to "assume" the plan review is made by the municipality.

(d) *Plan submission procedures.*

1. A building permit application shall be included with the plan submitted to the municipality or county having jurisdiction for examination.

2. At least 2 sets of complete building plans and one copy of specifications shall be submitted to the municipality or county having jurisdiction for examination.

Plans shall be signed and sealed in accordance with COMM 50.07 even if submitted to a municipality.

3. Building plans submitted to a municipality or county for examination shall include the information specified in s. COMM 50.12 (3) and (4).

(e) *Plan approval.*

1. If the municipality or county having jurisdiction determines that the plans submitted substantially conform to the provisions of chs. COMM 50 to 64 or other ordinances and regulations, an approval shall be issued as follows:

a. The plans shall be stamped "CONDITIONALLY APPROVED," signed and dated by a certified commercial building inspector.

b. One set of the conditionally approved plans shall be retained by the municipality or county and all other plans shall be returned to the submitter or their representative.

c. A notice of conditional approval shall be provided, in writing, to the submitter and the building owner stating all conditions of approval.

2. All non-code-complying and other conditions stated in the conditional approval notice shall be corrected or met before or during construction, and before occupancy of the building.

(f) *Denial of plan approval.* If the municipality or county determines that the plans submitted do not substantially conform to the provisions of chs. COMM 50 to 64 or other legal ordinances and regulations, a denial for plan approval shall be issued as follows:

1. The plans shall be stamped "NOT APPROVED," signed and dated by a certified commercial building inspector.

2. One set of the not-approved plans shall be retained by the municipality or county and all other plans shall be returned to the submitter or their representative.

3. A notice of the not-approved plans shall be provided in writing, to the submitter and the building owner stating the reasons for the denial.

(g) *Liability.* A conditional approval of a plan by a municipality or county may not be construed as an assumption of any responsibility on the part of the municipality, the certified commercial building inspector or the department for the design or construction of the building.

(6) INSPECTION. Inspections shall be conducted by an agent municipality or county to ascertain whether or not the construction or installation for buildings and structures conforms to the conditionally approved plans, the notice of conditional approval and chs. COMM 50 to 64 as follows:

(a) All inspections, for the purpose of administration and enforcement of chs. COMM 50 to 64, shall be performed by a certified commercial building inspector.

(b) A written report of each inspection shall be prepared. The report shall include the name of the certified commercial building inspector.

(c) A copy of each inspection report shall be furnished to the owner and plan submitter.

(d) A copy of each inspection report shall be permanently maintained in the municipal files or county files.

(e) The inspection report shall indicate all items of non-compliance noted during the inspection.

(f) If non-complying items are not corrected, orders to correct shall be issued in accordance with local ordinances.

Note: Certified municipalities are authorized to perform the inspections specified in s. COMM 50.18.

(7) FEES. Municipalities and counties having jurisdiction of plan examination and building inspections may set by ordinance the fees for plan examination and building inspection services.

Subchapter VI -- Enforcement, Petition for Variance, Appeals, and Penalties

COMM 50.23 ENFORCEMENT.

The provisions of this code shall be enforced by the department, or by municipal officials or other local officials who are required by law to enforce the administrative rules of the department.

COMM 50.24 APPEALS.

Any person affected by any local order which is in conflict with a rule of the department may petition the department for a hearing on the grounds that the local order is unreasonable and in conflict with the rule of the department. The department shall review and make a determination on an appeal of a local ordinance within 60 business days of receipt of a verified petition submitted with all forms, fees, plans and documents required to complete the review.

Note: Section 101.01 (1) (g), Stats., defines "local order" as any ordinance, order, rule or determination of any common council, board of aldermen, board of trustees or the village board, of any village or city, or the board of health of any municipality, or an order or direction of any official of such municipality, upon any matter over which the department has jurisdiction.

COMM 50.25 PETITION FOR VARIANCE.

(1) PROCEDURE. The department shall consider and may grant a variance to an administrative rule upon receipt of a fee, a completed petition for variance form from the owner, and a position statement from the fire department having responsibility and an interest in the rule, provided an equivalency is established in the petition for variance which meets the intent of the rule being petitioned. The department may impose specific conditions in a petition for variance to promote the protection of the health, safety or welfare of the employes or the public. Violation of those conditions under which the petition is granted constitutes a violation of these rules.

The formal Petition for Variance procedure should be used only as a last resort. Plan reviewers and inspectors have a great deal of experience working with the intent and application of the code. Prior to a petition for variance submittal, please discuss your design problem with the plan reviewer, inspector, and/or their supervisor. If an acceptable solution to your problem is not achievable, you may petition to utilize an alternate design satisfying the intent of the code in lieu of

the strict code language. Remember a variance is an acceptance of an equivalency to the code intent, not a waiver from the code.

(2) PETITION PROCESSING TIME. Except for priority petitions, the department shall review and make a determination on a petition for variance within 30 business days of receipt of all calculations, documents and fees required to complete the review. The department shall process priority petitions within 10 business days.

Note 1: See submittal supplement at end of this book for an example of the petition for variance form (SBD-8) and the fire department position statement (Form (SBD-8A).

Note 2: Section 101.02 (6), Stats., outlines the procedure for submitting petitions to the department and the department procedures for hearing petitions.

COMM 50.26 PENALTIES.

Penalties for violations shall be assessed in accordance with s. 101.02, Stats.

Note 1: Section 101.02 (13) (a), Stats., indicates penalties will be assessed against any employer, employe, owner or other person who fails or refuses to perform any duty lawfully enjoined, within the time prescribed by the department, for which no penalty has been specifically provided, or who fails, neglects or refuses to comply with any lawful order made by the department, or any judgment or decree made by any court in connection with ss. 101.01 to 101.25. For each such violation, failure or refusal, such employe, owner or other person must forfeit and pay into the state treasury a sum not less than $10 nor more than $100 for each violation.

Note 2: Section 101.02 (12), Stats., indicates that every day during which any person, persons, corporation or any officer, agent or employe thereof, fails to observe and comply with an order of the department will constitute a separate and distinct violation of such order.

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PETITION FOR VARIANCE
INFORMATION AND INSTRUCTIONS Comm 3

In instances where exact compliance with a particular code requirement cannot be met or alternative designs are desired, the Division has a petition for variance program where it reviews and considers acceptance of alternatives which are not in strict conformance with the letter of the code, but which meet the intent of the code. **A variance is not a waiver from a code requirement.** The petitioner must **provide an equivalency which meets the intent** of the code section petitioned to obtain a variance. Documentation of the rationale for the equivalency is requested below. Failure to provide adequate information may delay your petition. Pictures, sketches, and plans may be submitted to support equivalency. If the proposed equivalency does not adequately safeguard the health, safety, and welfare of building occupants, frequenters, firefighters, etc., the variance request will be denied. NOTE: A SEPARATE PETITION IS REQUIRED FOR EACH BUILDING AND EACH CODE ISSUE PETITIONED (i.e., 57.13 window issue cannot be processed on the same petition as 51.16 stair issue). It should be noted that **a petition for variance does not take the place of any required plan review submittal.**

The Division is unable to process petitions for variance that are not properly completed. Before submitting the application, the following items should be checked for completeness in order to avoid delays:

- Petitioner's name (typed or printed)
- Petitioner's signature
- The Petition for Variance Application must be signed by the owner of the building or system unless a Power of Attorney is submitted.
- Notary Public signature with affixed seal
- Analysis to establish equivalency, including any pictures, illustrations or sketches of the existing and proposed conditions to clearly convey your proposal to the reviewer.
- Proper fee
- Any required position statements by fire chief or municipal official

  A position statement from the chief of the local fire department is required for fire safety issues. **No position statement is required for** nonfire safety topics such as sanitary, plumbing or POWTS systems and energy conservation. Position statements for both the fire department and municipality are required for ILHR 69 barrier-free petitions. For rules relating to one- and two-family dwellings, only a position statement from the local enforcing municipality is required. Position statements must be completed and signed by the appropriate fire chief or municipal enforcement official. See the back of SBD-9890, Petition for Variance Application form for these position statement forms. Signatures or seals on all documents must be originals. Photocopies are not acceptable.

Contact numbers and fees for the Division's review of the petition for variance are as follows:

Chapter (circle appropriate category)	Revenue Code	Review Office	Contact Number	Fee	Revision Fee
Comm 10, Flammable liquids		Madison	(608) 266-7529	$200	$100
Comm 11-13, LPG, LNG, CNG tanks	8258	Waukesha	(414) 548-8617	$200	$100
Comm 16, Electrical	7631	Madison	(608) 266-7529	$200	$100
Comm 18, Elevators	8260	Waukesha	(414) 521-5444	$200	$100
Comm, 20-25 Uniform Dwelling Code	7655	Madison	(608) 267-5113	$125	$50
Comm, 41-42 Boilers and Pressure Vessels	8258	Waukesha	(414) 548-8617	$200	$100
Comm 50-64, Commercial Building Code	7648	All Offices	See Numbers Below	$490	$100
Comm 66, Uniform Multi-Family Dwellings	7648	All Offices	See Numbers Below	$490	$100
Comm 67-68, Rental Unit Energy Efficiency Code	7646	Madison	(608) 266-1930	$125	$50
Comm 69, Barrier-Free Requirements	7648	All Offices	See Numbers Below	$200	$100
Comm 70, Historic Building Code	7648	All Offices	See Numbers Below	$300	$100
General Plumbing	7657	All Offices	See Numbers Below	$225	$75
Setback	7657	All Offices	See Numbers Below	$100	$75
Swimming Pools	7650	Madison	(608) 267-3605	$225	$75
General POWTS	7657	All Offices	See Numbers Below	$225	$75
Setback	7657	All Offices	See Numbers Below	$100	$75
Site Evaluation	7657	All Offices	See Numbers Below	$225	$75
Experimental	7657	All Offices	See Numbers Below	$200	$75
Aerobic	7657	All Offices	See Numbers Below	$200	$75
Sand Filter	7657	All Offices	See Numbers Below	$200	$75
All Other Chapters				$200	$100

Revisions are accepted only for 1 year after action on original petition.

Priority Review: The Department will schedule Petitions for Variance at the earliest available date, or the date requested at time of scheduling, which ever is later. Therefore, Priority Reviews are not generally available. In special circumstances, the Section Chief of the reviewing office may permit review prior to the scheduled date upon request by the submitter. If earlier review is permitted by the Section Chief, the Petition review fees will be doubled.

Except for special cases, the Division will review and make a determination on a petition for variance within 3 business days of the scheduled beginning date, provided all calculations, documents, and fees required for the review have been received.

Appointment and Scheduling Information

It is strongly recommended that an appointment may be made in advance. Call the numbers above for information, and for scheduling any of the full service offices listed below. **Please have this form completed prior to calling.** At the time of making an appointment, you may request review for a specific office or desired (beginning) date for review. Please schedule the petition review with the same office where the plan was/will be reviewed. Certain petitions may be limited to certain offices depending on the petition issues, see above table for appropriate office.

Petitions **must be received** in the office of the appointment no later that **2 working days before the confirmed appointment.**

Madison S&BD	Hayward S&BD	LaCrosse S&BD.	Shawano S&BD	Green Bay S&BD	Waukesha S&BD
201 W Washington Ave PO Box 7162 Madison WI 53707-7162 608-266-3151 Fax: 608-261-6699 TDD 608-264-8777 Email: madisonsch@commerce.state.wi.us	15837 USH 63 Hayward WI 54843 715-634-4870 Fax: 715-634-5150 Email: haywardsch@commerce.state.wi.us	2226 Rose St LaCrosse WI 54603 608-785-9334 Fax: 608-785-9330 Email: lacrossesch@commerce.state.wi.us	1340 E Green Bay Shawano WI 54166 715-524-3626 Fax: 715-524-3633 Email: shawanosch@commerce.state.wi.us	2331 San Luis Place Green Bay, W I 54304 920-492-5601 FAX: 920-492-5604 Email: greenbaysch@commerce.state.wi.us	401 Pilot Court Waukesha WI 53188 414-548-8600 Fax: 414-548-8614 Email: waukeshasch@commerce.state.wi.us

Wisconsin
Department of Commerce

APPLICATION FOR REVIEW
-Complete all pages-

PETITION FOR VARIANCE

Safety & Buildings Division
Bureau of Integrated Services

This page may be utilized for fax appointments
Complete and indicate date plans will be in our office _____

1. Facility Information

Facility (Building) Name: _____

Number and Street _____ Zip: _____

Commerce Site Number (if known): _____

Legal Description: _____

County of: _____

( ) City ( ) Village ( ) Town of: _____

Complete for confirmed appointments*:

Transaction ID: _____

Previous Related Trans. ID: _____

Appointment Date*: _____

Assigned Reviewer: _____

Assigned Office: _____

***Plans must be received in the office of the appointment no later than 2 working days before the confirmed appointment.**

NOTE: Personal information you provide may be used for secondary purposes [Privacy Law s. 15.04(1)(m), Stats.]

2. Owner Information		**3. Designer Information**	
Name		Designer	
Company Name		Design Firm	
Number and Street		Number and Street	
City, State, Zipe Code		City, State, Zip Code	
Contact Person		Contact Person	
Telephone Number	Fax Number	Telephone Number	Fax Number

4. Plan Review Status

☐ Plan submitted with petition
☐ Plan will be submitted after petition determination
☐ Requesting revision ☐ Other: _____

Plan previously review by
☐ State ☐ Municipality
☐ Approved ☐ Held ☐ Denied
Commerce Transaction Number _____

5. State the code section being petitioned AND the specific condition or issue you are requesting be covered under this petition for variance.

_____

_____

6. Reason why compliance with the code cannot be attained without the variance. _____

_____

_____

7. State your proposed means and rationale of providing equivalent degree of health, safety, or welfare as addressed by the code section petitioned.

_____

_____

8. List attachments to be considered as part of the petitioner's statements (i.e., model code sections, test reports, research articles, expert opinion, previously approved variances, pictures, plans, sketches, etc.).

_____

_____

VERIFICATION BY OWNER - PETITION IS VALID ONLY IF NOTARIZED WITH AFFIXED SEAL AND ACCOMPANIED BY REVIEW FEE (See Section Comm 2.52 for complete fee information)

Note: Petitioner must be the owner of the building or system. Tenants, agents, designers, contractors, attorneys, etc., shall not sign petition unless Power of Attorney is submitted with the Petition for Variance Application.

_____ , being duly sworn, I state as petitioner that I have read the foregoing petition and I believe it is true and that I have significant ownership rights to the subject building or project.
Petitioner's Name (type or print)

Petitioner's Signature	Subscribed and sworn to before me this date	Notary Public	My commission expires on

Complete other side for variance requests from Comm 20-25 and Comm 50-64

SBD-9890 (R.10-98)

Owner's Name	Project Location	Plan Number

Fire Department Position Statement

To be completed for variances requested from Comm 50-64, Comm 69, Comm 10, and other fire related requirements.

I have read the application for variance and recommend: (check appropriate box)

☐ Approval ☐ Conditional Approval ☐ Denial ☐ No Comment

Explanation for recommendation including any conflicts with local rules and regulations and suggested conditions:

Fire Department Name and Address

Name of Fire Chief or Designee (type or print)	Telephone Number
Signature of Fire Chief or Designee	Date Signed

MUNICIPAL BUILDING INSPECTION RECOMMENDATION

To be completed for variances requested from Comm 20-23. Also to be used if Comm 50-64 plan review is by municipality or orders are written on the building under construction; optional in other cases.

I have read the application for variance and recommend: (check appropriate box)

☐ Approval ☐ Conditional Approval ☐ Denial ☐ No Comment

Explanation for recommendation including any conflicts with local rules and regulations and suggested conditions:

Municipality Exercising Jurisdiction

Name and Address of Municipal Official (type or print)	Telephone Number of Enforcement Official
Signature of Municipal Enforcement Official	Date Signed

Chapter COMM 51

DEFINITIONS AND STANDARDS

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Note: The definitions of words and phrases not defined in this section should be taken from the current edition of Webster's New International Dictionary.

This code section defines many of the terms used in the code. Users of code should review these definitions as they may differ from the typical dictionary meaning. In addition to the definitions found in this section, many terms are defined elsewhere in the code in the chapters in which they are used. If a term is not defined in this section or elsewhere in the code, the definitions found in the current edition of Webster New International Dictionary will apply.

Most of the definitions are straight forward and require no further comment. However, some are unusual and/or have caused some confusion in application. Particular attention should be given to the definitions followed by commentary explanation in italics.

COMM 51.01 DEFINITIONS.

(1) "**Accessory room**" means any room or enclosed floor space used for eating, cooking, bathrooms, water closet compartments, laundries, pantries, foyers, hallways and other similar

floor spaces. Rooms designated as recreation, study, den, family room, office and other similar floor spaces, in addition to habitable rooms, are not considered accessory rooms.

(1a) Air conditioning. The process of treating air to control simultaneously its temperature, humidity, cleanliness and distribution to meet the requirements of the conditioned space.

(2) Alley. Any legally established public thoroughfare less than 30 feet in width but not less than 10 feet in width whether designated by name or number.

(2m) "Amusement facility" has the meaning given in s. 101.128 (1)(a), Stats.

Note: Section 101.128 (1)(a), Stats., defines amusement facility as any zoo, state or local park, amusement or theme park, state fair park, or county or local fairgrounds. For the purposes of calculating sanitary fixtures, an amusement facility may also be referred to as an outdoor event.

(2r) "Annular space" means the opening around a penetrating item.

(3) Approved. Approval granted by the department under the regulations stated in this code.

(3a) "Approved diversified tests" means fire tests which evaluate materials or construction assemblies representative of actual end use applications.

Note: Approved diversified tests may include, but are not limited to: ASTM E84 -- Test for Surface Burning Characteristics of Building Materials; ASTM E119 -- Fire Tests of Building Construction and Materials; ASTM D1929 -- Standard Test Method for the Ignition Properties of Plastics; FM 4880 -- Factory Mutual Building Corner Fire Test; and UL 1040 -- Outline of Investigation of Insulated Wall Construction.

(4) Area (gross). The maximum horizontal projected area within the perimeter of the outside surface of walls or supports of the building or structure. Exterior cantilever open balconies are not included.

The gross area of a building is that area bounded by the exterior surfaces of the exterior walls. If there are no walls, the area is bounded by the exterior face of supporting columns. For pylon type canopies (one center column or one or more rows of interior columns with the canopy roof cantilevered), the area is determined by projecting imaginary lines down from the roof edge. Cantilevered building elements, such as balconies, rescue platforms, roof eaves, etc., are not included in the gross area of a building.

(5) Area (net). The occupied or usable floor area in a building but not including space occupied by columns, walls, partitions, stairways, mechanical shafts or ducts.

(5a) Areaway. Exterior area whose grade is below the grade (at building) and having at least one side consisting of the exterior wall of a building.

(5b) "Atrium" means a floor opening or series of floor openings connecting 3 or more floor levels, but not including a mezzanine or a balcony, that is covered at the top of the series of openings and is used for purposes other than an enclosed stairway; elevator hoistway; or utility shaft used for plumbing, electrical, air conditioning or communication facilities.

(6) Attic. The space not used for human occupancy located between the ceiling of uppermost story and the roof.

(6m) "Adult family home" has the meaning given in s. 50.01 (1), Stats.

Note: Under s. 50.01 (1), Stats., an "adult family home" means a private residence to which all of the following apply:

Care and maintenance above the level of room and board but not including nursing care are provided in the private residence by the care provider whose primary domicile is this residence for 3 or 4 adults, or more adults if all of the adults are siblings, each of whom has a developmental disability, as defined in s. 51.01 (5), or, if the residence is licensed as foster home, care and maintenance are provided to children, the combined total of adults

and children so served being no more than 4, or more adults or children if all of the adults or all of the children are siblings; and

The private residence was licensed under s. 48.62 as a foster home for the adults specified in par. (a) at least 12 months before any of the adults attained 18 years of age.

(7) "**Automatic**" means functions without human intervention. Automatic as applied to a fire protective device is one which functions without human intervention and is actuated as a result of the predetermined temperature rise, rate of rise of temperature, combustion product or smoke density, such as an automatic fire sprinkler system, automatic fire door, automatic fire shutter, or automatic fire vent.

(7a) "**Automatic fire sprinkler system,**" for fire protection purposes, means an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply, such as a gravity tank, fire pump, reservoir or pressure tank or connection beginning at the supply side of an approved gate valve located at or near the property line where the pipe or piping system provides water used exclusively for fire protection and related appurtenances and to standpipes connected to automatic sprinkler systems. The portion of the sprinkler system above ground is a network of specially sized or hydraulically designed piping installed in a building, structure or area, generally overhead, and to which sprinklers are connected in a systematic pattern. The system includes a controlling valve and a device for actuating an alarm when the system is in operation. The system is usually activated by heat from a fire and discharges water over the fire area.

(7b) "**Automatic fire suppression system**" means a mechanical system designed and equipped to detect a fire, actuate an alarm and suppress or control a fire using water, water spray, foam, carbon dioxide, halogenated agent or other approved suppression agent.

(8) Balcony (exterior). An elevated platform attached to a building and enclosed on one or more sides by railings.

(9) Balcony (interior). An open intermediate level or stepped floor. Also see "Stories, Number of."

An interior balcony is a floor level similar to a mezzanine and subject to the same requirements imposed on mezzanines. The difference between a balcony and a mezzanine is that a balcony must be open to the floor level below while a mezzanine may be either open or enclosed.

(10) Basement. A basement floor is that level below the first or ground floor level with its entire floor below exit discharge grade.

(11) Bearing wall. See "Wall (bearing)."

(11a) "**Bed and breakfast establishment**" has the meaning given in s. 254.61 (1), Stats.

Note: Section 254.61 (1), Stats., reads: "Bed and breakfast establishment" means any place of lodging that:

(a) Provides 8 or fewer rooms for rent to no more than a total of 20 tourists or transients;

(b) Provides no meals other than breakfast and provides the breakfast only to renters of the place;

(c) Is the owner's personal residence;

(d) Is occupied by the owner at the time of rental;

(e) Was originally built and occupied as a single-family residence, or, prior to use as a place of lodging, was converted to use and occupied as a single-family residence; and

(f) Has had completed, before May 11, 1990, any structural additions to the dimensions of the original structure, including by renovation, except that a structural addition, including a renovation, to the structure may, after May 11, 1990, be made within the dimensions of the original structure.

(12) Building. A structure for support, shelter or enclosure of persons or property.

In addition to the typical buildings, temporary or permanent mobile structures such as office trailers are considered buildings subject to the code requirements imposed on buildings. Also permanent awnings are considered as part of a building.

(13) "Building or structure" means public building or place of employment.

(14) Buttress. A structural projection which is an integral part of a wall, primarily to provide resistance to lateral forces.

(15) Cavity wall. See "Wall (cavity)."

(15m) Ceiling protection. The fire protection membrane suspended beneath the floor or ceiling construction which, when included with the construction, develops the fire-resistive rating for the overall assembly.

(16) "Cemetery authority" means any person who owns or operates a cemetery specified in s. 157.065 (1), Stats.

(16a) "Certified commercial building inspector" means a person who holds a credential issued by the department under ch. Comm 5 as a certified commercial building inspector.

(17) Closing device (fire door). A closing device is one which will close the door and be adequate to latch or hold, or both, hinged or sliding door in a closed position.

(a) *Automatic.* An automatic closing device is one which functions without human intervention and is actuated as a result of the predetermined temperature rise, rate of rise of temperature, combustion products or smoke density.

(b) *Self-closing.* A self-closing device is one which will maintain the door in a closed position.

(17g) "Cfm" means cubic feet per minute.

(17m) "Code" means chs. COMM 50 to 64.

(17n) "Column" means an upright member in a building's structural framing, having a spacing of 48 inches or greater on center, which is constructed of heavy timber with nominal cross-sectional dimensions of at least 6 inches by 8 inches, precast or load-bearing concrete, masonry, or steel, and which is used primarily to support axial compressive loads.

(18) Combustible construction. An assembly such as a wall, floor or roof having components of combustible material.

(19) Combustible material. All materials not classified as "noncombustible" are considered combustible. This property of a material does not relate to its ability to structurally perform under fire exposure. The degree of combustibility is not defined by standard fire test procedures.

(19a) "Commercial motor vehicle" means all motor vehicles other than passenger vehicles for not more than 9 passengers.

(19b) "Community-based residential facility" or **"CBRF"** has the meaning given in s. 50.01 (1), Stats.

Note: Section 50.01 (1), Stats., reads: "Community-based residential facility" means a place where 3 or more unrelated adults reside in which care, treatment or services above the level of room and board but not including nursing care are provided to persons residing in the facility as a primary function of the facility. "Community-based residential facility" does not include any of the following:

(a) A convent or facility owned or operated by members of a religious order exclusively for the reception and care or treatment of members of that order.

(b) A facility or private home that provides care, treatment and services only for victims of domestic abuse, as defined in s. 46.95 (1)(a), and their children.

(c) A shelter facility as defined under s. 46.97 (1) (d).

(d) A place that provides lodging for individuals and in which all of the following conditions are met:

1. Each lodged individual is able to exit the place under emergency conditions without the assistance of another individual.

2. No lodged individual receives from the owner, manager or operator of the place or the owner's, manager's or operator's agent or employe any of the following:

a. Personal care, supervision or treatment or management, control or supervision of prescription medications.

b. Care or services other than board, information, referral, advocacy or job guidance; location and coordination of social services by an agency that is not affiliated with the owner, manager or operator, for which arrangements were made for an individual before he or she lodged in the place; or, in the case of an emergency, arrangement for the provision of health care or social services by an agency that is not affiliated with the owner, manager or operator.

(e) An adult family home.

(20) Concrete. See "Types of Concrete," s. COMM 51.045 (1)(a).

(21) Construction. Includes all labor and materials used in the framing or assembling of component parts in the erection, installation, enlargement, alteration, repair, moving, conversion, razing, demolition or removal of any appliance, device, building, structure or equipment.

(22) Corridor. An enclosed passageway in a building for public ingress and egress to and from dwelling units, rooms or other areas and leading to a lobby, foyer or exit discharge.

(22a) Corridor (required exit). A fire-rated enclosure beginning at the end point of maximum allowable exit distance and continuing to the exit discharge door.

A required exit corridor is a fire-resistive enclosure constructed into the building for the purpose of extending exit distance from the outside, as opposed to a typical corridor as defined in (22). The construction requirements, extent and allowable openings into a required exit corridor are the same as required for a stair enclosure in accordance with COMM 51.18.

Note: See line 19 of Table 51.03-A.

(23) Court. A court is an open, exterior space providing required natural light or ventilation for the building or providing a pathway for public egress from a building exit to a public thoroughfare.

(24) Court (inner). An inner court is a court surrounded on all sides by walls.

(25) Court (inner lot line). An inner lot line court is a court bounded on 3 sides by walls and on the remaining side by a lot line or property line.

(26) Court (outer). An outer court is a court bounded on 3 sides with walls and on the remaining side by a street, alley or other open space not less than 15 feet wide.

(27) Court (outer lot line). A court with one side on a lot line or property line and opening to a street or open space not less than 15 feet wide.

(28) Curtain wall. See "Wall (curtain)."

(29) Department. Means the department of commerce.

(29a) "Direct vent sealed combustion chamber appliance" means a gas-fired heating appliance which is constructed and installed so that all air for combustion is brought directly from the outside atmosphere to inside the combustion chamber and all flue gases are discharged directly to the outside atmosphere and that is capable of operating only when the integrity of the sealed combustion chamber is maintained.

This definition is based upon an ANSI standard definition with modifications developed by the Project Committee for Heating, Ventilating and Air Conditioning.

ANSI Standard Z21.64 covers the design and construction of "Direct Vent Central Furnaces." Excerpts from the 1978 standard help to clarify the thoughts and intentions related to the fire safety of these units.

"1.1.6 Parts of a furnace which, when opened or removed, may permit the direct vent system to communicate with the space within which the furnace is installed shall (1) require the use of a tool for displacement, or (2) the furnace shall not be operable when such parts are opened or removed. This provision does not apply to a cover plate complying with 1.4.10 or to a vent/air intake system complying with 1.2.4. (Enumeration and emphasis added)

1.4.10 An opening communicating with the direct vent system to be used for igniting a pilot or placing the furnace in operation shall not exceed 28 square inches (181 cm^2) and shall have an attached cover plate with a marking on or adjacent to the plate to the effect that the plate is to be closed when the furnace is in service.

1.2.4 A vent/air intake system shall be furnished as part of the furnace and shall be provided with means for secure attachment to the furnace or to the structure in which the furnace is installed."

(29m)"Damper (ceiling)" means a device to limit radiant heat transmission through an air outlet or inlet opening in the ceiling membrane of a floor/roof-ceiling assembly having an assembly fire resistance rating of not less than 1-hour.

(29n) "Damper (fire)" means a device, installed in an air distribution system, designed to close automatically upon detection of heat, to interrupt migratory airflow, and to restrict the passage of flame. A combination fire and smoke damper meets the requirements of both.

(29o) "Damper (smoke)" means a device installed in an air distribution system to control the movement of smoke.

(30) Division wall. See "Wall (division)."

(31) Duct. Any pipe, flue, or tunnel used to convey air, gases and entrained materials. An underground duct is any part of a duct that is below the surface of the ground.

(32) Duct furnace. See "Furnace (duct)."

(33) Elevator. See ch. COMM 18.

(34) Equipment. Self-contained systems and apparatus attached to or built into the building and used for mechanical or electrical processing, comfort, safety, sanitation, communication or transportation within a building.

(35) Exhaust ventilating system. See "Ventilating System (exhaust)."

(36) Existing. A building, structure, or equipment completed or in the course of construction or use or occupied prior to the effective date of applicable rules of this code.

(36a) "**Exit**" means that portion of a means of egress which is separated from all other spaces of the building or structure by construction providing a protected way of travel to the exit discharge.

(36b) "**Exit access**" means that portion of a means of egress which leads to an entrance to an exit.

Question: *Can an exit access be via a roof over a lower portion of the building?*

Answer: *A path over a roof may be used as an exit access provided it is accessed by an exit access door (COMM 51.15, as modified by the occupancy chapter involved); meets the corridor width provisions for the occupancy; will support the corridor loading requirement of COMM 53.11 (1)(i) 1.; leads to an exit as required and allowed by the occupancy (enclosed stair, fire escape, unenclosed stair, horizontal exit, etc.); is separated by the roof construction from other occupancies as required by COMM 51.08; and provisions have been made to prevent obstruction of the access by snow (such as an elevated steel grate walkway). Exit distance is measured from the exit, not the access to the roof exit access. Guardrails in accord with COMM 51.162 must be provided between the exit access path and the edge of the roof.*

Exit lights may be required for the roof exit pathway if the exiting route is not designed to be clearly identified, such as by an elevated walk or handrails.

If the roof has only an exit path, it will be considered a roof. However, if the roof is used for occupied purposes such as sundeck, roof garden, party area, etc., it will be counted as a floor level and must meet all structural and fireproofing requirements for a floor. (Remember, although the level may be a roof subject to live loadings of 30 or 40 psf, the exit pathway must be capable of supporting 80 psf.)

(36c) "**Exit access corridor**" means an aisle or passageway in a building that forms that portion of the means of egress which leads to an exit.

(36d) "**Exit access door**" means any door that leads to the exit access.

(37) Exit court. See "Court (exit)."

(37a) "**Exit discharge**" means that portion of a means of egress between the termination of an exit and a street, alley, court or a public way.

(38) Exit discharge grade. See "Grade (exit discharge)."

(38a) "**Exit door**" means a door that leads from that portion of a means of egress known as the exit access to the outside of a building or to a required exit, such as a stairway, smokeproof tower, ramp or horizontal exit.

(38b) "**Exit passageway**" means a horizontal means of exit travel that is protected from a fire in a manner similar to an enclosed interior exit stair.

(39) Exit (vertical). See "Vertical Exit."

(40) Exterior balcony. See "Balcony (exterior)."

(41) Exterior wall. See "Wall (exterior)."

(41c) "**F-rating**" means the time period in hours that a through-penetration fire-stop system will limit the spread of flame through the penetrated assembly, including the penetrating elements, when tested in accordance with ASTM E814.

(41g) "**Facility where the public congregates**" has the meaning given in s. 101.128 (1)(b), Stats.

Note: Section 101.128 (1)(b), Stats., defines facility where the public congregates as any of the following that has a capacity or a seating capacity of 500 or more persons:

1. An amusement facility;
2. A convention or trade hall or center;
3. A specialty event center;
4. A sports or entertainment arena, center, or building;
5. A stadium; and
6. An airport, bus terminal, train station or other transportation center.

(41m) Factory. A factory is any premises wherein labor is used in manufacturing, making or altering or adapting articles for the purpose of trade or gain.

(42) Family. Means 2 or more individuals who are related to each other by blood, marriage, adoption or legal guardianship. For purposes of this code a group of not more than 4 persons not necessarily related by blood or marriage, living together in a single living unit will be considered equivalent to a single family.

Any number of persons, all of whom are related by blood or marriage, are considered one family. Up to four unrelated persons, living together in a living unit, are also considered one family. Five or more unrelated individuals cannot be considered a family, and would individually be considered as tenants. Therefore, five unrelated individuals are not considered as two families but are rather considered as five individual tenants. This distinction becomes important when determining whether or not a building is a one- or two-family residence. Four unrelated individuals in a house would be considered a single family residence. Five unrelated individuals in a house would place the house under the scope of Chapter 57 as a building housing three or more tenants.

(42a) Farm operation. The farm operation is the planting and cultivating of the soil and growing of farm products substantially all of which have been planted or produced on the farm premises.

Please see the discussion on farming and farm operations under the commentary section related to COMM 50.04.

Question: *The code says that substantially all of the products must have been raised by the farmer. What is meant by the word "substantially?"*

Answer: *The department will consider that substantially all of the products involved are farm related if no more than 10 percent of the floor area is devoted to items not meeting the definitions in COMM 51.01 (42a, b, c, d). This will apply to all farm operations, including processing, packing, storing, and sale. In the case of processing, packing, and bulk storage, 90 percent of the product must have been raised by the processor, packer or warehouse owner.*

Note: The farm operation, according to s. 102.04 (3), Stats., includes: the management, conserving, improving and maintaining of the premises, tools, equipment, improvements and the exchange of labor or services with other farmers; the processing, drying, packing, packaging, freezing, grading, storing, delivery to storage, carrying to market or to a carrier for transportation to market and distributing directly to the consumer; the clearing of such premises and the salvaging of timber and the management and use of wood lots thereon but does not include logging, lumbering and wood-cutting operations unless the operations are conducted as an accessory to other farm operations.

(42b) Farm premises. The farm premises is defined to be the area which is planted and cultivated. The farm premises does not include greenhouses, structures or other areas unless used principally for the production of food or farm products.

(42c) Farm products. Farm products are defined as agricultural, horticultural and arboricultural crops. Animals considered within the definition of agricultural include livestock, bees, poultry, fur-bearing animals, and wildlife or aquatic life.

(42d) Farming. Farming means the operation of a farm premises owned or rented by the operator.

(43) Fire door. A door so constructed as to give protection against the passage of fire.

(44) Fire door assembly. The assembly of fire door and its accessories, including all hardware, frames, closing devices and their anchors, so constructed as to give protection against the passage of fire.

(45) Fire door closing device. See "Closing Device (fire door)."

(46) Fire resistance and fire-resistive material. Having the property to withstand fire or give protection from it. As applied to elements of building, it is characterized by the ability to confine a fire or to continue to perform a given structural function, or both.

(47) Fire-resistive classification. Fire-resistive classification is the time in hours during which a material or assembly continues to exhibit fire resistance under conditions of tests and performance as specified in ASTM E-119, ASTM E-152 and ASTM E-163.

(48) Fire-resistive protection. An insulating material applied directly, attached to, or suspended from a structural assembly, to maintain the structural integrity of a member or system for the specified time rating.

(49) Fire-resistive protection, directly applied. A coating material applied directly to the structural element for the purpose of fire protection.

(50) Fire-resistive rating. Refer to fire-resistive classification.

(51) Fire-retardant roof coverings. Roof coverings shall be classified on the basis of protection provided against fire originating outside the building or structure on which they have been installed.

(a) *Class A roof coverings* are those which are effective against severe fire exposures [meeting the 3 methods for fire tests of Class A roof coverings Standard E-108] and possess no flying brand hazard.

(b) *Class B roof coverings* are those which are effective against moderate fire exposures [meeting the 3 methods for fire tests of Class B roof coverings ASTM Standard E-108] and possess no flying brand hazard.

(c) *Class C roof coverings* are those which are effective against light fire exposures [meeting the 3 methods for fire tests of Class C roof coverings Standard E-108] and possess no flying brand hazard.

(52) Fire retardant—treated wood. Fire-retardant wood includes lumber or plywood that has been treated with a fire-retardant chemical to provide classifications [(flame-spread FSC) and fuel contributed FCC] of 25 or less by ASTM method E-84, shows no progressive combustion during 30 minutes of fire exposure by this method, and is so labeled. Fire-retardant wood for decorative and interior finish purposes provides reduced flame-spread classification (FSC) by ASTM method E-84 as specified by the code for materials used in the particular applications.

Fire retardant treated wood, meeting the requirements of this definition, is considered flame retardant. It is not considered noncombustible. Fire retardant treated wood may ***not*** *be used where the code requires noncombustible construction.*

(52m) "Fire-stop system, approved" means a fire-stop product or device that is tested and listed by an approved testing laboratory under ASTM E814 regarding the ability, the F-rating, to retard the passage of flame for a specific time period.

Note: See sub. (41c) for the definition of F-Rating.

(53) Fire window assembly. A fire window includes glass, frame, hardware and anchors constructed and glazed to give protection against the passage of flame.

(54) First floor. The first floor is the primary floor used in determining the number of stories of a building.

(55) Flame-spread classification. Flame-spread classification (FSC) is a comparative rating of the measure of flame-spread on a surface of a material or assembly as determined under conditions of tests and performance as specified in ASTM E-84.

(56) Flame-spread rating. Refer to flame-spread classification.

(56a) Floor. The bottom or lower part of an enclosed space including any portions raised or depressed by not more than 3 feet from the designated principal level where the raised or depressed portion is treated architecturally as a part of the same principal level.

(57) Floor area. See "Area (net)."

(57a) Floor level. The upper surface of a floor treated architecturally as the designated principal floor at a given elevation.

Floors are not to be confused with stories. Floors must be designated as sub-basements, basements, groundfloors, stories, balconies or mezzanines. Only those floor levels meeting the requirements for stories are counted as stories. Where the code sets forth requirements related to floors, all floor levels are involved and where the code references stories, only those floor levels designated as stories are involved.

(57b) "Foam plastic" means a manufactured organic material used as a building material, insulation or sound-absorbing material.

(58) Foyer. An enclosed space and passageway into which aisles, corridors, stairways, or elevators may exit and from which the public has access to exits.

(58a) "Freestanding freezer and cooler" means equipment with an aggregate floor area of less than 400 square feet used to provide a controlled environment at 50°F. or less for storing, displaying or merchandising of products. The freezers and coolers are installed in a building or structure for weather protection and do not rely upon the building or structure for lateral or vertical support, except for the floor load.

Note: Freezers and coolers which do not meet this definition are considered refrigerated facilities. See s. COMM 51.06 (7)(a) for additional requirements.

(58b) "Freezer warehouse" means a building or structure designed and operated at a temperature of 32°F. or below and adapted to the reception and storage of goods, products and merchandise.

(59) Front yard. See "Yard (front)."

(60) Fuel contributed classification. Fuel contributed classification (FCC) is a comparative measure of the fuel contribution of a material or an assembly in the flame-spread test per ASTM E-84.

(61) Furnace. A completely self-contained direct-fired, automatically controlled, vented appliance for heating air by transfer of heat of combustion through metal to the air and designed to supply heated air through ducts to spaces remote from the appliance location.

(62) Furnace (duct). A suspended direct-fired heating appliance normally installed in air ducts. Air circulation is provided by a blower not furnished as part of the appliance.

(63) Grade (at building). Elevation of surface of paved or unpaved ground adjacent to wall of a building.

(64) Grade, "exit discharge" means the elevation of the finished exterior surface of paved or unpaved ground directly below any exit discharge door sill.

The exit discharge grade is the grade elevation directly below the exit door. If an unenclosed bridge is constructed between the exit door and grade, the exit discharge grade is the grade elevation under the bridge directly below the exit door, not the grade elevation at the end of the bridge.

(65) Gravity exhaust ventilation. See "Ventilation (gravity exhaust)."

(66) Gross area. See "Area (gross)."

(67) Ground floor. A ground floor is that level of a building on a sloping or multilevel site which has its floor line at or not more than 3 feet above exit discharge grade for at least one-half of the required exit discharges.

(67a) Habitable room. Any room or enclosed floor space arranged for living and/or sleeping purposes.

All bedrooms, living rooms, and sleeping rooms are considered habitable. If a living unit has more than one living room (living room, family room, recreation room, den, etc.), only one of the living rooms need meet the requirements for providing the windows required by s. COMM 57.13. Any other "habitable" requirements must be met. Bathrooms, kitchens, dining rooms, closets and other accessory rooms are not considered as habitable rooms.

(68) Hazardous piping. See "Piping (hazardous)."

(68a) "Health care facility" means both hospital or nursing home.

(69) Heating system. Any combination of building construction, machinery, devices or equipment, so proportioned, arranged, installed, operated, and maintained as to produce and deliver in place the required amount and character of heating service.

(70) Height (building). Height of a building is measured from the average of the exit discharge grade elevation of all required first story exits to the top of a level roof or to a point 1/2 of the distance between the intersection of the exterior wall surface (extended) with the roof surface, and the highest part of the roof but not to include penthouses.

Note: For exceptions to penthouses see definition "Stories, Number of."

(71) Hollow bonded wall. See "Wall (hollow bonded)."

(71k) "**Home occupation**" means any business, profession, trade or employment conducted in a person's dwelling which may involve that person's immediate family or household and a maximum of one other unrelated person, but does not include a business involving:

1. Explosives, fireworks or repair of motor vehicles; or
2. More than 25% of the habitable floor area of the dwelling.

(71m) "**Hospital**" means any building, structure, institution or place used for the maintenance and operation of facilities for the diagnosis, treatment of and medical or surgical care for 3 or more non-related individuals hereinafter designated patients, suffering from illness, disease, injury or disability, whether physical or mental, and including pregnancy and regularly making available at least clinical laboratory services, and diagnostic x-ray services and treatment facilities for surgery, or obstetrical care, or other definitive medical treatment.

(71n) "**Household**" means those persons who live together in the same dwelling and treat the dwelling as their permanent home or residence.

(71p) "**Independent inspection agency**" means any person, firm, association, partnership or corporation, other than a municipal corporation that performs certified inspections under this code.

(72) Inner court. See "Court (inner)."

(73) Inner lot line court. See "Court (inner lot line)."

(74) Intake (outside air). See "Outside Air Intake."

(75) Interior balcony. See "Balcony (interior)."

(75a) "**Interior finish**" means the exposed interior surfaces of buildings, including, but not limited to fixed or movable walls and partitions, columns, ceilings, and floors.

(a) "*Class A interior finish*" includes any material classified at 25 or less on the flame spread test scale and 450 or less on the smoke test scale in accordance with ASTM E 84.

(b) "*Class B interior finish*" includes any material classified at more than 25 but not more than 75 on the flame spread test scale and 450 or less on the smoke test scale in accordance with ASTM E 84.

(c) "*Class C interior finish*" includes any material classified at more than 75 but not more than 200 on the flame spread test scale and 450 or less on the smoke test scale in accordance with ASTM E 84.

(d) "*Class I interior floor finish*" includes any material with a minimum critical radiant flux of 0.45 watts per square centimeter as determined in accordance with ASTM E 648.

(e) "*Class II interior floor finish*" includes any material with a minimum critical radiant flux of 0.22 watts per square centimeter as determined in accordance with ASTM E 648.

(76) Jacketed stove. See "Stove (jacketed)."

(76a) Landowner means any person holding fee title, an easement or other interest in property which allows the person to undertake land disturbing construction activity on the property.

(76b) Living unit. Any enclosed floor space consisting of one or more habitable rooms (with or without accessory rooms) used by a person or family.

(77) Lobby. An enclosed space into which aisles, corridors, stairways, elevators or foyer may exit and provides access to exits.

(78) Lot line. A legally established line dividing one lot, plot of land or parcel of land from an adjoining lot or plot of land or parcel of land.

(79) Major apparatus. Central air-handling equipment supplying more than one occupancy or rooms and heat-producing equipment generating heat for the heating and ventilating system.

(79m) Masonry. A construction composed of separate units such as brick, block, hollow tile, stone or approved similar units or a combination thereof, laid up or built unit by unit and bonded by approved manner.

(79r) "Mausoleum" means a building, structure or part of a building or structure that is used or intended to be used for the burial of human remains.

(80) "Mausoleum space" means a niche, crypt or specific place in a mausoleum that contains or is intended to contain human remains.

(80a) "Means of egress" means a continuous and unobstructed way of exit travel from any point in a building or structure to a street, alley, court or a public way. A means of egress consists of the exit access, the exit and the exit discharge. A means of egress includes the vertical and horizontal ways of travel and includes intervening room space, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, horizontal exits and courts.

(81) Mechanical ventilation. See "Ventilation (mechanical)."

(81m) "Membrane penetration" means an opening made through one side of an assembly that is a building element as listed in Table 51.03.

Note: An example of a membrane penetration is a recessed outlet box penetrating the gypsum wallboard (the gypsum wallboard is the "membrane") on one side of stud wall construction.

(82) "Mezzanine" means an intermediate floor level, either open or enclosed.

Note: See also sub. (122), "stories, number of" and s. COMM 51.02 (14) pertaining to the determination of the number of stories.

(82a) "Mini-storage building" means an unoccupied compartmentalized building used for storage.

(83) Net area. See "Area (net)."

(84) Nonbearing wall. Refer to "Wall (exterior)" or "Partition."

(85) Noncombustible construction. An assembly such as a wall, floor or roof having components of noncombustible material.

(86) Noncombustible material. A noncombustible material is one which, in the form in which it is used, meets one of the requirements par. (a) or (b) listed below. Materials used adjacent to or in contact with heat-producing appliances, warm air ducts, plenums and chimneys shall be classified as noncombustible only on the basis of requirement par. (a). Noncombustible does not apply to the flame-spread characteristics of interior finish or trim materials. No material shall be classed as noncombustible building construction material which is subject to increase in combustibility or flame-spread classification (FSC) beyond the limits herein established through the effects of age, moisture or other atmospheric conditions.

Note: The federal trade commission does not consider ASTM E-84 as an accurate indicator of the performance of cellular plastics used in building construction under actual fire conditions, and that it is only valid as a measurement of the performance of such materials under specific, controlled test conditions. The 25 flame-spread rating is not intended to reflect hazards presented by such products under actual fire conditions. The federal trade commission considers that under actual fire conditions, such products, if allowed to remain exposed

or unprotected, will under some circumstances produce rapid flame spread, quick flash-over, toxic or flammable gases, dense smoke and intense and immediate heat and may present a serious fire hazard.

(a) Materials which pass the test procedure of ASTM E-136 for defining noncombustibility of elementary materials when exposed to a furnace temperature of 1,382° F. for a minimum period of 5 minutes, and do not cause a temperature rise of the surface or interior thermocouples in excess of 54° F. above the furnace air temperature at the beginning of the test and which do not flame after an exposure of 30 seconds.

(b) Materials having a structural base of noncombustible materials as defined in par. (a), with a surfacing not more than 1/8 inch thick which has a flame-spread classification (FSC) not greater than 50 when tested in accordance with ASTM E 84.

(86a) "**Nursing home**" means any building, structure, institution or place which provides 24-hour services including board and room to 3 or more unrelated residents who because of their mental or physical condition require nursing care or personal care in excess of 7 hours a week. The term "nursing home" wherever used in chs. COMM 50-64, includes nursing and convalescent homes, skilled nursing facilities, infirmaries in homes for the aged, and intermediate care facilities of 15 beds or more.

(87) Occupancy or use. The purpose for which a building, structure, equipment, materials, or premises, or part thereof, is used or intended to be used as regulated in this code.

(88) Occupied. Refers to any room or enclosure used by one or more persons for other than incidental maintenance.

(89) Open spaces. Front (setback), rear and side yards, exit courts, outer courts, and outer lot line courts on the same property with a building as regulated by this code.

(89g) "**Outdoor event**" means an event held at a location generally without a permanent structure and may include organized sports games, home tours, auctions, picnics, concerts, art shows, fairs, or any similar, infrequent, short-term event.

(90) Outdoor openings. May be doors, windows or skylights located in outside walls or roof and can be opened to provide natural ventilation to the occupied space.

(90g) "**Outdoor toilet**" means either a permanently constructed toilet with a disposal cavity, or a portable toilet provided where either a public sewer is unavailable or where additional toilet fixtures are temporarily needed to meet the required number for an outdoor event.

Note: A privy may also be referred to as an outdoor toilet.

(91) Outer court. See "Court (outer)."

(92) Outer lot line court. See "Court (outer lot line)."

(93) Outlet (supply opening). An opening, the sole purpose of which is to deliver air into any space to provide heating, ventilating or air conditioning.

(93a) "**Outpatient surgical facility**" means a facility devoted to the performance of surgical procedures utilizing inhalation anesthetics without anticipation of the overnight stay of patients.

(94) Outside air. Air that is taken from outside the building and is free from contamination of any kind in proportions detrimental to the health or comfort of the persons exposed to it.

(95) Outside air intake. Includes the ducts and outdoor openings through which outside air is admitted to a ventilating, air conditioning or heating system.

In addition to the intakes listed, windows are also considered as outside air intakes where ventilation is provided by openable wall openings as permitted by Chapter COMM 64, and for habitable rooms in Chapters COMM 57 and 58.

(96) Panel wall. See "Wall (panel)."

(97) Partition. A partition is an interior nonbearing vertical element serving to enclose or divide an area, room or space. Portable or demountable partitions requiring tools for installation or removal are considered partitions not furniture.

(98) Party wall. See "Wall (party)."

(99) "Penthouse" means an enclosed or partially enclosed structure extending above a roof of a building or structure and enclosing a stairway, tank, elevator, machinery, mechanical equipment or other apparatus and not used for human occupancy.

(100) Pier. An isolated column of masonry or concrete. A section of bearing wall not bonded on the sides into adjoining masonry shall be considered to be a pier when its horizontal dimension measured at right angles to the thickness does not exceed 4 times the thickness.

(101) Pilaster. A projection of masonry for the purpose of bearing concentrated loads, or to compensate for reduction of wall section by chases, openings or recesses, or for the purpose of stiffening the wall against lateral forces. (See also "Buttress.")

(102) "Piping, hazardous" means any service piping conveying flammable or toxic gases or liquids.

See COMM 64.41 (4) commentary.

(102a) "Place of abode" means a residential building or part of a residential building used as follows:

(a) Occupied as a residence of 3 or more families living independently or occupied by 2 such families and used also for business purposes; or

(b) Occupied for sleeping or lodging purposes by 3 or more persons not members of the same family.

Note: Examples of places of abode include but are not limited to apartment buildings, garden apartments, rowhouses, townhouses, condominiums, hotels, motels, rooming houses, dormitories, convents, monasteries, homes for the aged and certain community-based residential facilities.

(102b) Place of employment. The term "place of employment" includes every place, whether indoors or out or underground and the premises appurtenant thereto where either temporarily or permanently any industry, trade or business is carried on, or where any process or operation, directly or indirectly related to any industry, trade or business, is carried on, and where any person is, directly or indirectly, employed by another for direct or indirect gain or profit, but does not include any place where persons are employed in a) private domestic service which does not involve the use of mechanical power or b) farming.

(103) Porch. An unenclosed exterior structure at or near grade attached or adjacent to the exterior wall or any building, and having a roof and floor. (See also "Terrace" and "Balcony.")

(103g) "Privy" has the meaning given in s. COMM 83.02 (42).

Note: Section COMM 83.02 (42) defines a privy as a structure, not connected to a plumbing system, which is used by persons for the deposition of human body wastes.

(104) "Property line" means the following:

(a) A legally established line dividing one lot, plot of land or parcel of land from an adjoining lot or plot of land or parcel of land; or

(b) A permanent easement recorded with the county register of deeds, on file with the department, on adjoining property providing control over the property eased.

In addition to the legally established property line, the department will consider under certain circumstances, easement lines as the property line for code application purposes. An easement must be permanent and non-revocable.

Property lines under malls. *Occasionally the developer and owner of the anchor store create property lines dividing the shopping center for financial management purposes. Since shopping centers are created to operate as a single entity, the developer should not be penalized due to the creation of a property line rather than lease lines. Therefore shopping centers will be treated as a single building complex on a single property.*

If the adjoining property is owned by a government, rail road or a utility, where it is impossible to obtain an easement, the department will accept a letter from the adjoining property owner indicating that they have no present plans to dispose of the property, that they have no present plans to construct a structure on the property within 10 feet of the property line, and that they have no objections to a building being constructed within the setback limits of the code. Accompanying the letter from the adjoining property owner, a letter from the owner of the building under review must be submitted indicating that the owner will bring the building into compliance with the code at such time as the adjoining property is sold, or a building is constructed on the adjoining property within 10 feet of the property line.

(104a) "Public building" has the meaning as given in s. 101.01 (2) (g), Stats.

Note: Section 101.01 (2) (g), Stats., reads "'Public building' means any structure, including exterior parts of such buildings, such as a porch, exterior platform or steps providing means of ingress or egress, used in whole or in part as a place of resort, assemblage, lodging, trade, traffic, occupancy, or use by the public or by 3 or more tenants. When used in relation to building codes, 'public building' does not include a previously constructed building used as a community-based residential facility as defined in s. 50.01 (1g) which serves 20 or fewer unrelated residents or an adult family home certified under s. 50.032 (10 (b)."

(104m) "Public mausoleum" means a mausoleum that holds or is intended to hold the remains of more than 10 humans or a mausoleum in which at least one mausoleum space is offered for sale to the general public.

(105) Public thoroughfare. Any legally established street or alley as defined herein.

(105a) Remodeling. To remodel or alter, or both, means to change any building or structure which affects the structural strength, fire hazard, internal circulation, or exits of the existing building or structure. This definition does not apply to maintenance, reroofing, or alterations to the heating and ventilating or electrical systems.

(105e) "Recyclable material" means solid waste material prohibited for land disposal and incineration, that is separated, temporarily stored and collected. These materials include, but are not limited to, aluminum and glass containers, corrugated paper or container board, magazines, newspapers, office paper, foam polystyrene packaging, and plastic or steel containers.

(106) Required. A term for mandatory use under the provisions of this code.

(106a) Required exit corridor. See "Corridor (Required Exit)."

(107) Restrained support. A flexural member where the supports or the adjacent construction, or both, provides complete or partial restraint against rotation of the ends of the member or partial restraint against horizontal displacement, or both, when subject to a gravity load or temperature change, or both.

(108) Retaining wall. See "Wall (retaining)."

(109) Return (or exhaust opening). Any opening, the sole purpose of which is to remove air from any space being heated, ventilated or air conditioned.

(110) Roadway. That portion of a public thoroughfare devoted to vehicular traffic, or that part included between curbs.

(111) Roof. The structural cover of a building with a slope range bearing from horizontal to a maximum of 60° to the horizontal.

(112) Roof covering. Refers to the covering applied over the roof construction for the purpose of weather or fire resistance.

(113) Roof coverings (fire-retardant). See "Fire-Retardant Roof Coverings."

(114) Room. A space within a building completely enclosed with walls, partitions, floor and ceiling, except for openings for light, ventilation, ingress and egress.

(114a) "Rowhouse" means a place of abode not more than 3 stories in height, arranged to accommodate 3 or more attached, side by side or back to back living units.

(115) "Setback" means the distance between the property line or public thoroughfare, and the nearest part of the building, as measured perpendicular to the bisector of the angle formed by the intersection or projected intersection of the building face with the property line or another building face.

Setback. The intent of setbacks in COMM Tables 51.03A and B is to prevent the effects of fire from spreading between properties and between separate buildings on the same property. The intent was to not include gutters, downspouts, outdoor lighting fixtures, signs and similar attachments as parts of a building, thus they may project into the required setback distance. Terraces, slabs and stoops may be located within required setbacks providing they are level with or not greater than 7 inches above adjacent grade at any point and are in contact with the ground to prevent an exposed cavity which could promote fire or smoke. Grade changes from the terrace shall be of a gradual slope. For COMM Tables 51.03A and 55.02 (2m)(a) purposes ***open*** *cantilevers may project 2 feet into the required setback between property lines. No projection is allowed to encroach into the setback requirements between buildings on the same property. Non-cantilevered appendages such as decks, porches, ramps, etc., are considered part of the building proper and may not project into building setback requirements.*

(116) Shaft. A vertical opening in a building extending through one or more stories and/or roof, other than an inner court.

(117) Shall. A term for mandatory use under the provisions of this code.

(117m) "Shelter facility" has the meaning given in s. 46.97 (1)(d), Stats. Section 46.97 (1)(d), Stats., reads: "Shelter facility means a temporary place of lodging for homeless individuals or families."

(118) Signs. A structure that is intended, designed, or used for advertising, display, identification, announcements, or related purposes; this includes signs, screens, billboards, and other advertising devices of any type.

(119) Simple support. A flexural member where the supports or the adjacent construction, or both, allows free rotation of the ends of the member and horizontal displacement when subject to a gravity load or a temperature change, or both.

(119a) "Sleeping area" means the area of residential buildings in which bedrooms or sleeping rooms are located. Bedrooms or sleeping rooms separated by other use areas such as kitchens or living rooms, but not bathrooms, are considered as separate sleeping areas. Each individual room or suite of rooms in hotels, motels, dormitories or congregate living facilities is considered a separate sleeping area.

(119b) "Smoke detector" means a device which detects particles or products of combustion other than heat.

(119c) "Solid-fuel equipment" means equipment burning solid rather than gas or liquid fuel.

Note: Typical solid fuels are coal and wood.

(120) "Space heater" means a fuel-fired vented, self-contained free-standing or wall recessed heating appliance.

(120a) "Spandrel" means that portion of wall filling the space between the top of a window in one story and the sill of the window in the story above.

(120am) "Specialty event center" has the meaning given in s. 101.128 (1) (g), Stats.

Note: Section 101.128 (1) (g), Stats., defines speciality event center as an open arena used for rallies, concerts, or other assemblies with no permanent structure for such assembly. Also refer to sub. (89g) for definition of an outdoor event.

(120b) "Step" means one riser and one tread.

(121) Stories, number of. The number of stories of a multistory building includes all stories except the basement, ground floor, attic or interior balcony and mezzanine floor. (Also see COMM 51.02 (14).)

(122) Story. The space in a building between the surfaces of any floor and the floor next above or below, or roof next above, or any space not defined as basement, ground floor, mezzanine, balcony, penthouse or attic. (Also see "Stories, Number of.")

(124) "Street" means any legally established public thoroughfare or all-weather hard surface area 30 feet or more in width whether designated or not by name or number such as avenue, boulevard, circle, court, drive, lane, place, road or way. Streets must extend at least 50% of the length of the side of the building and must be accessible to fire fighting equipment.

The code includes many occupancy requirements where streets and fire department access roads are mandated with specific requirements on such things as width and overhead clearance, but in no case are such things as grades, curves (horizontal or vertical), or slopes codified. Most municipalities will have specifications or references to the standards used within the municipality and we rely on them to provide you with requirements. The designer and owner must work with the local municipality to assure all roads and streets which are required for use by the fire apparatus will be designed, built, and maintained for that usability.

In addition to those paved areas indicated, the department will accept parking lots on the property as streets. An all-weather hard surface may include a properly prepared gravel surface.

***Question:** Streets must be 30 feet wide, and the space between the street and the building must be unobstructed. Can vehicles be parked on the street?*

***Answer:** Other than municipal streets, the streets normally provided for a building are adjacent parking lots. The obstructions to firefighting, as prohibited by code, are intended to be constructed features such as buildings and fences, and natural features such as cliffs, high retaining walls, lakes and streams. Motor vehicles have not been usually treated as such an obstruction, as they can be moved if necessary. It should also be considered that local fire departments can, by ordinance, create fire lanes, thereby limiting parking. Prohibition of parking by the Division of Safety & Buildings is not necessary. COMM 57.02 (3)(b) specifically prohibits parked vehicles **on** required streets and access roadways. The intent of the code is to maintain a 20 foot wide fire department access roadway for firefighting purposes.*

Thus a 20-foot wide unobstructed fire department access roadway shall be maintained as required by COMM 57.02 (3).

Building and Structure plan review will not cite parking shown on streets wider than 20 feet or between said street and buildings as an COMM violation. Local fire departments or other local agencies may, by local ordinance, create fire lanes restricting or prohibiting parking.

***Question:** What are the requirements for an access road or drive from the city thoroughfare to a code-required street?*

***Answer:** The minimum requirement for access roads or drives from the city thoroughfare to the code-required street is that they must be at least 10 feet wide, unobstructed, with an all-weather surface. The edge of the drive shall be no closer than 10 feet to the building wall of the building for which the street is provided. The access road may not be considered as other than a connecting link unless it is at least 20 feet wide for a fire department access road or 30 feet wide as required for a street.*

(125) Structure. A structure is an assembly of materials forming a construction for occupancy or use meeting the definition of place of employment or public building.

Note: Structures include, among others, buildings, stadiums, tents, reviewing stands, observation towers, radio and television towers, water tanks, piers, wharves, shelters, canopies, and display signs.

(125m) "Stud" means an upright member of a framing wall, having a spacing of less than 48 inches on center, and which is primarily intended to have sheathing fastened to it.

(126) Support (restrained). See "Restrained Support."

(127) Support (simple). See "Simple Support."

(128) Tempered air. Air transferred from heated area of building.

(129) Tempered outside air. Outside air heated before distribution.

(130) Terrace. An unenclosed exterior structure at or near grade having a paved, floored, or planted platform area adjacent to an entrance or to the exterior walls for a building or structure and having no roof.

(130d) "Through penetration" means an opening that passes through an entire assembly that is a building element as listed in Table 51.03.

(130g) "Toilet room" means a room in a permanent structure solely designated for sanitary fixtures which ensures privacy of their use. A toilet room may include a water closet, urinal and a lavatory.

(130m) "Townhouse" means an apartment building where each living unit is served by an individual exterior exit within 3 feet of the exit discharge grade.

(131) Treated wood (fire-retardant). See "Fire Retardant-Treated Wood."

(132) Unit heater (high static pressure type). A direct-fired suspended or floor standing, self-contained, automatically controlled and vented, heating appliance having an integral means for circulation of air against 0.2 inch or greater static pressure.

(133) Unit heater (low static type). A direct-fired suspended, self-contained automatically controlled, vented heating appliance, having integral means for circulation of air by means of a propeller fan or fans.

(134) Veneered wall. See "Wall (veneered)."

(135) Ventilating system (exhaust). Any combination of building construction, machinery, devices or equipment, designed and operated to remove harmful gases, dusts, fumes or vitiated air, from the breathing zone of employes and frequenters.

(136) Ventilation. The process of supplying or removing air by natural or mechanical means, to or from any space.

(137) Ventilation (gravity exhaust). A process of removing air by natural means, the effectiveness depending on atmospheric condition, such as difference in relative density, difference in temperature or wind motion.

(139) Vertical exit. A means of egress used for ascension or descension between 2 or more floors, or other levels, and shall include approved exterior stairways, automatic (moving) stairways, fire escapes, ramps, stairways, and smokeproof stair towers.

(139a) Volume (total). The "total volume" (cube or cubage) of a building is the actual cubic space enclosed within the outer surfaces of the outside or enclosing walls and contained between the outer surfaces of the roof and the underside of the lowest floor. The volume of structures without enclosing walls (canopies, roofed shelters and similar structures) will be computed by projecting imaginary vertical planes as the enclosing walls at the outer surface of the exterior supports or columns. For cantilevered structures with interior supports, the imaginary vertical planes will be projected at the farthest roof projection or overhang.

Note: The definition of total volume requires the cube of dormers, penthouses, vaults, pits, enclosed porches and other enclosed appendages to be included as a part of the cube of the building. It does not include the cube of courts or light shafts, open at the top, or the cube of outside steps, cornices, parapets, or open porches or loggias.

(140) Wall. A structural element which is vertical or within 30° of vertical, serving to enclose space, form a division, or support superimposed weight.

(141) Wall (bearing). Any wall which supports a load in addition to its own weight.

(142) Wall (cavity). A wall built of masonry units or of plain concrete, or a combination of these materials, so arranged to provide an air space within the wall, and in which the facing and backing (inner and outer parts) of the wall are tied together with metal ties.

(143) Wall (curtain). An exterior nonbearing wall.

(144) Wall (division).

(a) *Building division.* A wall used for separation between 2 buildings on the same property identical in construction to a party wall.

A building division wall must be unpierced. See party wall commentary.

(b) *Fire division.* A wall extending from the lowest floor level to or through the roof to restrict the spread of fire.

A fire division wall may be pierced provided the openings are protected by appropriate fire door or fire window assemblies.

(145) Wall (exterior). Any outer enclosing wall of a building or structure.

(146) Wall (framing). Wall framing shall include columns, studs, beams, girders, lintels and girts.

(147) Wall (hollow bonded). Wall built of masonry units with or without any air space within the wall, and in which the facing and backing of the wall are bonded together with masonry units.

(148) Wall (nonbearing exterior). Wall which supports no vertical load other than its own weight.

(148a) Wall (nonbearing interior). See "Partition."

(149) Wall (panel). An exterior nonbearing wall in skeleton construction.

(150) Wall (parapet). That part of a wall entirely above the roof line.

(151) Wall (party). Walls used for separation between 2 buildings on the property line between adjoining properties.

A party wall is a jointly owned wall located on a property line. Because the wall is located on a property line and because walls within 5 feet of property lines must be unpierced, no openings are permitted in a party wall.

(152) Wall (retaining). Wall used to resist laterally imposed pressures.

(153) Wall (veneered). Wall having facing which is attached to the backing but not so bonded as to exert common action under load.

(153a) "Warehouse" means a building or structure used primarily for the reception and storage of goods and merchandise.

(154) Yard (front). An open, unoccupied space unobstructed to the sky, extending across the full width of a lot, or plot of land between the street line and the base of a front building wall. Unenclosed terraces, slabs or stoops without roofs or walls may project into this open space.

Standards for Classes of Construction

COMM 51.015 SCOPE.

This chapter covers minimum standards for common types of building designs being constructed. This chapter does not specifically include standards for uncommon building designs such as shells, domes, space frames, inflatable and similar types of designs. The standards contained in this chapter shall be used as a guide for uncommon building designs to achieve the degree of safety intended by these standards.

COMM 51.02 GENERAL REQUIREMENTS.

(1) FIRE-RESISTIVE RATINGS. The fire-resistive ratings shown in "Classes of Construction" Table 51.03-A are to satisfy the structural integrity end point for the time specified. For heat transmission end point requirements see s. COMM 51.042 (5).

See COMM 50.12 (4) commentary for additional requirements. The department will not accept any deviations in construction from the tested and listed design unless a letter from the testing laboratory is submitted agreeing to the design modification. The department will accept, however, insulation in 1-hour rated walls and partitions even though the tested and listed design does not indicate insulation. This exception does not extend to floor/ceiling or roof/ceiling assemblies. The ceiling membrane of floor/ceiling and roof/ceiling assemblies cannot be penetrated with lighting fixtures or HVAC diffusers and grilles unless the tested and listed assembly permits such penetration, and then the penetrations are subject to the limitations of the tested and listed design.

(2) SUBSTITUTE. Substitution of a building element fire-resistive rating will be permitted in any class of construction providing it is equal to or better than the required fire-resistive rating as specified in Table 51.03-A.

(a) Construction requiring the use of noncombustible material shall not be replaced by combustible construction regardless of fire-resistive rating unless mentioned specifically under classes of construction standards.

(b) Noncombustible construction may be substituted for combustible construction provided the fire-resistive rating indicated in Table 51.03-A is equal to or better than that noted for combustible construction.

Note: See COMM 64.41 (1) for requirements pertaining to combustible ceiling materials used in conjunction with air-handling plenums.

(c) Fire-retardant treated wood exposed to high humidity or accelerated weathering shall be pressure impregnated and so identified. Subsequent to treatment, lumber 2 inches or less in thickness shall be dried to a moisture content of 19% or less, and plywood to a moisture content of 15% or less.

Note: The department will accept fire-retardant treated lumber and plywood which meet the standards of the American Wood Preservers Association, "Fire-Retardant Treatment by Pressure Processes," and ASTM D 2898, "Standard Methods of Test for Durability of Fire-Retardant Treatment of Wood."

(3) FLOOR FRAMING.

(a) *General.* All floor framing shall satisfy the requirements of Table 51.03-A, unless more restrictive requirements are noted under the occupancy chapters of this code.

Tiered floors such as those found in lecture halls and music education rooms will fall under the requirements for raised platforms. A temporary platform is defined as one which is to be used for not more than 30 consecutive days. The department will require that the temporary platform be removed when not in use. If the platform remains in place more than 30 consecutive days, it will be considered a permanent raised platform. The lower construction standards for temporary platforms is intended to apply to platforms erected for specific events purposes such as band or choir risers on a stage or gym floor, tiered telephone banks for a telethon, speaker platforms elevated above the audience floor, etc.

(b) *Permanent raised platforms.*

1. Permanent raised platforms may be constructed of the types of materials and fire-resistive properties as specified in:

a. Table 51.03-A line 3 or 4 for the appropriate class of construction and number of stories involved; or

b. Table 51.03-A line 18 for the appropriate class of construction, if the platform is directly supported by a structural floor system which satisfies the appropriate material and fire resistive properties as outlined in Table 51.03-A line 3 or 4.

2. Permanent raised platforms shall be designed and constructed to support the dead loads and live loads as specified in ss. COMM 53.10 and 53.11.

3. The highest floor level of a permanent raised platform which is constructed in accordance with subd. 1. b. may not be more than 3 feet above the structural floor.

4. The floor coverings of permanent raised platforms shall conform with s. COMM 51.07.

5. Spaces created between a permanent raised platform which is constructed in accordance with subd. 1. b. and the structural floor system supporting the platform may not be used for storage and other purposes, unless the platform floor system has at least a 1-hour fire resistive rating.

6. Open sides of raised platforms shall be guarded in accordance with s. COMM 51.162.

(c) *Temporary platforms.* Temporary raised platforms may be provided and shall be designed and constructed to support the dead loads and live loads as specified in ss. COMM 53.10 and 53.11. A temporary raised platform to be used for more than 30 consecutive days shall conform with par. (b), the requirements for permanent raised floors.

(4) EXTERIOR WALL CONSTRUCTION.

(a) All exterior walls which are in contact with the soil shall be of masonry or concrete except that all-weather wood foundations are permitted if constructed in accordance with the provisions outlined in s. COMM 53.64.

(b) Exposed exterior walls between the first floor structural system and grade shall be of masonry or concrete except as follows:

1. Walls may be constructed of material other than masonry or concrete providing the following conditions are satisfied:

a. The construction shall meet the requirements of Table 51.03-A for specified class of construction.

b. In buildings where the class of construction permits exterior walls to be of combustible construction, no floor level that is more than one level below the first floor framing system may have exterior walls constructed of combustible materials.

(c) 1. Except as provided in subd. 2., fenestration in-fill panels in the exterior walls of existing buildings of types 1, 2, 3, 5A and 5B construction meeting the percentage of openings requirements of Table 51.03-B shall be of noncombustible construction.

Question: *When does an infill panel become a wall (i.e., metal studs with metal skin infill for type 5b)?*

Answer: *The intent of COMM 51.02 (4) with regards to exterior wall construction (c) fenestration infill panels is tied to energy conservation requirements permitting existing buildings to increase their energy conservation by down sizing of windows and infilling of panels with insulation. The*

question that is posed is a question of new construction versus existing construction. The direct wording of COMM 51.02 (4)(c) reads fenestration infill panels in the exterior walls of existing buildings of types 1, 2, 3, 5a and 5b construction, meeting the percentage of opening requirements of Table 51.03-B shall be of noncombustible construction. This code section clearly indicates that this section may be used only for existing buildings and not new construction.

COMM 51.02 (4)(c) 1. is to be utilized only for existing buildings and not for new construction. *For the requirements of this section, existing buildings means any building of which the construction has been entirely completed. New building is defined as any building prior to the completion of construction.*

2. a. The studding and structural framework may be of fire retardant treated wood.

b. The interior finish of the in-fill panel may be of combustible materials providing the materials comply with the provisions of s. COMM 51.07.

c. Foam plastic insulation complying with the provisions of s. COMM 51.06 may be used in the construction of the in-fill panels provided the foam plastic is protected on both sides by an approved thermal barrier as specified in s. COMM 51.06 (3).

3. In-fill panels located in exterior walls required to have a fire-resistive rating need not be constructed to provide the hourly rating provided the panels satisfy the requirements of this section.

4. The exterior finish of the in-fill panel shall comply with the requirements of Table 51.03-A for the class of construction of the building in which the panel is located except that the exterior finish of in-fill panels located in buildings of types 5A or 5B construction need not be of masonry.

This allows infill panels in Type 5B buildings to be other than 6-inch masonry. The exterior finish of these panels must be noncombustible as per 1. above.

(5) INTERIOR WALL CONSTRUCTION.

(a) Openings in partitions and interior bearing walls shall be protected if such walls serve as required building division, fire division or fire separation walls.

1. Openings shall be protected by approved fire door or fire window assemblies as specified in ss. COMM 51.047 and 51.048, or fire damper or fire curtain door assemblies as specified in s. COMM 64.42.

Note: Openings in walls other than those specified above need not be protected except to satisfy structural integrity end point for the time specified.

(7) BUILDING LOCATIONS.

(a) When the distance between buildings located on the same property is less than 10 feet, the following shall apply:

1. Where the combined gross area for these buildings, including the area between buildings, is less than that allowable for one building, the exterior wall shall satisfy minimum requirements listed for class of construction in Table 51.03-A.

If the setback distance is violated, the buildings must be considered as a single building. The combined areas of the buildings (or occupant capacity) must be within the limits specified for one building. If the building requires a protection system, such as sprinkler or detection, the structures

must be provided with a common system. For instance, if a fire alarm is required, activation of a pull station in either of the structures will activate the alarms in all of the structures. The walls facing each other and within the less-than-required setback distance are considered interior partitions. When determining the area of the "building," you must also include the area between the two structures.

a. Buildings classified as wood frame under s. COMM 51.03 (7) or (8) shall have exterior walls with a fire-resistive rating of not less than that required for these buildings when satisfying the 10 feet to 30 feet distance to property line shown in Table 51.03-A.

2. Where the combined gross area for these buildings, including the area between buildings, is greater than that allowable for one building, one of the opposing walls shall be not less than a 4-hour fire-resistive rated fire division wall or building division wall, whichever applies. Where buildings are of different classes of construction, the lesser allowable gross area shall apply.

(b) Buildings on the same property may be located less than 30 feet from each other with no restriction on the percentage of wall openings, provided the combined gross area of the buildings, including the area between the buildings, is no more than the area permitted by the occupancy chapters of this code.

(8) INTERIOR BALCONY OR MEZZANINE. Interior balconies or mezzanine floors shall have fire-resistive ratings as required for the story in which it is located.

(9) IMBEDDED MATERIAL.

(a) *Structural members.* Pipes, wires, cables, ducts or other service equipment shall not be imbedded in the required fire-resistive protection of any structural member.

(b) *Assemblies.* Pipes, wires, cables, metallic ducts or other service equipment may be imbedded or installed:

1. As permited in approved fire-rated assemblies; or

2. In fire-resistive assemblies of 2-hour rating or less in buildings of Types No. 4 to 8 construction. The pipe, wire, cable, metallic duct or other service equipment shall be contained within the fire-resistive rated assembly.

(10) EXPOSED EXTERIOR STRUCTURAL COLUMNS AND FRAMING. The required fire-resistive hourly rating may be omitted on noncombustible columns and framing when the building does not exceed 2 stories and the fire separation to the center of a street, or to the property line or buildings on the same property, is greater than 30 feet.

(11) PROTECTION OF VERTICAL OPENINGS.

(a) Except as specified in ss. COMM 54.08, 55.09, 57.08 and in par. (b), stairways, elevator shafts and other vertical openings, which serve 2 or more floor levels, shall be enclosed with fire-resistive rated construction equal to or better than the hourly ratings specified in Table 51.03-A. Stairways serving as required means of egress shall comply with the requirements specified in s. COMM 51.18.

This general code provision requires that all shafts and openings connecting two or more floor levels be enclosed with fire-rated construction. There are exceptions to this basic requirement contained within this section as well as in various occupancy chapters of the code and as provided for atriums under COMM 52.07.

(b) *Exceptions.* Vertical openings need not be enclosed under the following conditions:

1. Serving and contained within individual living units;

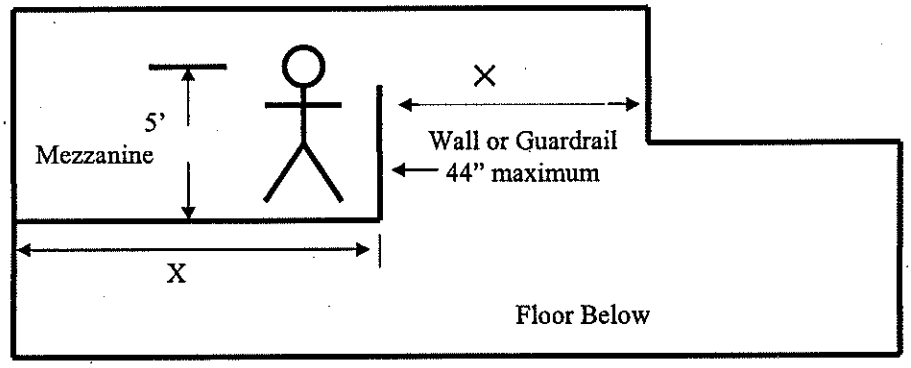
Exception No. 1 will allow any number of levels which are within an individual living unit to be connected by open stairs and shafts. Openings connecting floor levels outside of the individual living units in Chapter COMM 57 occupancies must meet exception No. 2 or No. 3 of this section, COMM 57.08 or COMM 52.07.

2. Serving raised or depressed areas, open mezzanines or open balconies contained within a single story;

Question: *The code allows several exceptions for omitting stair/shaft enclosures and allowing single exits from open mezzanines. What is an open mezzanine?*

Answer: *It is intended that the openness of the mezzanine provides the occupants with the ability to detect fire or other emergencies by sight, sound and/or smell. To accomplish this, the mezzanine must be open to the floor below and an adequate line of sight to the area below must be maintained.*

Thus to be considered open, all sides of the mezzanine other than exterior walls or fire division walls shall be open and unobstructed to the floor level below except for columns, and guardrails or walls which do not extend more than 44 inches above the mezzanine floor. An adjacent clear space equal to the depth of the mezzanine shall be maintained at eye level (5 feet) to provide a line of sight to the floor below.



3. Serving 2 floor levels in buildings containing chs. COMM 54 to 58 or 60 to 62 occupancies provided:

a. The opening is not a required means of egress; and

b. The opening is separated from any exit access corridor or exit stairway by fire-resistive rated construction with at least the hourly rating specified for fire-rated enclosures in line 20 of Table 51.03-A; or

Exception No. 3 will allow an opening unenclosed between any two adjacent floor levels in any occupancy covered by the code other than garages. Openings between floor levels in garages is covered only by COMM 59.17. Please note that the opening between two adjacent levels is permitted only if two restrictions are met: 1) the opening may not be used as a required means of egress, which means that a required exit stair or ramp may not be located in the unenclosed opening; and 2) the opening must be separated from exit access corridors and stairways by fire-

rated construction. The separation from exit access corridors and stairways will apply only on the upper floor level of the connected floors and will not be applied on the lower of the connected two floors. Please note, however, that this code section is not to be used as an exception to COMM 51.18, enclosed exit stairs. If the building in question requires stair enclosures per COMM 51.18, the stairways will have to be enclosed at all levels, including the levels connected by the open shaft. If open shafts other than open mezzanines are constructed in accordance with this code section, the shortened exit distances indicated by COMM 54.08 and COMM 57.08 will apply. See commentary diagrams in COMM 54.08.

Question: *Is an entry vestibule situated at an elevation level different from the main floors considered as a floor level for application of shaft enclosure requirements?*

Answer: *First a distinction must be made between a landing and an actual floor level.*

A landing is an unoccupied level surface used at the head or foot of stairs, at changes in directions in stairways or ramps, or as a place of rest between flights of stairs or lengths of ramps. Landings thus have no other use than that of providing a transitional area.

A floor level is an occupied horizontal surface that is used for some purpose.

Unoccupied landings that are no larger than necessary to perform the functions of exit will not be considered floor levels when applying the requirements of COMM 51.02 (11).

It should be noted that COMM 51.01 (56a) allows raised or depressed areas which are not more than 3 feet from the principle floor level to be considered as the same floor level. Thus, for COMM 51.02 (11) application, if COMM 51.01 (56a) criteria is satisfied, the vestibule will be considered part of the primary floor level, thus may be occupied and utilized.

4. As permitted by chs. COMM 54 through 62.

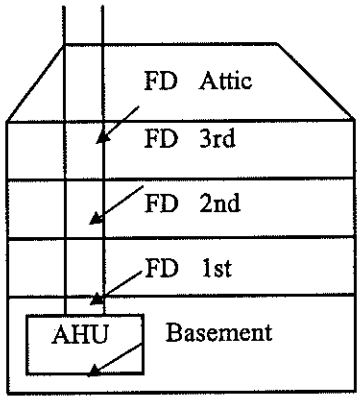
Question: *How should a vent shaft be protected to comply with this section?*

Analysis: *COMM 51.02 (11)(a) requires vertical openings which serve two or more floor levels to be enclosed with fire-resistive rated construction equal to or better than the hourly ratings specified in Table 51.03-A. Several of the occupancy chapters (such as 54.08, 55.09, 57.08, 58.23, 58.61, 60.34, 61.10) have provisions to allow open shafts in certain instances. Each of these exceptions will have to be evaluated independently. In general, if there are fire dampers at* ***every floor/ceiling****, each floor level is cut off from the other so there is no shaft. An exception to this is Health Care Facilities where all shafts are required to be enclosed by COMM (58.23 and 64.57) except when ducts extend through only one floor and fire dampers are located at each such point where the floor is pierced. (NFPA 90A-3-3.3.1)*

AHU - Air Handling Unit

FD - Fire Damper

A.



If fire dampers are installed at all floor ceiling openings, there is no shaft, so no problem.

The unoccupied attic level will be considered part of the upper level requiring shaft protection unless it is cut off from the upper level by a fire damper or rated cap such as in a stair enclosure roof/ceiling.

Answer: *Vent shafts are required to be enclosed by fire-resistive construction unless conditions specified by occupancy chapter exceptions are satisfied. Except for Health Care Facilities, a fire damper at each floor/ceiling penetration will be considered as sufficient protection to not consider the vent a shaft.*

(c) Openings in required exit enclosures shall be limited to exit doors serving public passageways and corridors or serving floors occupied by a single tenant.

(12) PARAPET WALLS.

(a) Parapet walls shall be provided on exterior walls closer than 10 feet to a property line or to other buildings on the same property except as exempted under subd. 4. Parapet walls shall satisfy the following requirements:

1. Parapets shall not be less than 2 feet in height;

2. The minimum thickness of masonry parapets shall be 8 inches;

3. Parapets shall have fire-resistive ratings as specified for exterior walls in Table 51.03-A; and

4. Parapets are not required on exterior walls which front streets and alleys or where exterior walls connect with roofs of noncombustible construction. For the purposes of this requirement, built-up roof coverings of a Class A rating, shall be considered as being noncombustible.

This code section requires that parapets be provided on exterior walls closer than 10 feet to property lines or other buildings on the same property. This does not apply to property lines between the property and a public street or thoroughfare, nor does it apply where the roof of the building is of noncombustible construction. In order for a roof to be considered noncombustible, the roof deck and roof framing must be noncombustible. Combustible roof coverings, carrying an

Underwriter's Laboratories Class A rating, may be used on the noncombustible deck and framing system.

(b) All parapet walls shall be properly coped with noncombustible weatherproof material.

(13) FIRE-DIVISION WALLS.

(a) Fire division walls shall have not less than a 4-hour fire-resistive rating as specified in s. COMM 51.04 and shall comply with one of the following conditions:

Fire-division walls must carry a 4-hour rating which typically requires the use of masonry or concrete. There are some tested and listed 4-hour wall assemblies consisting of steel studs and multiple layers of gypsum wallboard and such walls, if installed according to the listing, may be used. If such stud and gypsum wallboard fire walls are used, care must be exercised in the selection of fire-door assemblies to protect openings in the wall. Openings in 4-hour fire walls must be protected with 3-hour, A-labeled fire-door assemblies. Most, if not all, 3-hour, fire-door assemblies require installation in masonry walls, and the listing of the fire-door assemblies indicate that if the door assemblies are placed in walls of other than masonry, they will carry only a 1 1/2-hour rating. A rating of 1 1/2 hours will not meet the opening protection requirements of the code.

A fire-division wall must extend from an exterior wall to an exterior wall and from the foundation through the roof, extending 3 feet above the roof. The wall must be vertical and no horizontal offsets are permitted.

1. a. Except as provided in subpar. b, the fire division wall shall extend 3 feet above the roof. Where a difference in roof elevations occurs at the fire division, the parapet height shall be measured from the lower roof elevation.

b. Where a difference in roof elevations occurs at the fire division wall in buildings of Type No. 4 construction with combustible exterior walls, Type No. 7 or No. 8 construction, the fire-division wall shall extend above the lower roof to the high roof elevation and shall be unpierced. In all cases, the fire-division wall shall extend at least 3 feet above the lower roof elevation.

2. The wall shall connect and make tight contact with roof decks of at least 2-hour fire-resistive noncombustible construction on both sides of the wall; or

3. The wall shall connect and make tight contact with roofs of noncombustible construction on both sides of the walls, and the roofs shall be noncontinuous at the wall. For the purposes of this requirement, built-up roof coverings, including those of a Class A rating, shall be considered as being combustible and do not conform with the conditions of this requirement.

The 3-foot extension above the roof is measured from the roof to the top of the wall. If the wall is separating portions of a building with different roof elevations, the 3-foot extension is measured from the lower roof. If the higher of the two building segments has walls of combustible construction, the fire wall must extend to the upper roof elevation even if the roof elevation difference is more than 3 feet.

There are two exceptions to the need for a 3-foot extension above the roof. Please note that both of the exceptions require that a roof exist on both sides of the fire wall and that the elevations of the roof on both sides of the fire wall are the same. If there is a roof elevation difference, the 3-foot extension is required.

*The first exception allows omission of the 3-foot extension of the wall if the wall meets and makes tight contact with 2-hour rated roof **decks** on both sides of the wall. This would typically require that the roof deck be concrete or precast concrete. In this case, please note that only the roof deck need be 2-hour rated. The framing for the roof deck need not be fire rated. A 2-hour rated roof/ceiling assembly will not satisfy the requirement for a 2 hour rated deck.*

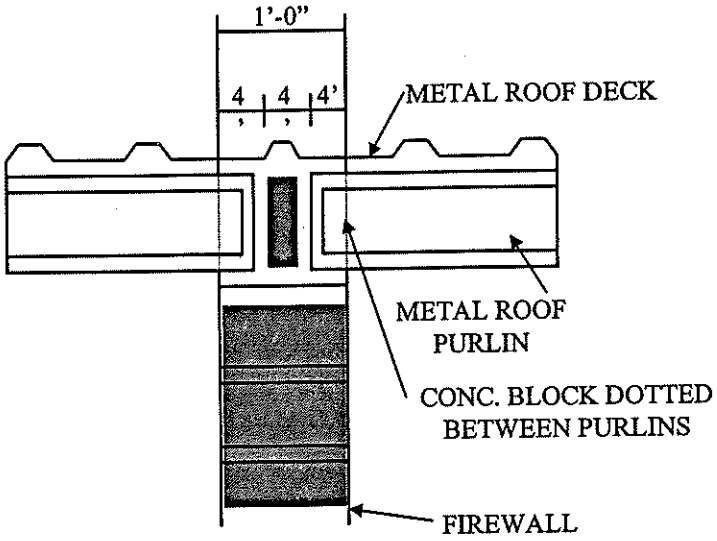
*The second exception allows omission of the 3-foot extension if the fire wall meets and makes tight contact with **roofs** of noncombustible construction. In this case, the entire roof system, framing, deck and roof covering must be totally noncombustible. Built-up roofing, even if carrying an Underwriters Laboratories Class A rating, is not permitted. A single ply roof is still considered built-up.*

***Question**: If a fire division wall occurs at a change in roof elevation but the change in elevation is less than 3 feet, must the parapet still extend 3 feet above the lower roof?*

***Answer:** No. Fire walls meeting and making tight contact with roofs of totally noncombustible construction on both sides of the wall, even if the roofs are at different elevations, need be extended only to the upper roof elevation if the elevation difference is 3 feet or less. If the elevation difference exceeds 3 feet, or if the roof construction is not totally noncombustible on one or both sides, the fire wall extension or parapet must comply with other provisions of COMM 51.02 (13).*

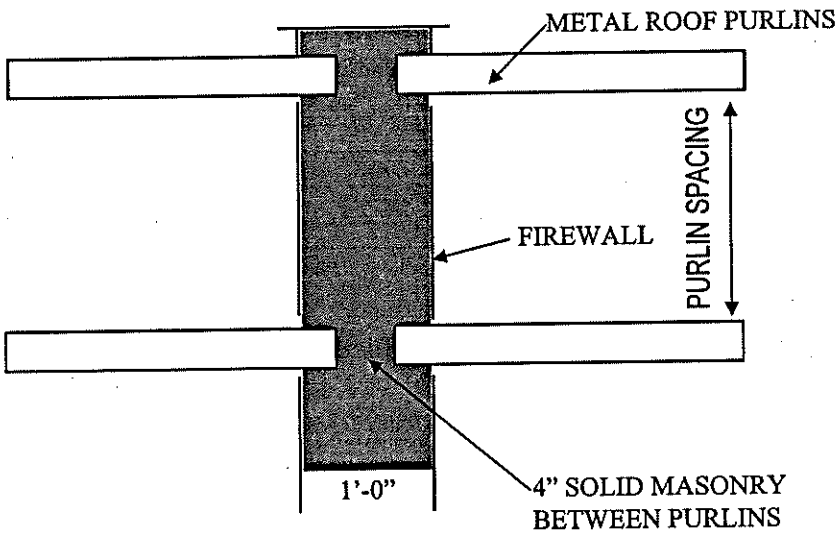
(b) Structural members shall not continue through or over the fire wall.

All building framing must be discontinuous at the fire wall such that if a fire causes failure of the framing system on one side of the wall, that failure will not affect the framing system on the other side of the wall.

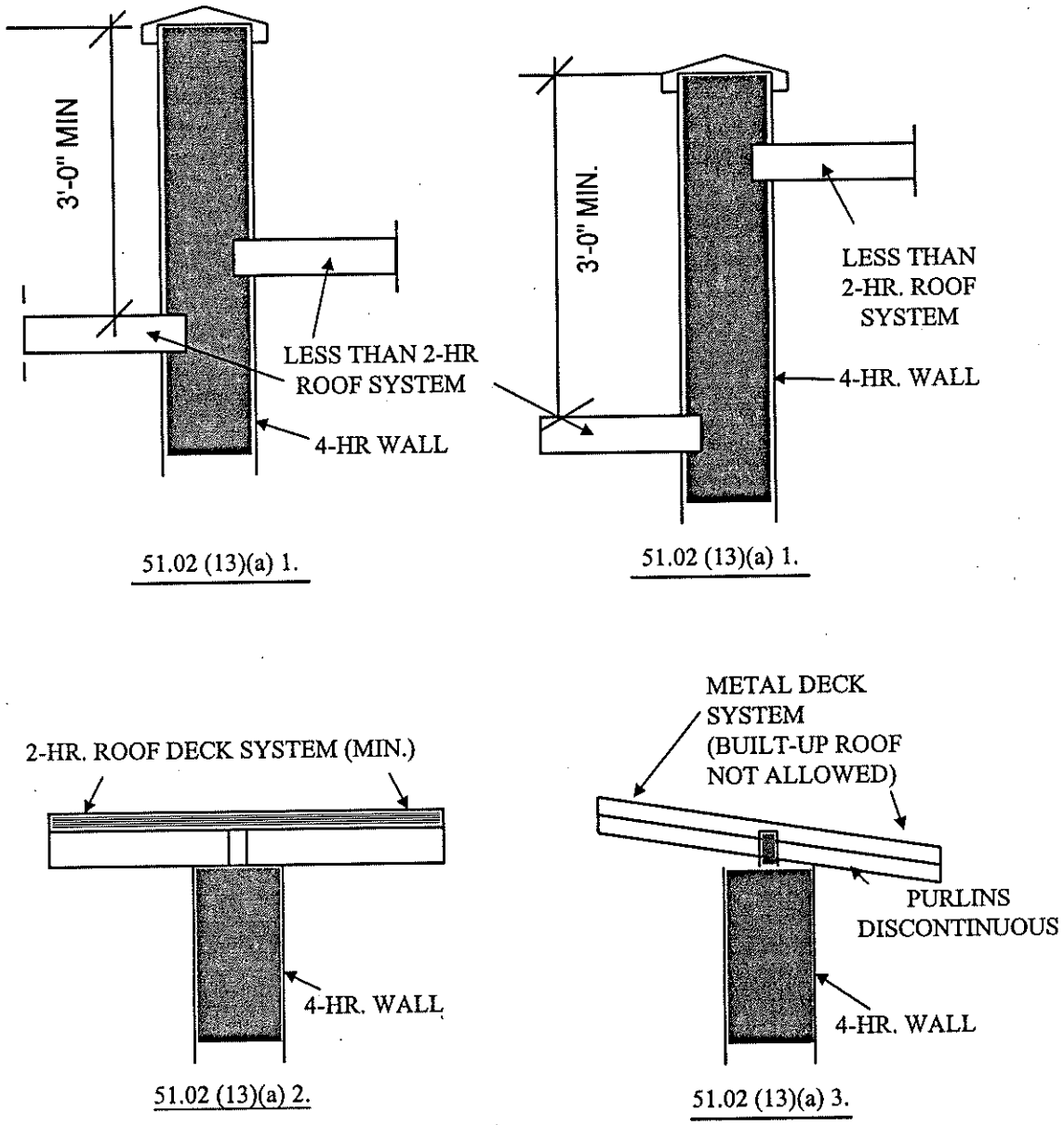


51.02 (13)(a) 3.

SECTION THRU FIRE WALL



PLAN AT FIRE WALL



FIRE DIVISION WALLS

(c) 1. All openings in fire-division walls shall be protected by fire-resistive door assemblies as specified in s. COMM 51.047.

2. The total area of all openings in any fire-division wall in any one story shall not exceed 25% of the area of the wall in that story.

Openings in fire-division walls and occupancy separation walls. These code sections limit the width of openings in a fire division or occupancy separation wall to not more than 25% of the wall area. Where two parts of a building are connected by a corridor and the corridor opening is more than 25% of the area of the common wall providing the fire separation, the department will

consider a 4-hour rated fire division wall extension. The opening need not be limited to 25% of the area of the fire wall in the connector. The wall can be extended beyond the end of the common wall either in the plane of the wall opening or constructed to provide the exterior wall of the connecting corridor.

(14) DETERMINATION OF NUMBER OF STORIES. For purposes of establishing the maximum allowable stories in the various classes of construction stated in s. COMM 51.03, the number of stories shall be determined on the following basis:

Note 1: See Appendix A for further explanatory material.

Note 2: See ch. COMM 69 for definition of "story" relative to accessibility issues.

(a) The first floor shall be determined first and this level shall satisfy the following conditions:

1. Is the lowest floor having one or more required exits for that floor and for any floor above or below; and

a. If condition stated in subd. 1. is not satisfied, the highest floor level shall be considered the first floor.

2. a. The elevation of the first floor and the sills of all required exit discharges from the first floor shall be not more than 6 feet above an exit discharge grade.

Many code requirements are based upon the number of stories in the building. Therefore, determination of number of stories should be one of the first procedures taken when designing or reviewing a building. The first story of a building must be determined first. All floor levels of the building are required to have one or more exits as prescribed by other sections of this code. All exits must eventually lead to an exterior door to the outside. Each exterior door from the building should be analyzed to determine if that exterior door serves as the outside exit for a floor level other than the floor level at the elevation of the door being analyzed.

Once it has been determined which outside doors serve as outside exits for more than one floor level, the floor level at the elevation of the lowest multiple floor exit is temporarily classified as the first story. That selected floor level must now be analyzed with respect to its elevation above grade at the exits. If it is 6 feet or less above grade at the exits, it is the first story. If it is more than 6 feet above grade at the exits, it is classified as the second story. (It is possible under this code to have a building which does not have a first story.) All floor levels below the first story will be classified as ground floors, basements or subbasements. All floor levels above the first story will be classified as stories, mezzanines or balconies. (It is conceivable that one could have a balcony or mezzanine serving a basement, ground floor or subbasement.) Floor levels constituting stories are then counted to determine the number of stories in the building.

If a building is constructed with the exit stairway enclosure placed some distance from the exterior wall (typically a multistory building utilizing a central stair/elevator core), it becomes difficult to provide a stair enclosure complying COMM 51.18 such that the stair enclosure extends from the stairway to an exterior wall. A common practice in these types of buildings is to run the stairway to a basement level, extend the stairway enclosure through the basement to the exterior wall, and then back up to the grade level and out. Although the outside exit door remains at the grade level floor elevation, which would classify the grade level floor as first story, because occupants are required to go to the basement level prior to exiting the building, the department will count the basement level as the first story.

b. Existing buildings to be licensed as child day care centers or to be converted to sheltered facilities for battered women shall comply with the requirements specified in ss. COMM 57.015 and 60.105.

(b) An interior balcony or mezzanine shall be considered as a story if:

1. The net floor area of the balcony or mezzanine exceeds one-third of the net main area enclosed within exterior walls or fire-division walls, or both; or

2. The net floor area of the balcony or mezzanine exceeds one-third of the net floor area enclosed with the walls of a single living unit or single tenant space.

Question: *Items such as free-standing mezzanines and supplemental waste oil heaters are often listed as capital equipment for accounting purposes. Are plan submittals required for these items?*

Answer: *Yes. Mezzanines affect structural strength, class of construction, fire hazard and exiting. Waste oil heaters affect fire hazard and ventilation. Thus, plans for both are required to be submitted. If the building exceeds 50,000 cubic feet in total volume, the plans must be prepared, signed and sealed by a Wisconsin registered engineer, architect or, in the case of HVAC equipment, a heating designer.*

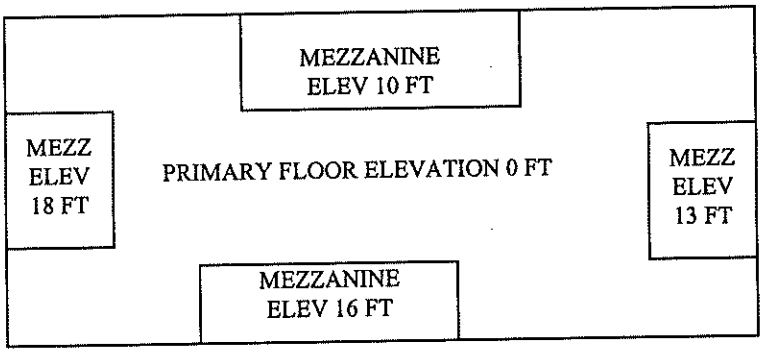
Question: *Consider a building with multiple mezzanines in various locations. If the floor elevations of the mezzanine differ by more than 3 feet, is the number of stories increased?*

Answer: *Determination of the number of stories is based on exiting in COMM 51.02 (14)(a) and on contributing fuel load in COMM 51.02 (14)(b). COMM 51.02 (11) allows an open shaft/stairway for open mezzanines but requires exit stairs for floors to be enclosed unless occupancy exception are satisfied.*

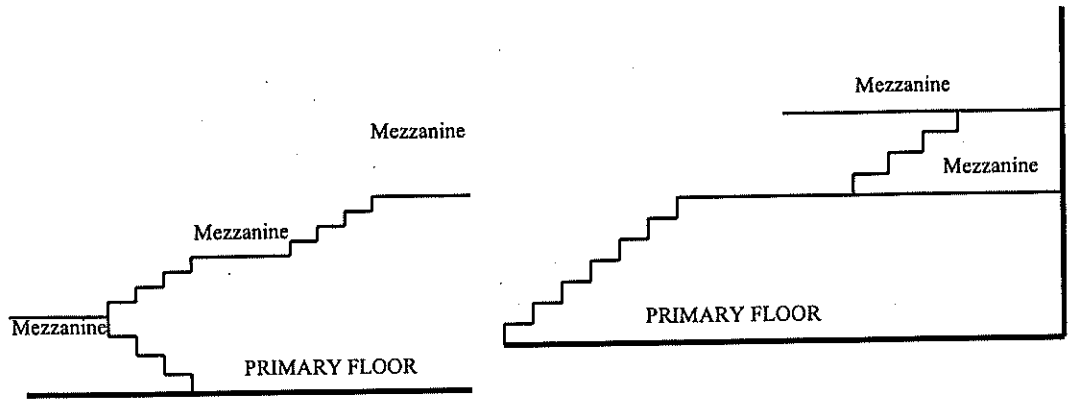
COMM 51.01 (56a) allows floor surfaces within 3 feet of each other to be considered the same floor level. Mezzanines which have greater than 3 feet between floor surfaces are considered as separate floor ***levels*** *but not necessary separate* ***floors****.*

Consider two situations:

1. Several mezzanines are scattered around the building.



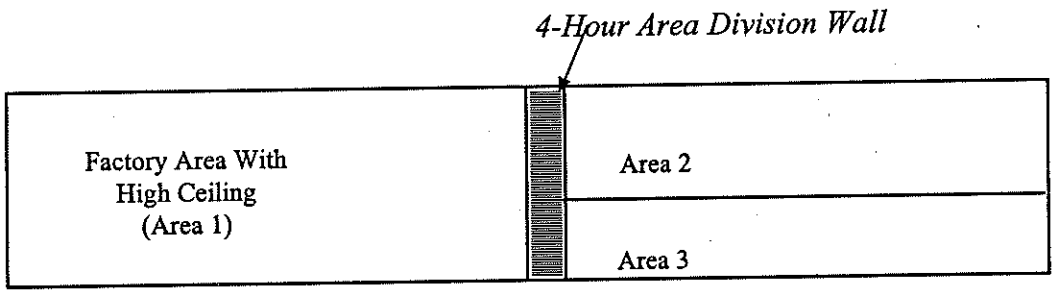
2. Mezzanines are stacked above each other.



In situations similar to the above, multiple level mezzanines may be considered within a single story providing the cumulative area of the mezzanines does not exceed one-third of the area of the primary floor.

***Question**: May areas of floor levels on different sides of a 4-hour fire wall be considered together to determine whether a floor level must satisfy mezzanine or story criteria?*

Consider the diagram below:



If area 2 is less than 1/3 the sum of area 1 plus area 3, is area 2 level a mezzanine rather than a story?

***Answer:** No. Each portion of a building created by 4-hour fire division walls must be evaluated independently except for barrier free criteria.*

The main code issues to evaluate deal with compartmentalization, barriers to exit, class of construction, and use. The 4-hour wall may serve as an occupancy separation, number of story separation, class of construction separation, and area separation.

Thus each portion of a building separated by 4-hour fire walls must be evaluated individually from other portions. The 4-hour fire wall in the above example thus creates a one story building on the left and a two story building on the right.

Note: Fire walls within a structure do not create separate buildings for application of barrier free requirements.

(c) Penthouse with a total area that exceeds 50% of the total roof area shall be counted as a story.

(d) Total number of stories shall include the first floor plus all stories above and those stories determined by pars. (b) and (c).

1. Floor levels satisfying the definition of basement, ground floor, attic, interior balcony and mezzanine floor, unless otherwise stated, shall not be counted as a story.

"STEPPED" STRUCTURES. *The code requires that the first story be determined first, and that all floor levels above the first story, except for mezzanines meeting the mezzanine definition, be counted as stories.*

A problem is encountered with buildings constructed on sloping sites where, as the construction proceeds up the slope, the floor levels are raised more than three feet, but less than a full story or floor level. Typically, the lowest floor level at grade, with exits, of the downhill portion of the structure meets the definition of first story, and is so classified. Counting all floor levels above the determined first story results in a multistory structure requiring a higher class of construction.

The first story of a building is based on exiting. If a building is constructed on a sloping site, with intermediate or "stepped" floor levels, and if exiting is provided from each section (module) independent of the exiting in the adjoining sections (modules), the department will determine the maximum number of stories based on each section (module) of the building. This will require that each section (module) have at least two exits serving only that section (module), and that stairways or ramps connecting adjoining sections (modules) may not be required exits and must qualify as convenience stairways or ramps.

The entire structure will then be classified in accordance with the section (module) having the highest number of stories.

Although, under this interpretation, each section (module) will be considered separately for determination of number of stories, it must be considered that the building, as a whole, has multiple floor levels. Therefore, floor openings consisting of the convenience stairs between sections (modules), the exit stairs within each section (module), and other floor openings must meet the requirements governing enclosure of shafts related to occupancy and connected floor levels.

(15) DECORATIVE COMBUSTIBLE MATERIALS. Any combustible materials applied to a required noncombustible exterior surface of "0" hourly rated construction or better shall not exceed the surface area percentage specified in Table 51.02, within any 100 lineal feet of a building.

TABLE 51.02

Separation of Building From Property Line or Other Buildings[1]	Maximum Surface Area Percentage[2]
Less than 10 feet	0
10 to 20 feet	10
20 to 30 feet	20
More than 30 feet	30

Footnotes to Table 51.02.

[1] The maximum surface area percentage along a street is 30, regardless of the separation.

[2] Fire-retardant treated wood may be applied to all required noncombustible exterior surfaces of "0" hourly rated construction without limit.

This code section permits combustible decorative material on the exterior surface of building walls where the code requires that the exterior walls be noncombustible. The decorative material cannot be a part of the wall. The wall consisting of the structural element (typically studs) and the interior and exterior sheathing elements must be noncombustible. The decorative material is attached to the noncombustible sheathing; it cannot serve as the sheathing.

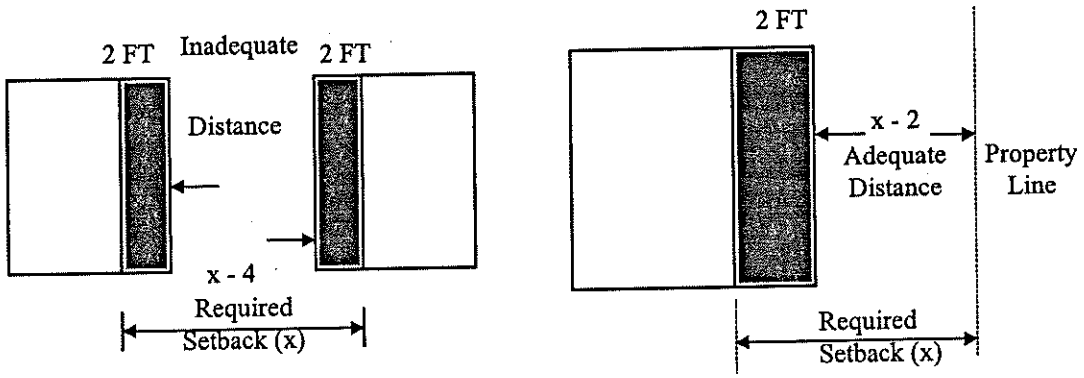
The exception to allow unlimited use of fire-retardant treated wood as decorative trim applies only to walls which do not require an hourly rating. If Table 51.03-A or any other code requirement requires that the wall carry an hourly fire rating, unlimited use of fire-retardant treated wood as a decorative trim is not permitted.

(16) PROJECTIONS INTO SETBACKS.

(a) Unenclosed terraces, slabs or stoops, without roofs or walls, may be located within required setbacks providing they are not greater than 7 inches above adjacent grade at any point and are in contact with the ground to prevent an exposed cavity which could promote fire or smoke. Grade changes from these appendages shall be of a gradual slope.

Except as permitted in the occupancy chapters, COMM 51.16 (4) does not permit a single step condition in the exit path.

(b) Open cantilevers, including but not limited to roof overhangs and eaves, may project 2 feet into the required setback from property lines. These cantilever shall not project into the required setbacks between buildings on the same property.



(c) Enclosed or partially enclosed appendages, including but not limited to decks, porches or ramps, shall not project into the required setbacks from property lines or buildings on the same property.

(18) ACCESS TO ATTIC AND ROOF.

(a) *Attic.* Every attic compartment shall be provided with access from the floor level immediately below it. The access opening shall be at least 20 by 30 inches and shall be located above the stair landing or in an accessible location.

Note: A single access point to the attic from the floor level immediately below will be acceptable if all the attic compartments are interconnected with access openings of at least 20 by 30 inches.

(b) *Roof.*

1. Except as provided in subd. 2., all buildings more than 2 stories, or 25 feet in height, where the slope of the roof is less than 3 in 12, shall be provided with a means of access to the main roof from the floor level immediately below. The roof opening shall be at least 20 by 30 inches and shall be provided with a permanent ladder or stairway.

2. Roof access shall not be required in 3 story buildings without attic space.

The department will not require roof access on buildings of 3 or less stories without attic space.

(19) ATTIC COMPARTMENTALIZATION.

(a) Except as provided in par. (b), attics of combustible construction shall be divided into areas not greater than 3,200 square feet by firestopping as specified in s. COMM 53.63 (1)(d).

1. Compartmentalization shall extend into the eave and soffit areas to provide a complete separation between compartments.

2. Panels for access openings in compartment walls shall be equipped with self-closing devices and shall normally be kept closed.

Combustible construction includes attics with wood purlins or wood roof decks. COMM 53.63 does not require an hourly rating for attic compartmentalization walls and provides several options by which compartmentalization can be obtained. Caution should be exercised, however, if the wall being used to obtain attic compartmentalization is an extension of a wall which requires a fire rating, such as an area division wall, rowhouse separation, occupancy separation, etc. In these cases, the attic compartmentalization wall must be the same rating as the wall below.

(b) Attic compartmentalization need not be provided in buildings completely protected, including the attic space, by an automatic fire sprinkler system.

(20) CLASS OF CONSTRUCTION SEPARATION.

(a) Except as provided in par. (b) and s. COMM 62.93, portions of buildings of different classes of construction, as specified in s. COMM 51.03, shall be separated by fire-division walls as specified in s. COMM 51.02 (13) or the building classification will be reduced to the lowest class of construction utilized.

In addition to class of construction separation, the department will use this code provision as a building division wall to classify a building under other critical requirements such as number of story separation, completely sprinklered/unsprinklered buildings, etc.

For areas with Chapter 57 occupancy only. *A 2-hour wall constructed as required by COMM 57.02 (2)(b) may be utilized as a class of construction separation between Types 4, 5, 7, and 8 construction.*

Question: *How are greenhouse type structures, such as sunrooms, dining room additions, etc., to be considered under the code?*

Answer: *The requirements of COMM 51.02 (20) will* ***not apply to a totally noncombustible greenhouse*** *attached to a structure of other than Type 6, as allowed by COMM 62.93 (1). The class of construction of the building will be determined without considering the greenhouse elements. The structural requirements for the greenhouse will be based on COMM 62.96 (2)(a) and COMM 62.96 (3)(a), (b), and (c). No other provisions of Subchapter IV of COMM 62 shall apply to these*

non-production greenhouses. Refer to the appropriate occupancy or general chapter for requirements. THIS DOES NOT APPLY TO BUILDINGS UNDER THE SCOPE OF COMM 58.

(b) A health care facility, parts of which are different types of construction as described in s. COMM 51.03, shall be classified as the lowest type of construction utilized, unless the different parts of the building are separated from one another by a separation wall in which case each part of the building shall be individually classified as to the appropriate type of construction. A separation wall:

1. Shall have a minimum fire-resistive rating of 2 hours;
2. Shall extend at least to the underside of the roof deck of the lowest part of the building to be separated; and
3. May not have structural members extend through or over it.

A health care facility may have other occupancies such as clinics, businesses, or ambulatory health care facilities that are contiguous to the health care occupancy. Per this section, if they have a lower class of construction, they must be separated from the health care facility with a 4-hour wall. If they are intended primarily to provide outpatient services, then per COMM 51.08 they must be separated from the health care facility with a two hour occupancy separation no matter what class of construction they are. Note that if an occupancy simultaneously serves four or more litter-borne patients, then it is subject to the licensing and building code requirements for health care facilities. Because of the definition of a health care facility, the 2 hour class of construction separation allowed in (b) is limited to those between two hospitals, two nursing homes or a hospital and a nursing home.

(21) HEIGHT LIMITATIONS.

(a) Except as provided in par. (b), the height of buildings shall be limited as specified in the appropriate occupancy chapter for the building and as specified in s. COMM 51.03 and Table 51.03-A for the class of construction utilized.

(b) The height limitations specified in s. COMM 51.03 may be increased by one story and 10 feet in height in buildings, other than buildings within the scope of chs. COMM 58, 60 and 61, when the building is completely protected by an automatic fire sprinkler system and the system is supervised and monitored as specified in s. COMM 51.23 (9).

This section permits an increase in building height and number of stories over the basic height and story limitations if a sprinkler system is provided. These increases in stories and height are tabulated in Table 51.03-C. Please note that if an increase in number of stories or height is desired and utilized, the sprinkler system must be supervised and monitored in accordance with COMM 51.23 (9) which requires monitoring by a central station, remote, auxiliary or proprietary fire alarm system company.

Note: See chs. COMM 54 to 61 for specific application of height increases. Tables 54.01-2, 57.02-3 and 59.12-2 already include the one story height increase.

(22) FIRE-RESISTIVE RATINGS.

(a) Except as provided in par. (b), the fire-resistive ratings specified in chs. COMM 50 to 64 may be reduced in rating by one hour to a minimum of one hour in all buildings which are completely protected by an automatic fire sprinkler system and the system is supervised and monitored as specified in s. COMM 51.23 (9).

If a building is completely protected by an automatic sprinkler system and sprinkler credit is not being taken to increase area or occupant capacity, fire-resistive ratings required by code may be reduced by one hour. The ratings, however, may ***not be reduced*** *to a level* ***below one hour****. This allowance for reduction of fire-resistive ratings does not apply if the sprinkler system is provided as required by COMM 52.01.*

(b) The fire-resistive rating may not be reduced for the following:

1. The fire-resistive ratings specified in ch. COMM 58;
2. The fire-resistive ratings specified for stairway enclosures in buildings more than 3 stories in height;
3. The fire-resistive ratings for buildings more than 60 feet in height; and
4. The fire-resistive ratings for buildings where increases in building area or building height due to automatic fire sprinkler system protection have been utilized.

Fire-resistive ratings may not be reduced in any institutional occupancies under the scope of Chapter COMM 58. The ratings required for stairway enclosures may not be reduced if the building has more than three stories.

In order to use this provision, the entire building must be protected by a sprinkler system unless the unsprinklered portions of the building are separated by a 4-hour fire-division wall in accordance with COMM 51.02 (13).

If the reduction in fire-resistive ratings is taken, the sprinkler system must be supervised and monitored in accordance with COMM 51.23 (9) which requires monitoring by a central station, remote, auxiliary or proprietary fire alarm system company.

(23) WOOD BLOCKING IN NONCOMBUSTIBLE RATED ASSEMBLIES AND ROOF ASSEMBLIES. Combustible wood blocking may be installed:

(a) At the intersection of roofs with exterior walls or parapet walls to fasten roof edging, roof membranes, facias and roofing expansion joints; and

Question: *Can I utilize plywood or other combustible nailing sheets or strips on a required noncombustible fire-rated roof or roof assembly for the purpose of attaching roof coverings such as shingles?*

Answer: *The roof is required by code to be both noncombustible and fire rated. This would imply that use of combustible sheeting or strips would violate the noncombustible requirement. Roof coverings, however, are combustible (shingles, multi-ply build-ups, membranes, etc.). Therefore, the intent is obviously not to completely exclude combustible elements from the total roof construction. If the roof framing and deck provide the fire rating required, and are noncombustible, combustible nailing sheets and strips may be installed* ***ABOVE*** *the noncombustible rated framing* ***and deck****. This will normally be limited to decks of precast or poured-in-place concrete since rated noncombustible roof assemblies consisting of metal deck or steel framing include everything in the listed assembly between the top surface of the roof covering and the bottom surface of the ceiling. In these instances, the combustible nailer may not be used unless included* ***as a part of the tested and listed assembly****. Also, if a tested and listed assembly is used which incorporates a combustible nailer, the nailer cannot serve as the structural roof deck since this would violate the noncombustible requirement for the roof indicated in the question.*

(b) In noncombustible rated wall assemblies to fasten window frames, door frames, sinks, toilets and urinals, toilet partitions, grab bars, book shelves, and other similar components. In these applications, the amount of wood blocking shall not exceed that required to secure or fasten the item to the assembly.

COMM 51.03 CLASSES OF CONSTRUCTION STANDARDS.

The requirements for the nine construction classifications utilized by this code are described in this section. The class of construction descriptions are augmented by Table 51.03-A. Users of this code are cautioned to utilize both the written requirements for a particular classification and Table 51.03-A, rather than utilizing only one of these provisions.

Table 51.03-A sets forth construction requirements for various building elements. It does not necessarily dictate where those elements are required. For instance, line 20 sets forth construction requirements for stairways and vertical shafts. Line 20 should only be applied to a building where an occupancy or general requirement of the code mandates enclosure of stairways and shafts.

Fireproofing composed of combustible or organic materials applied in accordance with a tested, listed, fire-resistive assembly will be permitted without affecting the noncombustibility of the element fireproofed.

Nonstructural foam plastic may be installed on or in a building element without affecting the noncombustible classification provided the installation of the foam plastic meets all applicable requirements of COMM 51.06.

Skylights *Table 51.03-A, Lines 5 through 9 require, for various classes of construction, that roof framing and decks carry an hourly rating. Skylights are typically light framed, prefabricated steel with glass panels. The framing does not lend itself to fireproofing, and the glass "deck" does not have an hourly rating. Therefore, strict application of the code would prohibit skylights in buildings requiring hourly ratings for the roof framing and deck.*

The department will accept unprotected skylight framing and decks. This will typically be the mullions supporting the glass, the trusses, and beams or channels supporting the mullions. Structural members at the perimeter of the skylight, providing support to the skylight framing, are not considered part of the skylight framing.

All building framing members which support the skylight framing must be fireproofed in accordance with applicable code requirements.

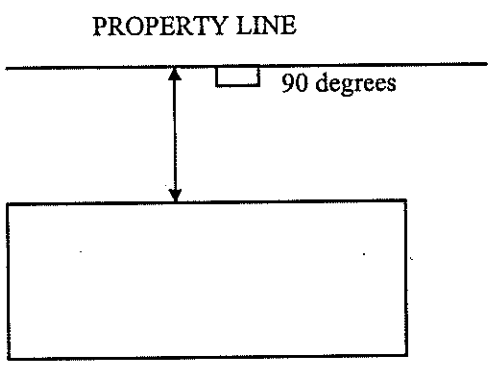
The combustible or noncombustible requirements must be met. Also, all light-transmitting plastics requirements shall be satisfied.

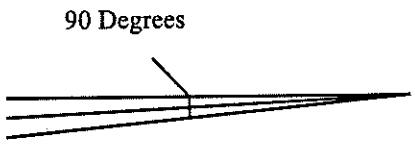
Question: *Tables 51.03 A and B contain requirements for wall fire rating and opening percentage if the wall is located a set distance from a property line or another building. How is this distance measured?*

Answer: *Distances referred to in Tables 51.03 A and B shall be measured perpendicular to the bisector of the angle formed by the intersection or projected intersection of the building face with property lines, other buildings, or fire walls. See diagrams below for typical examples.*

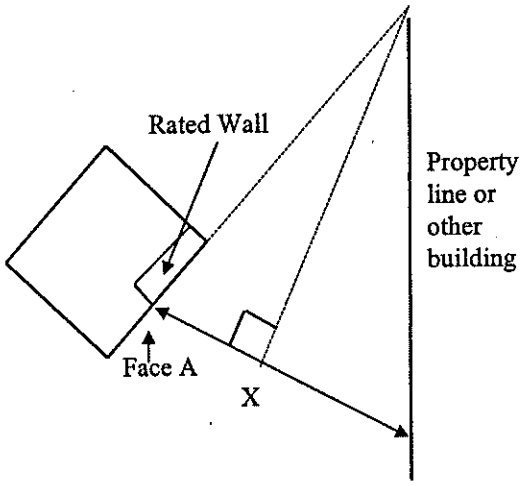
Where public alleys which are less than 30 feet wide are adjacent to the property line, the distance for Tables 51.03-A and B purposes may be measured to the far side of the alley.

Measuring Distances to Property Lines & Other Buildings

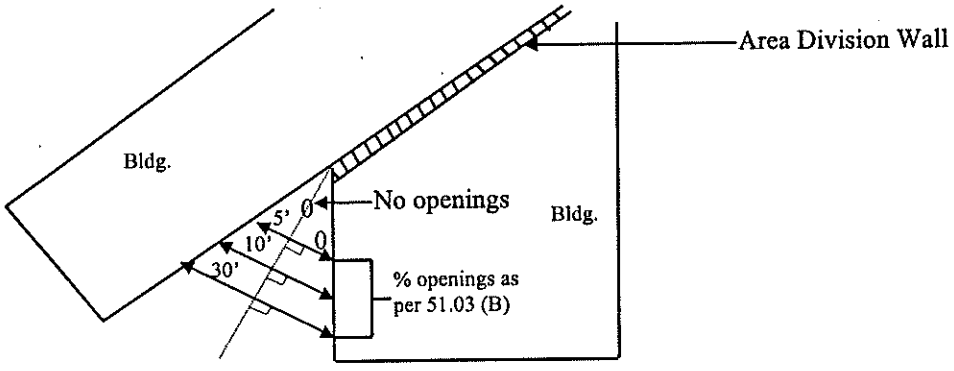




The intersection of two lines which are slightly out of parallel is a very small angle. Thus the perpendicular bisector of the angle is basically perpendicular to the original lines.



To determine the portion of a wall (A) that is within a distance X setback from a property line or another building, extend the wall face to its intersection with the property line or other building. Bisect the angle formed by the intersection. Measure X perpendicular to the bisector.

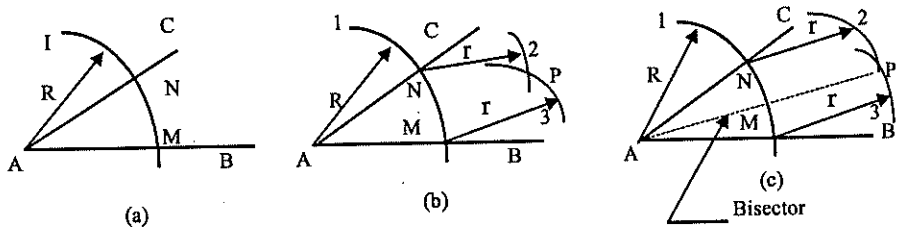


To bisect an angle:

1. Choose any radius (R). With the center at A, draw an arc (1) intersecting line AB and AC.

2. Select a radius (r) greater than one-half the distance between points M and N. With the center at N, draw arc (2). With the center at M, draw arc 3 to its intersection with arc 2 at point P.

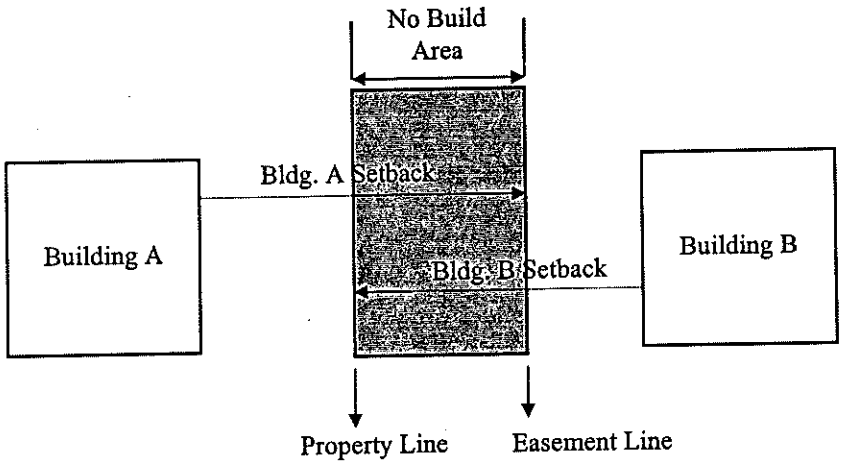
3. A line from point A to point P bisects angle CAB. (See figure below.)



Question: *When an easement for land on adjoining property is utilized to satisfy setback requirements for a building as allowed in COMM 51.01 (104)(b), must the building on the adjoining property utilize the property line or the easement line for its setback requirements?*

Answer: *The area between the property line and the easement line is a no-build-area for both owners. Historically the department has allowed setbacks to be measured to the far side of alleys for properties on both sides of an alley. The intent of the code is to maintain open area to prevent the spread of fire and to facilitate fire fighting. The required open area is maintained even if both utilize the easement area as part of their setback.*

No building may be constructed in the no-build area between the property line and the easement line. Both adjoining property owners may utilize the easement area to satisfy setback requirements as shown below. The building may thus utilize the property line for setback measurement.



Question: *What is the intent of Table 51.03-A, Footnote k.*

Answer: *Footnote k clarifies that an exterior wall assembly requiring a fire-resistance rating may consist of an assembly which has been tested, rated, and listed based on a fire exposure on one side, the inside.*

Research of reference material leads to the conclusion that building codes have historically regulated exterior wall construction on the basis of containing internal fires within the building. Insufficient fire data and fire testing is available on the impacts of spread of fire through external routes, but some current code rules address the issue of spread of fire through external exposure (i.e., allowable wall openings, decorative combustible materials on exterior surfaces, building locations and parapet walls).

The current nationally recognized fire testing standard, ASTM E119, evaluates the heat transmission performance of an assembly of materials under controlled laboratory conditions which do not include test procedures which would simulate an exterior fire exposure to the test assembly.

Footnote k may not be interpreted to permit the substitution, deletion or addition of construction materials in fire tested, rated and listed assemblies. Finish ratings of a tested, rated and listed assembly may be used only in combustible construction to provide the fire-resistive rating required by Table 51.03-A. For instance, if Footnote k applies to a wood stud wall, the wall may be a full assembly such as one layer of dry wall on each side of the studs or a finish rating such as two layers of dry wall on the inside of the studs.

Question: *The new revisions to Table 51.03-A deleted the reference to Footnote k for exterior walls located closer than 30 feet to another building or property line. Does this change where finish ratings only may be used rather than a complete fire-resistive assembly?*

Answer: *Yes. The intent of the code is to provide a fire barrier on the inside of an exterior wall to contain the fire within the building and also to provide an exterior fire barrier to prevent conflagration of fire between buildings in close proximity to each other.*

If Footnote k applies*: Any wall with the specified rating or an interior finish with the specified rating may be used. The assembly may be tested from the inside only.*

If Footnote k does not apply*: Use of the finish rating or assemblies tested from one side only is not permitted. Symmetrical systems may be utilized. Systems which specify "FIRE SIDE ONLY," similar to UL-U325, cannot be utilized.*

Question*: Is the sheathing of a wall system part of the wall requiring compliance with Table 51.03-A or is it interior finish which may comply only with COMM 51.07 or exterior decorative material which may comply only with COMM 51.02 (15)?*

Answer: *A wall elements consist of the interior sheathing, the exterior sheathing, the framing, and anything installed between the external-internal sheathing when provided. The wall elements, if provided, shall satisfy the COMM 51.03 Class of Construction requirements. Combustible wood blocking may be installed in noncombustible wall assemblies to fasten window and door frames, sinks, toilets, partitions, grab bars and similar components providing the amount of blocking does not exceed that required to fasten the items to the assembly. Interior finish complying with COMM 51.07 may be applied* ***on*** *the interior wall sheathing. Decorative combustible materials complying with COMM 51.02 (15) may be applied* ***on*** *the external sheathing.*

Question: *May high density, solid plastic water closet or urinal enclosures/screens be considered fixtures as opposed to partitions which require compliance with COMM Table 51.03-A, line 18, and COMM 51.0, interior finish requirements?*

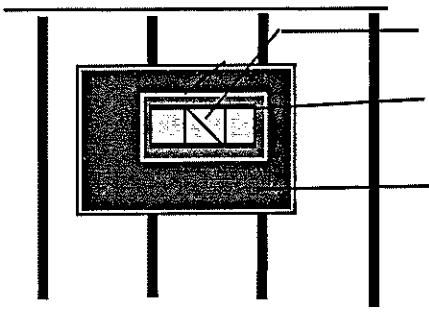
Answer: *Yes, solid plastic which has a density of 20 pounds per cubic foot or greater used to enclose or screen water closets or urinals to a height of 5 1/2 feet above the floor as required by COMM 52.59 (2) will be considered as fixtures or furnishings. Toilet room partitions which*

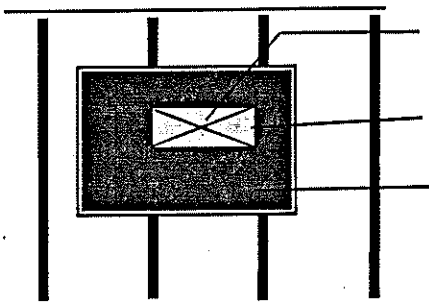
provide enclosure/screening greater than 5 1/2 feet will be considered as interior surfaces of a building and shall satisfy COMM Table 51.03-A and 51.07 requirements.

Question: *May solid blocking between stud spaces be utilized in lieu of providing fire stopping at wall membranes where walls are required to be 1-hour rated per Table 51.03-A, lines 11 through 18?*

Analysis: *The intent of Table 51.03-A lines 11 through 18 requirements is to provide fire-resistive protection for the specified structural elements. It is not to prevent the passage of smoke or fire between rooms (see 51.02 (5) note). Interior doorway openings, passageway openings without doors, service windows, etc., do not require protection of openings. Typically, the 2x members and decorative trim framing the openings are considered adequate to protect the structure. A pipe or duct in one of these openings would need no other fire-rated protection. Similarly, a framed opening within the wall provides structural protection.*

Answer: *Yes, solid blocking between stud spaces as shown below is satisfactory to meet COMM 51.049 application to Table 51.03-A lines 11 through 18 requirements. Where the walls are* ***only*** *required to be fire-rated by these sections, protection of wall penetrations where piping, ductwork, wires, etc., penetrate the wall membrane is not required in openings firestopped with 2x members for the full depth of the stud space. This application is limited in scope and does not apply to the fire-rated walls required for other purposes such as isolation, separation, or exit enclosure purposes.*





NOTE: WHEN THE "OPENING" IS INFILLED WITH DRYWALL, THE BLOCKING SHOULD BE LOCATED TO PROVIDE THE LEAST AREA BETWEEN THE BLOCKING AS POSSIBLE.

Question: *COMM 51.01 (115) specifies the method for measuring the distance between a building and property line or the distance between two buildings for exterior wall fire-resistive rating (Table 51.03-A) and percent openable (Table 51.03-B) purposes. Is this method also applicable for wall protection adjacent to area division walls within a building?*

Analysis: *The intent of an area division wall is to prevent the spread of fire from one side of the wall to the other for a specified time period. Exterior walls and openings in close proximity to the adjacent building section may allow the fire to circumvent the fire wall by heat radiation, flame impingement, or small flying brands if these exterior walls are left unprotected. For the purpose of firefighting, building sections divided by area division walls are considered as separate buildings; therefore, it is appropriate to apply COMM 51.01 (115) and Tables 51.03-A and B criteria to walls adjacent to area division walls. Do not apply this criteria to occupancy separations, isolations or enclosures.*

Answer: *Yes. Tables 51.03-A and B wall rating an percent opening restrictions apply to portions of buildings divided by area division walls.*

In buildings with area division walls, the ***exterior walls adjacent to the fire wall*** *shall be protected as specified in Tables 51.03-A and B. The rating of the exterior walls shall be as indicated in Table 51.03-A, but need not be greater than the rating of the area division itself.*

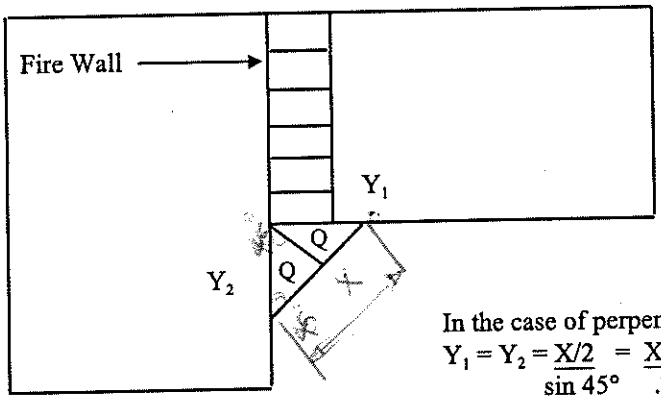
See typical examples below.

X = Distances specified in Tables 51.03-A and B to other buildings or property lines

Y = Corresponding distances from the fire wall along the building exterior face where protection is required

Q = X/2

A. 90° INTERSECTION

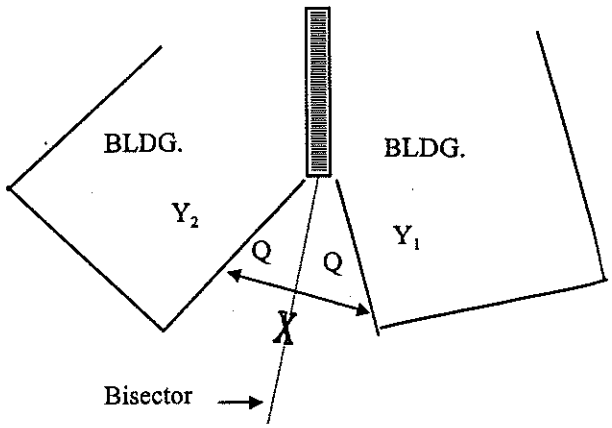


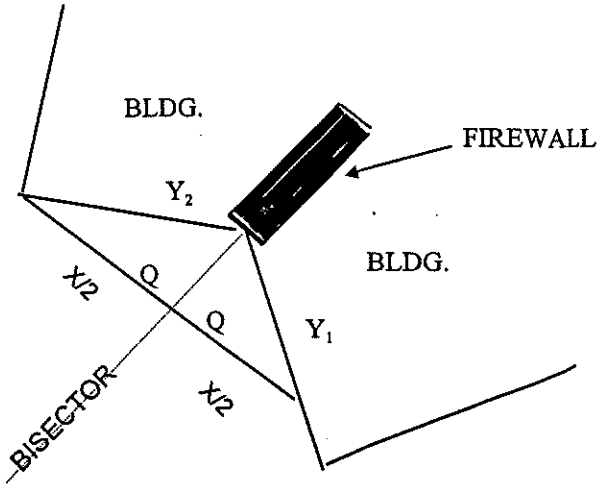
In the case of perpendicular walls

$$Y_1 = Y_2 = \frac{X/2}{\sin 45°} = \frac{X/2}{.707}$$

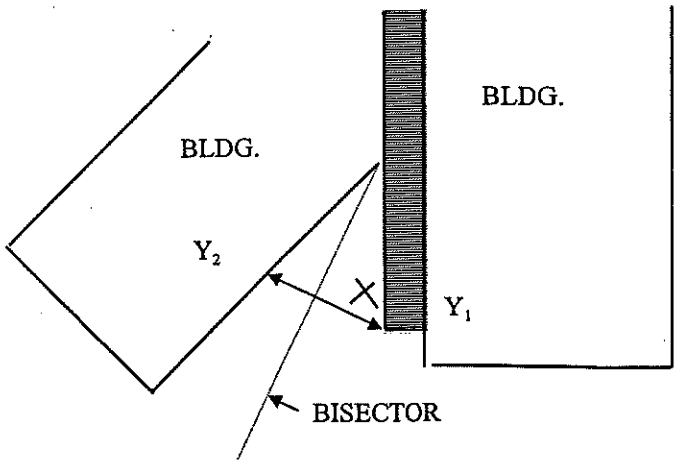
X = 5 feet	Y = 3.5
X = 10 feet	Y = 7.0
X = 30 feet	Y = 21.0 feet

B. INTERSECTION IS LESS THAN 180°





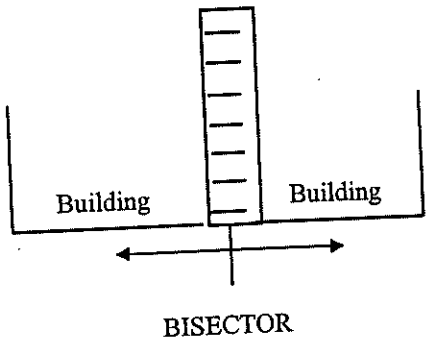
$$Y_1 = Y_2 = \frac{x/2}{\sin Q}$$



In the above cases, if the rated fire wall is extended along one exterior wall for a distance Y, no protection is required for the corresponding wall portion for a distance Y on the other side of the fire wall.

Note: Due to the area division wall requirements and the protection of adjacent walls, parapets ar not needed on the walls adjacent to the area division walls if not required for other purposes.

*C. **Intersections ≥ 180°** - No protection is required*



Measurement perpendicular to the angle bisector does not intersect the exterior wall; therefore, method does not work. Protection is not required.

TABLE 51.03-A
CLASSES OF CONSTRUCTION FIRE-RESISTIVE RATINGS IN HOURS

		MODIFYING CONDITIONS		TYPES OF CONSTRUCTION									
	Building Element	m Number of Stories	See Notes f g n Bldg Setback Dist. to P/L or to Other Bldg. on Same Prop.	Fire Resistive Type A No. 1	Fire Resistive Type B No. 2	Metal Frame Protected No. 3	Heavy Timber No. 4	Exterior Masonry, Protected No. 5A	Exterior Masonry, Unprotected No. 5B	Metal Frame Unprotected No. 6	Wood Frame Protected No. 7	Wood Frame Unprotected No. 8	Applicable Notes See S. COMM 51.03 for Construction Standards
01.	Interior Supports (columns, piers, frame legs, posts)	Over 8 stories or more than 85 ft. in height		NC-4	NC-3	NP	NP	NP	NP	NP	NP	NP	a d
02.		8 stories or 85 ft. in height or less		NC-3	NC-2	See s. COMM 51.03 (3) NC-1	See s. COMM 51.03 (4) H.T. or NC-1	See s. COMM 51.03 (5) 1	See s. COMM 51.03 (5) 0	See s. COMM 51.03 (6) NC-0	See s. COMM 51.03 (7) 1	See s. COMM 51.03 (8) 0	a d
03.	Floor Framing (beams, girders, joists, slabs, deck)	More than 2 stories		NC-3	NC-2	See s. COMM 51.03 (3) NC-1	See s. COMM 51.03 (4) H.T. or NC-1	See s. COMM 51.03 (5) 1	See s. COMM 51.03 (5) 0	See s. COMM 51.03 (6) NC-0	1	0	a
04.		2 stories or less		NC-2	NC-1	NC-1	See s. COMM 51.03 (4) H.T. or NC-1 1 story H.T. or 0	1	0	See s. COMM 51.03 (6) NC-0 or 1	1	0	a
05.	Roof Framing (trusses, beams, girders, joists, frame rafters, purlins, deck)	Over 8 stories or more than 85 ft. in height		NC-2	NC-1-1/2	NP	NP	NP	NP	NP	NP	NP	a
06.		3 to 8 stories or 85 ft. in height or less		NC-2	NC-1-1/2	NC-1	See s. COMM 51.03 (4) H.T. or NC-1	1	0	NC-0	1	0	a
07.		2 stories or under 25 ft. in height		NC-1	NC-1	NC-1	See s. COMM 51.03 (4) H.T. or NC-1	See s. COMM 51.03 (5) 1	See s. COMM 51.03 (5) 0	NC-0	See s. COMM 51.03 (7) 1	0	a
08.		1 story - roof framing more than 20 ft. above fl.		NC-0	See s. COMM 51.03 (2) NC-0	NC-0	See s. COMM 51.03 (4) H.T. or NC-1	0	0	0	0	0	a
09.		1 story - roof framing 20 ft. or less above fl.		NC-1	NC-1	NC-1	See s. COMM 51.03 (4) H.T. or NC-1	1	0	0	See s. COMM 51.03 (7) 1	0	a
10.	Roof Covering			Class A	Class A	Class A	Class B	Class B	Class B	Class C	Class C	Class C	a

KEY TO ABBREVIATIONS

NC - Noncombustible
NP - Not Permitted
H.T. - Heavy Timber
P/L - Property Line

KEY EXAMPLE TO READING CHART

0 = 0, No Hour Rating
1 = Combustible or Noncombustible 1-Hour Rating
NC-0 = Noncombustible 0-Hour Rating

a - See occupancy sections of the code for other basic requirements and more restrictive limitations.
b - Roof covering same as for main building.
c - Walls of solid wood 4 inches in thickness are acceptable as equal to 1-hour fire-resistive rating.
d - Fire-resistive requirements also apply for those bracing members required for gravity loading.
e - Refer to Table 51.03-B for allowable areas for windows and other openings in exterior walls.
f - For exceptions, refer to s. COMM 51.02.
g - Setbacks and distances to P/L or other buildings on same property do not apply to P/L along streets.
h - Approved fire-retardant treated wood will be accepted in lieu of 3/4-hour fire-resistive ratings.
j - For openings in partitions and interior bearing walls, see s. COMM 51.02.
k - Hourly ratings specified as for fire exposure from the inside of the building only.
m - See Table 51.03-C concerning height limitations.
n - Setbacks shall be measured as specified in s. COMM 51.01 (115).
p - The elevator machine rooms shall have the same fire-resistive rating specified in line 20 for fire enclosures. Where the elevator machine room is the only room located above the roofline of a building, the fire-resistive rating for fire enclosures is not required.

TABLE 51.03-A Continued
CLASSES OF CONSTRUCTION FIRE-RESISTIVE RATINGS IN HOURS

		MODIFYING CONDITIONS		TYPES OF CONSTRUCTION									
	Building Element	m Number of Stories	See Notes f g n Bldg Setback Dist. to P/L or to Other Bldg. on Same Prop.	Fire Resistive Type A No. 1	Fire Resistive Type B No. 2	Metal Frame Protected No. 3	Heavy Timber No. 4	Exterior Masonry, Protected No. 5A	Exterior Masonry, Unprotected No. 5B	Metal Frame Unprotected No. 6	Wood Frame Protected No. 7	Wood Frame Unprotected No. 8	Applicable Notes See S. COMM 51.03 for Construction Standards
11.	Exterior Walls & Court Walls Includes columns in the plane of the wall and outward therefrom. Does not include interior furring attached to inside surface of wall. (See Table 51.03-B concerning openings)		Bearing - Less than 10 ft.	NC-4	NC-3	NC-2	NC-2	2	2	NC-2	See s. COMM 51.03 (7)(a) 4	See s. COMM 51.03 (8)(d) 4	a d e f
12.			Bearing - 10 ft. to 30 ft. inclusive	NC-3	NC-2	NC-3/4	1	2	1	NC-0	1	0	a c d e f
13.			Bearing - Over 30 ft.	NC-2	NC-1	NC-0	1	2	1	NC-0	1	0	a c d e f k
14.			Nonbearing - Less than 10 ft.	NC-2	NC-2	NC-1	NC-1	2	1	NC-1	See s. COMM 51.03 (7)(e) 4	See s. COMM 51.03 (8)(d) 4	a d e f
15.			Nonbearing - 10 ft. to 30 ft. inclusive	NC-1	NC-1	NC-0	1	2	1	NC-0	1	0	a c d e f
16.			Nonbearing - Over 30 ft.	NC-0	NC-0	NC-0	3/4	1	0	NC-0	1	0	a c d e f h k
17.	Interior Walls Bearing			NC-3	NC-2	NC-1	1	1	1	NC-0	1	0	a j
18.	Partitions			NC-0	NC-0	NC-0	0	0	0	0	0	0	a j
19.	Required Exit Corridor Enclosure.			NC-2	NC-2	NC-1	1	1	1	1	1	1	a
20.	Fire Enclosure (stairways, elevators vertical shafts) p	Over 3 stories		NC-2	NC-2	NC-2	2	2	1	1	1	1	a f
		3 stories or less		NC-2	NC-2	NC-1	1	1	1	1	1	1	a f
21.	Penthouse Walls			NC-0	NC-0	NC-0	0	NC-0 or 3/4	NC-0 or 3/4	0	0	0	a h
22.	Penthouse Roof			NC-0	NC-0	NC-0	0	0	0	0	0	0	a b

KEY TO ABBREVIATIONS

NC - Noncombustible
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0 = 0, No Hour Rating
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a - See occupancy sections of the code for other basic requirements and more restrictive limitations.
b - Roof covering same as for main building.
c - Walls of solid wood 4 inches in thickness are acceptable as equal to 1-hour fire-resistive rating.
d - Fire-resistive requirements also apply for those bracing members required for gravity loading.
e - Refer to Table 51.03-B for allowable areas for windows and other openings in exterior walls.
f - For exceptions, refer to s. COMM 51.02.
g - Setbacks and distances to P/L or other buildings on same property do not apply to P/L along streets.
h - Approved fire-retardant treated wood will be accepted in lieu of 3/4-hour fire-resistive ratings.
j - For openings in partitions and interior bearing walls, see s. COMM 51.02.
k - Hourly ratings specified as for fire exposure from the inside of the building only.
m - See Table 51.03-C concerning height limitations.
n - Setbacks shall be measured as specified in s. COMM 51.01 (115).
p - The elevator machine rooms shall have the same fire-resistive rating specified in line 20 for fire enclosures. Where the elevator machine room is the only room located above the roofline of a building, the fire-resistive rating for fire enclosures is not required.

TABLE 51.03-B
MAXIMUM TOTAL ALLOWABLE AREA OF WINDOWS OR OTHER WALL OPENINGS IN PERCENT OF TOTAL EXPOSED EXTERIOR WALL SURFACE

Setback From Property Line, or Other Walls on Same Property[1,4]	Class of Construction 1. Fire-Resistive "A" 2. Fire-Resistive "B" 3. Metal Frame Protected 4. Heavy Timber 5. Exterior Masonry		6. Metal Frame Unprotected	7. Wood Frame Protected	8. Wood Frame Unprotected
	Bearing Wall	Nonbearing Wall			
Less than 5 feet	No Openings	No Openings	No Openings	Not Permitted	Not Permitted
5 feet to less than 10 feet	20%[2] Fire Window Required[3]	30%[2] Fire Window Required[3]	30%[1,2]	Not Permitted	Not Permitted
10 feet to less than 30 feet	30%[1]	40%[2]	40%[2]	40%[2]	40%[2]
30 feet or over	No Limit	No Limit	No Limit	No Limit	No Limit

[1] Does not apply to property lines along streets.

To utilize this exception, the street must comply with the definition in COMM 51.01 (124). The exception does not apply to public thoroughfares less than 30 feet wide. However, the distance to the property line will be considered as being measured to the far side of the thoroughfare.

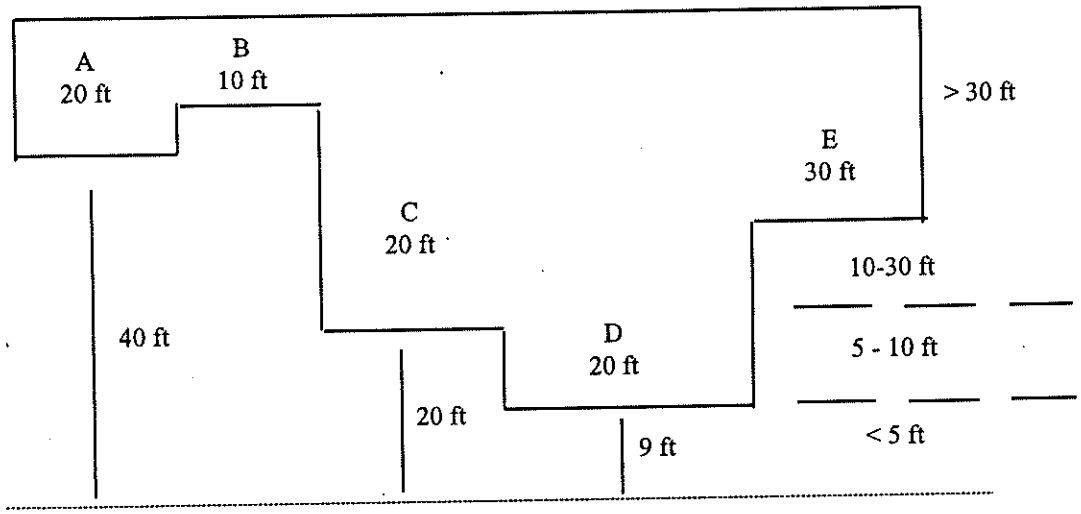
[2] Tabulated percentage of openings shall be applied to each 100 lineal feet of wall. This tabulation will not allow wing walls or high parapets, etc., to be used to increase exposed wall areas and thereby increase allowable total area of openings. Where openings are permitted, such openings protected with approved automatic-closing, 3-hour fire door or shutter assemblies--No Limit.

[3] Fire windows shall be as required for moderate fire exposure--see COMM 51.048.

Note: The window area may also be restricted by other code requirements such as thermal performance requirements specified in ch. COMM 63.

[4] Setbacks shall be measured as specified in s. COMM 51.01 (115).

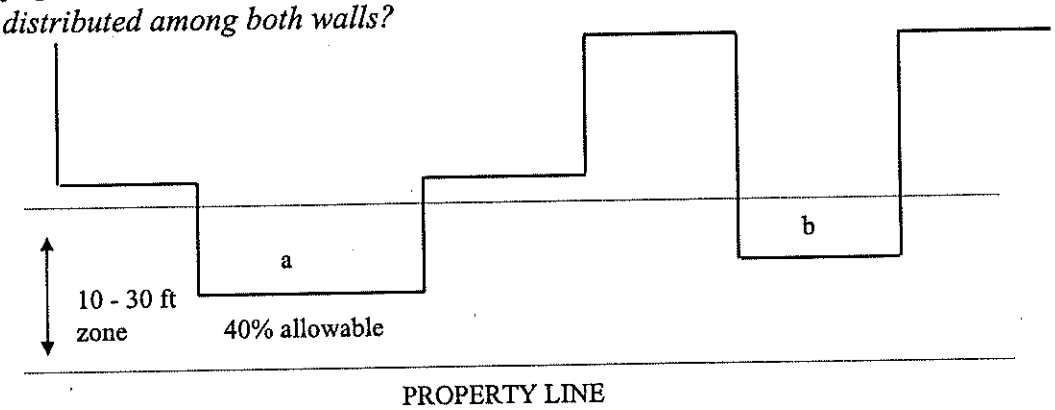
Question: *How is the percentage of openings calculated for buildings with walls located in several "zones" of Table 51.03-B such as the example below?*



Analysis: *The intent of the code is to minimize the effects of radiation, flame propagation, and flying brands by limiting the amount of openings when near another building or a property line. The intent of specifying that the percent of openings is calculated per 100 linear feet of wall is to prevent the accumulation of allowable openings in a long wall from being concentrated in one area (i.e., concentrating all the openings allowed in a 1,000-foot long wall in a 50-foot long wall segment would not satisfy the code intent).*

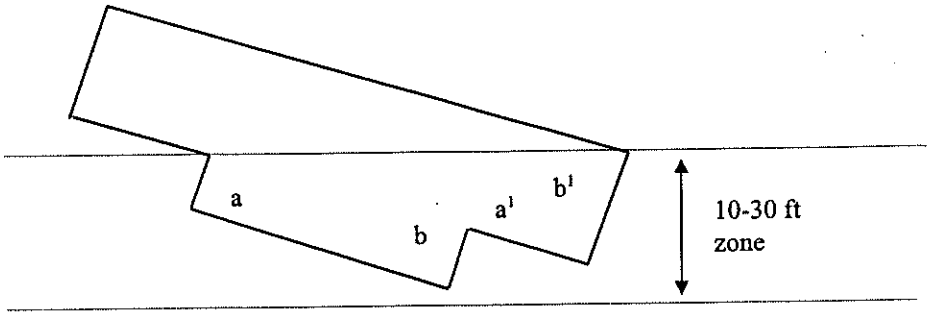
Two additional questions to consider are:

1. Where walls such as those shown below are within the same Table 51.03-B zone, may the full percentage of openings be provided in "a" with "b" having no openings or must the allowable openings be distributed among both walls?



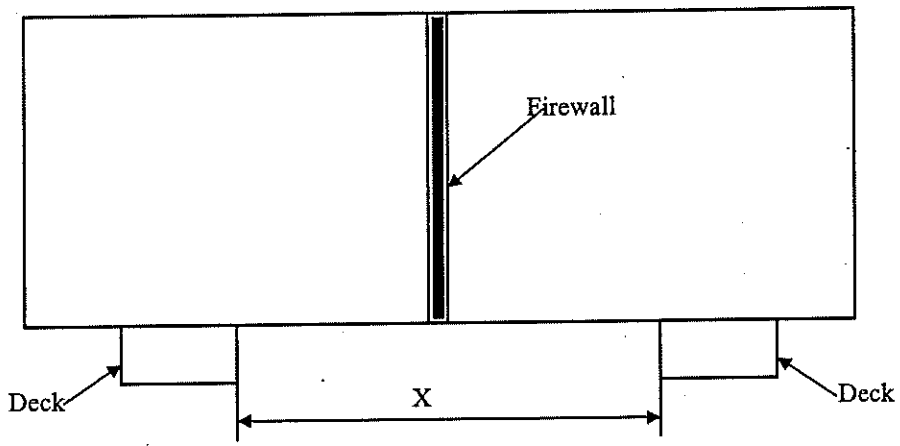
The code intent is to distribute the percentage of openings so that no single wall segment poses an exceptionally higher chance of allowing fire to spread between buildings.

2. What happens when the wall is at an angle to the property line?



Walls which are in proximity to a source of fire will have a chance of being affected by radiation, flame propagation, and flying brands, thus should be considered in calculating the percent openable. The concept that when a wall changes direction, it is a different wall that may be used.

Question: *What separation is required between decks located adjacent to fire walls?*



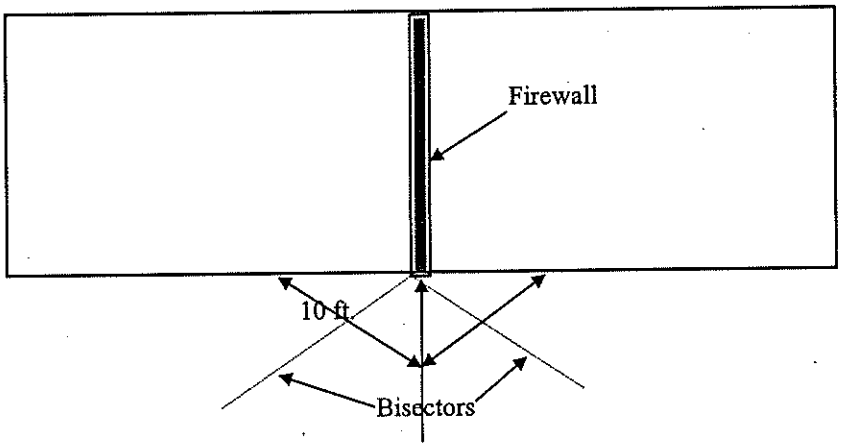
Analysis: *Several code issues must be evaluated for compliance in this situation. Patio or other door locations would be governed by COMM Table 51.03-B, the distance between parts of the building separated by fire walls is governed by Tables 51.03-A and B, and the separation of the decks are also affected by Table 51.03-B percent opening requirements.*

Answer: *Using COMM Table 51.03-A and B rationale:*

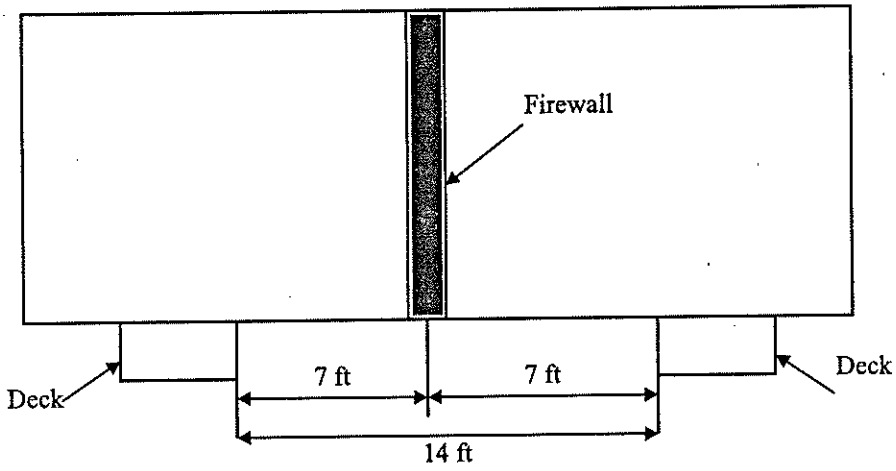
1. Project an extension of the fire wall;

2. Bisect the angle formed by the fire wall extension and the exterior wall;

3. Find the point where the perpendicular to the bisector is 10 feet. No encroachment may be in this area.

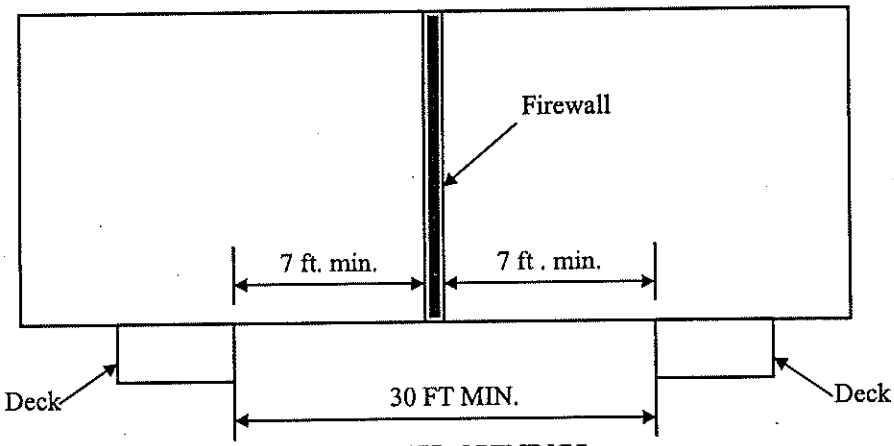


FIREWALL
EXTENSION



CANTILEVERED DECKS

If the deck has supporting post, the percent openings applies



UNLIMITED OPENINGS
COLUMN SUPPORTED DECKS

Question: *How does the percentage of allowable openings in Table 51.03-B apply to canopies?*

Answer: COMM Table 51.03-B applies to canopies. *Thus, no openings are permitted in a canopy "wall" within 5 feet of a property line or other building. The location of the canopy "wall" will be determined by projecting imaginary vertical planes at the outer surface of the exterior supports or columns. For cantilevered structures with interior supports, the imaginary vertical planes will be projected at the farthest roof projection or overhang. Similarly the Table 51.03-B percentage of openings dependent on distance from another building or property line apply.*

Exception: COMM 59.11 (3) accepts free-standing canopies over fuel dispensing equipment to be within 10 feet of a property line if noncombustible. The provisions of COMM Table 51.03-B will not be applied to these canopies.

Question: *Entry or drive-up canopies are considered to be within the building due to the support columns defining the exterior "wall." Must the canopy construction meet the construction class of the main building if not separated by a class of construction fire wall?*

Answer: *Canopies are typically open-sided structures extending out from the face of the building. They are very similar to a pedestrian-access structure as described in Subchapter VII, COMM 62, except that there is a building on only one end, not both. Obviously, the construction is safer with only one building than it would be if it connected two buildings.*

Thus, open-sided canopies on buildings may meet the construction classification of the main building; or, be separated from the main building by a class of construction separation and stand on its own regarding construction; or, be constructed in accordance with Subchapter VII, COMM 62. If the COMM 62 option is chosen, the canopy must be TOTALLY noncombustible (no built-up roof covering), and the canopy cannot be used for any purpose other than weather protection for the entrance and vehicle unloading area. Unattended vehicles may not be parked under the canopy.

COMM 62 Subchapter VII canopies serving as pedestrian access structures will not have to meet the requirements of COMM Table 51.03-B.

TABLE 51.03-C
HEIGHT LIMITATIONS
BASED ON CLASS OF CONSTRUCTION

Class of Construction	Sprinklered [a&b]		Nonsprinklered	
	Height (in feet)	Number of Stories [c]	Height (in feet)	Number of Stories [c]
Type 1	No Limit	No Limit	60 [d]	No Limit
Type 2	95	9	60 [d]	8
Type 3	85	5	60 [d]	4
Type 4	85	5	60 [d]	4
Type 5A	60	5	50	4
Type 5B	50	4	40	3
Type 6	60	4	50	3
Type 7	50	4	40	3
Type 8	45	3	35	2

[a] - An automatic fire sprinkler system designed and installed in accordance with s. COMM 51.23 is provided throughout the entire building.

[b] - Section COMM 51.02 (21) and (22) may limit or restrict the credit for sprinklers as it applies to the maximum height or number of stories permitted depending upon the type of occupancy involved or whether a reduction in fire-resistive ratings has been utilized.

[c] - The occupancy chapters, chs. COMM 54 to 62, may further limit or restrict the maximum number of stories based upon the type of occupancy involved or the number or type of occupants.

[d] - Section COMM 52.01 requires the installation of sprinklers for buildings more than 60 feet in height.

(1) FIRE-RESISTIVE, TYPE A (NO. 1).

(a) A building is of fire-resistive construction if all the walls, partitions, piers, columns, floors, ceilings, roof and stairs are built of noncombustible material, with a fire-resistive rating as specified in Table 51.03-A.

(b) A building of this classification shall be limited in height in accordance with Table 51.03-C.

(c) Stairs and stair platforms shall be constructed of noncombustible material.

(d) Doors and windows may be of wood except as otherwise specified in s. COMM 51.02 (5), Table 51.03-B, ss. COMM 51.17, 51.18, 51.19 and 51.20, or in the occupancy chapters of this code.

(e) Bays, oriels, and similar exterior projections from the walls shall be constructed of material with fire-resistive ratings as required for exterior walls.

(f) The wall construction behind mansard shall extend to underside of roof deck and shall have a fire-resistive rating of not less than that specified for exterior walls in Table 51.03-A.

(g) Penthouses and other roof structures shall have enclosing walls of noncombustible construction and roof framing and coverings shall be equal to that specified in Table 51.03-A. Wood cooling towers are permitted.

(j) In required fire-resistive floor and roof assemblies one electric outlet box, not exceeding 16 square inches in area, may be installed in such ceilings in each 90 square feet of ceiling area. Recessed electric fixtures shall have protection boxes built above the fixture, constructed of approved fire-resistant material of rating equal to that of the ceiling, to cover the opening in case fixture is displaced. Duct openings in ceilings shall be protected by fire dampers.

(2) FIRE-RESISTIVE, TYPE B (NO. 2).

(a) A building is of fire-resistive construction if all the walls, partitions, piers, columns, floors, ceilings, roof and stairs are built of noncombustible material, with a fire-resistive rating as specified in Table 51.03-A.

(b) A building of this classification shall be limited in height in accordance with Table 51.03-C.

(c) Where roof framing is greater than 20 feet above the floor, or highest level of any balcony, roof decks may be:

1. Matched or splined wood roof decking of not less than 2 inches in nominal thickness;
2. Solid lumber not less than 3 inches in nominal thickness, set on edge securely fastened together;
3. Approved 1 1/8 inch thick plywood with exterior glue, tongue and groove with all end joints staggered and butting on centers of beams spaced not over 4 feet apart; or
4. Other forms of roof decks, if of noncombustible material.

(d) Stairs and stair platforms shall be constructed of noncombustible material.

(e) Doors and windows may be of wood except as otherwise specified in s. COMM 51.02 (5), Table 51.03-B, ss. COMM 51.17, 51.18, 51.19 and 51.20, or in the occupancy chapters of this code.

(f) Bays, oriels, and similar exterior projections from the walls shall be constructed of material with fire-resistive ratings as required for exterior walls.

(g) The wall construction behind mansard shall extend to underside of roof deck and shall have a fire-resistive rating of not less than that specified for exterior walls in Table 51.03-A.

(h) Penthouse and other roof structures shall have enclosing walls of noncombustible construction and roof framing and coverings shall be equal to that specified in Table 51.03-A. Wood cooling towers are permitted.

(3) METAL FRAME/PROTECTED (NO. 3).

(a) A building is of metal frame protected construction if the structural parts and enclosing walls are of metal, or metal in combination with other noncombustible materials, with time resistance ratings as set forth in Table 51.03-A.

(b) A building of this classification shall be limited in height in accordance with Table 51.03-C.

(c) Stairs and stair platforms shall be constructed of noncombustible material.

(d) Bays, oriels and similar exterior projections from the walls shall be constructed of material with fire-resistive ratings as required for exterior walls.

(e) The wall construction behind mansard shall extend to underside of roof deck and shall have a fire-resistive rating of not less than that specified for exterior walls in Table 51.03-A.

(4) HEAVY TIMBER (NO. 4).

(a) A building is of heavy timber construction if the structural frame consists of heavy timber or heavy timber in combination with metal, reinforced concrete or masonry, and all building elements are as set forth in Table 51.03-A unless otherwise exempted.

(b) A building of this classification shall be limited in height in accordance with Table 51.03-C.

(c) *Columns.*

1. Wood columns shall be not less than 8 inches, nominal, in any dimension when supporting floor loads and not less than 6 inches, nominal, in least dimension and not less than 8 inches, nominal, in other dimension when supporting roof loads only.

2. All wood columns in the structural frame shall be superimposed, end to end, one above the other, and joined by metal or wood connectors.

Note: See structural ch. COMM 53 for design requirements.

(d) *Floor framing.*

1. Beams and girders of wood shall be not less than 6 inches, nominal, in any dimension and not less than 45 square inches in actual cross-sectional area.

2. Wood arches which support floor loads shall be not less than 8 inches, nominal, in any dimension.

3. Framed timber trusses supporting floor loads shall have members of not less than 8 inches, nominal, in any dimension.

4. Floor framing and structural framing of material other than wood shall have a fire-resistive protection of not less than one hour.

(e) *Roof framing.*

1. Beams and girders of wood shall be not less than 6 inches, nominal, in any dimension and not less than 45 square inches in actual cross-sectional area.

2. Wood arches, timber trusses, purlins and rafters for roof construction shall have members not less than 4 inches, nominal, in width and not less than 6 inches, nominal, in depth. Spaced members may be composed of 2 or more pieces not less than 3 inches, nominal, in thickness when blocked solidly throughout their intervening spaces or when such spaces are tightly closed by a continuous wood cover plate of not less than 2 inches, nominal, in thickness, secured to the underside of the members. Splice plates shall be not less than 3 inches, nominal, in thickness.

(f) *Floors.*

1. Wood floor construction shall be tongued and grooved, or splined lumber not less than 3 inches nominal thickness, or of solid lumber placed on edge and securely fastened together to make a floor not less than 4 inches, nominal, in thickness. A top layer of flooring of one inch nominal thickness shall be placed over all such floor construction.

(g) Stair construction may be of wood in buildings not exceeding 3 stories in height. In buildings of 4 or more stories, all stairs, platforms and stair construction shall be constructed of noncombustible material.

(h) *Roofs*. Roof decks shall be:

1. Matched or splined wood roof decking of not less than 2 inches in nominal thickness;

2. Solid lumber not less than 3 inches in nominal thickness, set on edge securely fastened together;

3. Approved 1 1/8 inch thick plywood with exterior glue, tongue and groove with all end joints staggered and butting on centers of beams spaced not over 4 feet apart; or

4. Other forms of roof decks, if of noncombustible material.

(i) Bays, oriels, and similar exterior projections from the walls shall be constructed of material with fire-resistive ratings as required for exterior walls.

Please note that Table 51.03-A permits substitution of totally noncombustible systems carrying a 1-hour fire-resistive rating for many of the building elements.

(5) EXTERIOR MASONRY, PROTECTED AND UNPROTECTED (NOS. 5A AND 5B).

(a) A building is of protected or unprotected exterior masonry construction if all exterior walls are constructed of masonry or reinforced concrete or of other materials in combination with a minimum 6-inch nominal masonry wall and all building elements are as set forth in Table 51.03-A unless otherwise exempted.

***Question**: In type 5 construction, what material and fire-resistive rating is required for columns such as those supporting canopies or decks, supporting columns in large window openings, columns encapsulated within exterior walls, etc.*

***Answer**: Exterior columns which are in the plane of the wall as specified in COMM 51.01 (139a), definition of volume, shall be of the fire rating as specified for exterior walls in Table 51.03-A.*

Columns supporting cantilevers which are 2 feet or less shall be considered exterior columns and shall comply with exterior wall requirements as specified above.

Columns supporting cantilevers which are greater than 2 feet shall be of the fire rating as specified in Table 51.03-A for either exterior walls or interior supports, whichever is more restrictive.

Exterior columns or columns embedded within the walls of Type 5A or 5B construction shall maintain the fire rating as specified in Table 51.03-A for exterior walls but are not required to have a 6-inch nominal masonry covering.

(b) A building of this classification shall be limited in height in accordance with Table 51.03-C.

(c) The interior structural framing shall be metal, reinforced concrete, masonry or wood. Fire protection of metal or wood structural members shall be as specified in Table 51.03-A.

(d) In walls where fire protection is required, the bottom of lower flange of steel lintels supporting load-bearing masonry shall be protected for openings exceeding 12-foot spans.

(e) Floors, roofs, partitions and stairs may be of wood but no joist, rafter, stud, stringer, truss member or top and bottom member of a wood I-Beam may be less than 2 inches in nominal thickness.

(f) Bays, oriels and similar exterior projections from the walls shall be constructed of material with fire-resistive ratings as required for exterior walls.

(g) The portion of exterior wall above the bearing points of the roof structural framing system and enclosing non-occupied space shall be considered part of the roof construction and shall comply with the requirements of Table 51.03-A for roof framing.

This code provision allows gable end walls enclosing unoccupied attic spaces to be constructed without masonry exterior. The construction must meet the combustibility requirement and hourly rating indicated on lines 5 through 9 of Table 51.03-A.

(6) METAL FRAME/UNPROTECTED (NO. 6).

(a) A building is of metal frame unprotected construction if the enclosing walls are of unprotected metal or unprotected metal in combination with other noncombustible materials and all building elements are as set forth in Table 51.03-A unless otherwise exempted.

1. Heavy timber may be used for interior columns and floor framing.

2. Interior mezzanines and balconies within the first story may be constructed of one-hour fire-resistive construction.

The basic code requirement for floor systems in Type 6 buildings is that the floors shall be noncombustible with no fire rating or combustible 1-hour rated. The elements of the mezzanine or balcony can be mixed such that a combustible 1-hour floor system may be supported with noncombustible supports carrying no rating and a NC-0 system can be supported by combustible supports which have a 1-hour rating.

(b) A pole building is considered type No. 6, metal frame unprotected construction, provided the following conditions are satisfied:

Items (b)1. through 5. below ***pertain only to pole buildings.***

Question: *A pole building is normally Type 8 construction, however, if certain requirements are met, the building can be classified as metal frame unprotected, Type 6. Two story or more Type 6 buildings are required to have noncombustible roof construction which prohibits the use of wood trusses. May a two-story pole building be classified as Type 6 construction?*

Answer: *No. Pole buildings of Type 6 construction must meet the requirements of COMM 51.03 (6)(b), and are limited to one story due to the restriction on roof construction in Table 51.03-A, lines 5, 6, and 7. A typical pole building with wood trusses and purlins, if more than one story, must be classified Type 8 construction, subject to the restrictions of that construction classification. A pole building utilizing steel trusses, purlins and decking may be more than one story.*

1. The poles supporting the roof only shall be at least 6 inches by 8 inches nominal in dimension. Poles supporting floors shall be 8 inches by 8 inches nominal in dimension. Poles may be built up from individual 2-inch nominal lumber if the pieces are bolted or glued and nailed together;

Question: *May the nonstructural end wall columns be less than 6 inches by 8 inches nominal? Also, what is the minimum pole size for built-up or laminated members?*

Analysis: *A research of the code history found that garages were not allowed to be wood frame unless several other safe guards, like increased setbacks, were provided. To allow wood pole*

buildings as garages, Type 6 pole buildings were created. The code intent was to have heavy columns for fire-resistivity purposes.

The size requirement for columns in a Type 6 building is based on the ability of the column to resist fire. The column sizes correspond to COMM 51.045, Table 2, line 25, for 1-hour fire-rated construction. The column may have to be increased in size based on structural consideration.

***Answer:** The **minimum** size of **any** column in a Type 6 pole building shall be 6 inches by 8 inches, nominal, in any dimensions regardless of its load-bearing function. Poles supporting floors shall be a minimum of 8 inches by 8 inches, nominal, in dimension. A nominal pole may be built up of nominal lumber bolted or glued and nailed together in such a manner that a 6-inch by 8-inch nominal column is at least 5.5 inches by 7.5 inches, actual size, and an 8-inch by 8-inch nominal column is at least 7 1/2 inches by 7 1/2 inches, actual size.*

Laminated wood columns shall be at least the minimum size specified above.

2. The girts shall be of noncombustible, fire-retardant treated wood or heavy timber construction;

3. The enclosing wall skin shall be of noncombustible materials. A non-structural 2" x 6" nominal wood skirt is permitted if it is in contact with the ground or foundation;

***Question**: How does Table 51.03-A apply to Type 6 pole buildings closer than 10 feet to a property line or another building?*

***Analysis:** Table 51.03-A requires the walls of Type 6 buildings which are closer than 10 feet to a property line or other building to be NC-2-hour rated if a bearing wall and NC-1-hour if a nonbearing wall. NC means noncombustible. The purpose of these increased ratings is to reduce the possibility of fire spreading from one building to another. A Type 8 wood frame building is required to have a 4-hour wall if closer than 10 feet to a property line or another building; thus it is logical to at least require the Type 6 pole building walls to be noncombustible and rated to achieve the same fire protection as a metal building.*

***Answer:** When the walls of a Type 6 pole building are required to be NC-1 or NC-2, the wood poles cannot be part of the wall. The wall including the girts must be noncombustible and rated accordingly. Also note 51.02 (12) parapet requirements.*

4. The roof cover shall have a class B rating or better; and

5. All other requirements of this section and Table 51.03-A are satisfied.

(c) A building of this classification shall be limited in height in accordance with Table 51.03-C.

(d) Stairs and stair platforms may be of wood with stringers not less than 2 inches in nominal thickness.

(e) Bays, oriels and similar exterior projections from the walls shall be constructed of material with fire-resistive ratings as required for exterior walls.

(7) WOOD FRAME/PROTECTED (NO. 7).

(a) A building is of wood frame protected construction if the structural parts and enclosing walls are of protected wood, or protected wood in combination with other materials, with fire-resistive ratings at least equal to or better than those set forth in Table 51.03-A. Except as specified in s. COMM 51.03 (5) (a), if such enclosing walls are veneered, encased or faced

with stone, brick, tile, concrete, plaster or metal, the building is also termed a wood frame protected building.

(b) A building of this classification shall be limited in height in accordance with Table 51.03-C.

(c) Floors, roofs, partitions and stairs may be of wood but no joist, rafter, stud, stringer, truss member or top and bottom member of a wood I-Beam may be less than 2 inches in nominal thickness.

(d) The structural members supporting the finished ceiling in the topmost story shall be protected on the underside by fire-resistive material acceptable in systems approved for one-hour fire-resistive ratings as covered in s. COMM 51.04.

(e) Buildings of wood frame protected construction may be located less than 10 feet from a property line provided any wall closer than 10 feet from a property line is a 4-hour fire division wall, without openings, as specified in s. COMM 51.02 (13).

(f) Bays, oriels and similar exterior projections from the walls shall be constructed of material with fire-resistive ratings as required for exterior walls.

(8) WOOD FRAME/UNPROTECTED (NO. 8).

(a) A building is of wood frame unprotected construction if the structural parts and enclosing walls are of unprotected wood, or unprotected wood in combination with other materials as set forth in Table 51.03-A. If such enclosing walls are veneered, encased or faced with stone, brick, tile, concrete, plaster or metal, the building is also termed a wood frame unprotected building.

(b) A building of this classification shall be limited in height in accordance with Table 51.03-C.

(c) Floors, roofs, partitions and stairs may be of wood but no joist, rafter, stud, stringer, truss member or top and bottom member of I-Beam may be less than 2 inches in nominal thickness.

(d) Buildings of wood frame unprotected construction may be located less than 10 feet from a property line provided any wall closer than 10 feet from a property line is a 4-hour fire division wall, without openings, as specified in s. COMM 51.02 (13).

Fire-Resistive Standards for Materials of Construction

COMM 51.04 SCOPE.

This section shall include standards applicable to various types of fire-resistive construction. Requirements established herein are considered minimum safety standards and will not necessarily result in the most advantageous insurance rates.

COMM 51.042 GENERAL REQUIREMENTS.

(1) Construction details and the quality of materials used for fire-resistive assemblies shall be those used by the testing laboratory for the listed test assembly or those recognized by good engineering practice, including:

Question: *Tested and listed fire resistive assemblies often require the use of* ***proprietary materials****, not only specifying the standard, but also specifying the manufacturer of the material or element. May a framing element, particularly a manufactured framing element such as wood floor and roof trusses, from a manufacturer other than those listed be utilized in the assembly?*

Answer: *COMM 50.12 (3)(b) 4. requires that the design number of fire- resistive assemblies be shown on the plans submitted for review. If the listing for that chosen design indicates proprietary framing members, the framing members must be obtained from that listed proprietary manufacturer(s). Any approved truss may be utilized in assemblies which do not specifically indicate a proprietary truss manufacturer such as those in the US Gypsum Director and UL-528.*

This does not apply to structural elements supporting finish ratings materials, which are dependant on the spacing of the supports and method of attachment, including any channels, of the finish to the supports only, and are not concerned with the framing members to achieve the desired finish rating.

At this time, the Department will adhere to proprietary requirements only for the framing members.

(a) The addition of mineral fiber or glass fiber insulation within a stud cavity without reducing the fire-resistive rating of wall or partition assembly when not specified as the listed assembly;

(b) The substitution of studs with greater depths than those specified in a listed wall or partition assembly without reducing the fire-resistive rating of the assembly;

(c) An increase in the distance between parallel rows of studs, such as in chase wall assemblies, greater than those specified in listed wall or partition assemblies without reducing the fire-resistive rating of the assembly; and

(d) Assemblies detailed in GA-600.

When using tested and listed assemblies, no deviations from the listed design are permitted. The assembly must be constructed exactly as shown in the listing with no additions, deletions or substitutions of material. The department will permit noncombustible insulation in the stud space of a 1-hour rated wall or partition (even though the tested assembly does not indicate insulation); the substitution of deeper studs and joists than those shown in the tested assembly; and an increase in the distance between parallel rows of studs greater than that specified in the listed assembly.

The department will not permit insulation in the stud space of walls rated more than 1-hour unless the tested assembly includes insulation, and the department will not permit insulation in a listed floor/ceiling or roof/ceiling assembly of any rating unless the listed assembly includes that insulation. Although the department will permit deeper studs and joists, the department will not permit substitution related to kind of stud or joist, such as substitution of open web wood joists for the listed dimensioned lumber joists.

Also see COMM 57.02 (2) commentary.

Vapor barriers are permitted to be installed in fire rated construction.

Question: *Can a finish rating achieved without construction of an entire complete tested assembly be utilized instead of the fire assembly if the finish rating satisfies the fire-resistive rating requirements by the code.*

Answer: *The finish rating is determined by the same tests conducted by approved testing laboratories, thus is acceptable by the department.*

Care should be taken to assure the finish rating is utilized appropriately. Since the finish rating only provides protection from one side, finish ratings may be utilized for isolation of hazard or similar separation purposes when installed on the side facing the hazard.

The finish rating shall consist of the tested membrane attached to supports spaced as specified by the assembly.

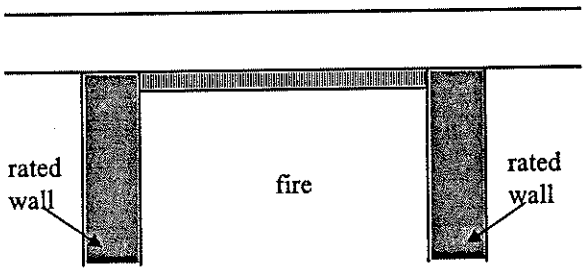
Question: *How must floor/ceiling assemblies be constructed/supported for isolation of hazard, firewall, and rated passageway requirements? May framing be continuous? May interior finish ratings be utilized?*

Analysis: *In applying intent of the code, it is necessary to consider where the fire is and what should be protected from the fire. Then the "weakest link theory" should be utilized in evaluating what protection is required to be certain the required assembly stays in place for its specified time. If the failure of an element (weakest link) will cause failure of the assembly, then that element must also be protected to achieve the same fire-resistive rating as the assembly.*

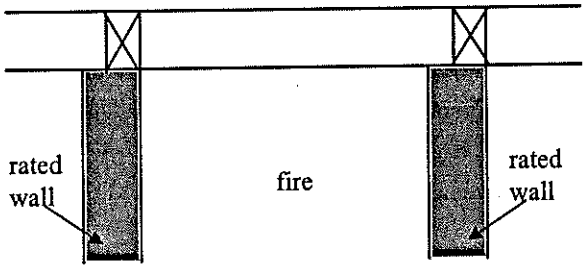
Answer: A. Isolation of hazards.

The intent of the code is to provide fire-resistive assemblies to contain a fire in the hazardous area for a specified time.

This can be accomplished by using finish ratings attached as required for an assembly or by utilizing the complete assembly. See illustrations below.

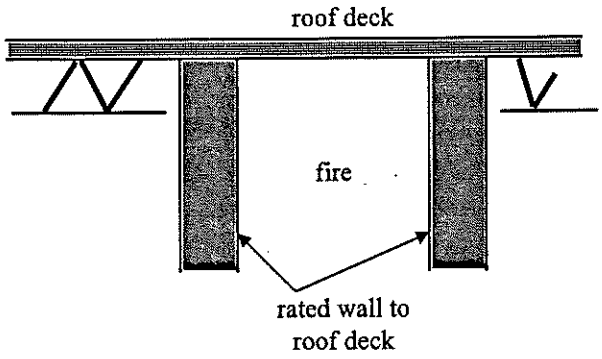


Nonrated ceiling assembly
Ceiling structure may be a rated interior finish attached as per a rated assembly. (Note: A separate fire-resistive ceiling may be constructed below a structural ceiling system.)



Rated ceiling assembly
Ceiling structure may be continuous. Firestopping is required to prevent fire from spreading into the assembly after the ceiling membrane is penetrated.

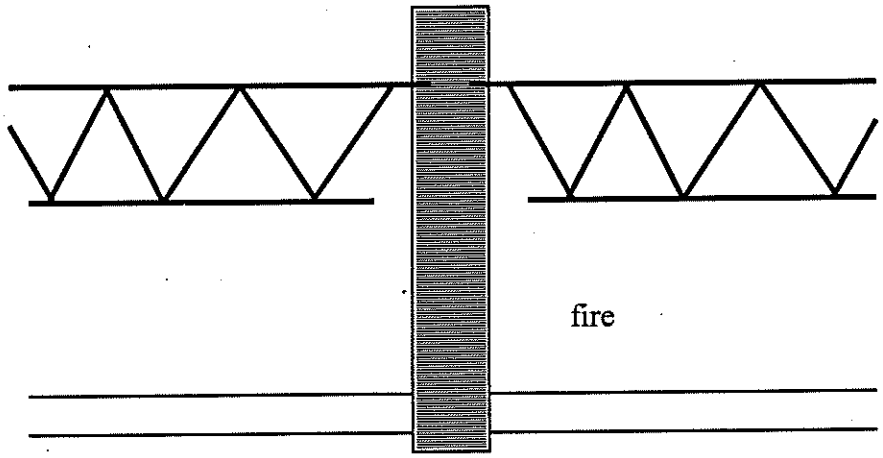
Alternatively, walls constructed with 1- and 2-hour ratings to isolate hazards, provided for garage separations and furnace rooms, may terminate on the underside of the roof deck over the hazardous area, and the roof construction may be combustible. In this case, the framing systems over the hazardous area and the adjoining area must be separate systems, and the framing may not be continuous over the fire wall. Remember, this provision applies only to walls of 1-hour and 2-hour rating.



Rated walls continuous to roof deck

B. Fire division walls.

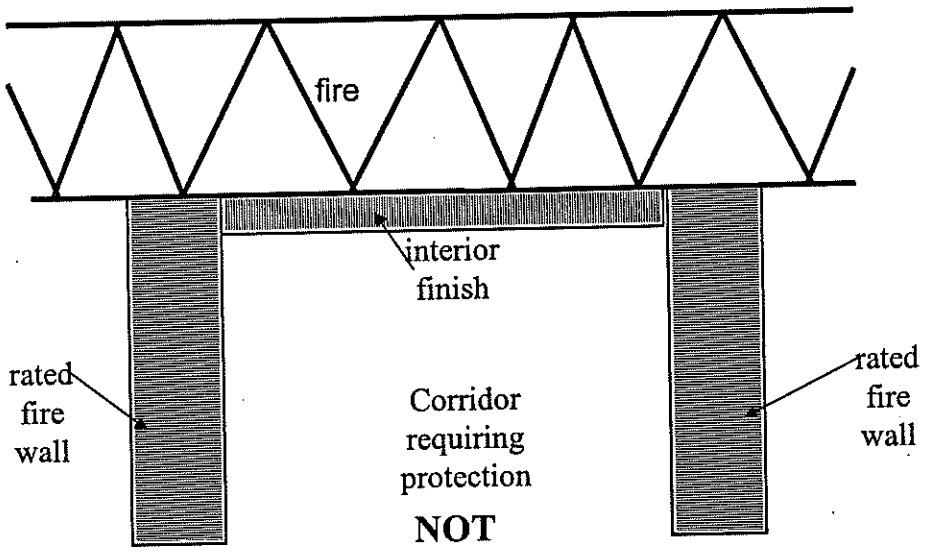
The intent of the code is to provide a fire barrier to prevent the passage of fire from one side of the wall to the other. Since fire may occur on either side of the wall, the collapse of building elements on either side of the wall must not affect the wall's integrity; thus structural members must not continue through or over the firewall.



C. Rated stairways and corridors.

The intent of the code is to provide an exit passageway that is safe from the effects of a fire ***outside*** *the passageway. Since the fire is outside the passageway, a finish rating provided on the inside of the passageway does* ***not*** *serve the intended purpose. The fire-resistive assemblies utilized to provide rated corridors must be supported by similar rated construction in a manner such that the collapse of a nonrated building element will not affect the corridor safety.*

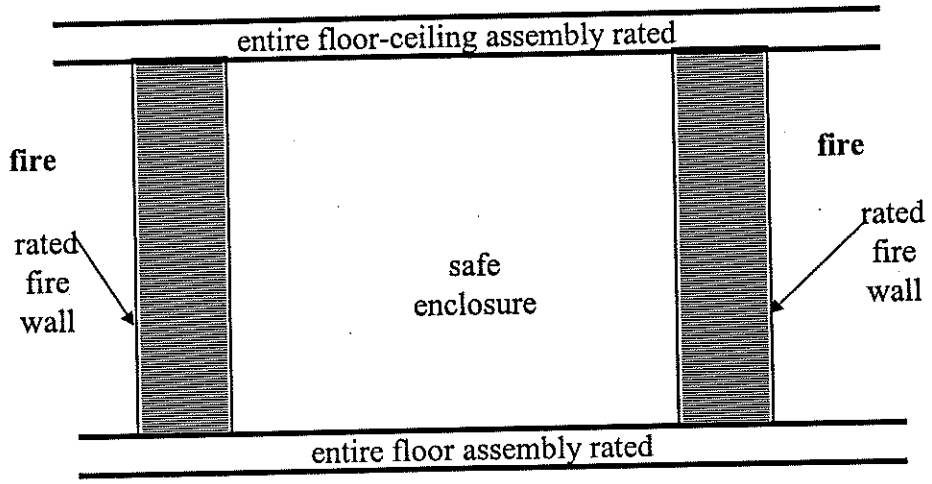
Fire will cause the collapse of the element supporting the interior finish, thus utilizing an interior finish membrane only is not acceptable:



NOT ACCEPTABLE

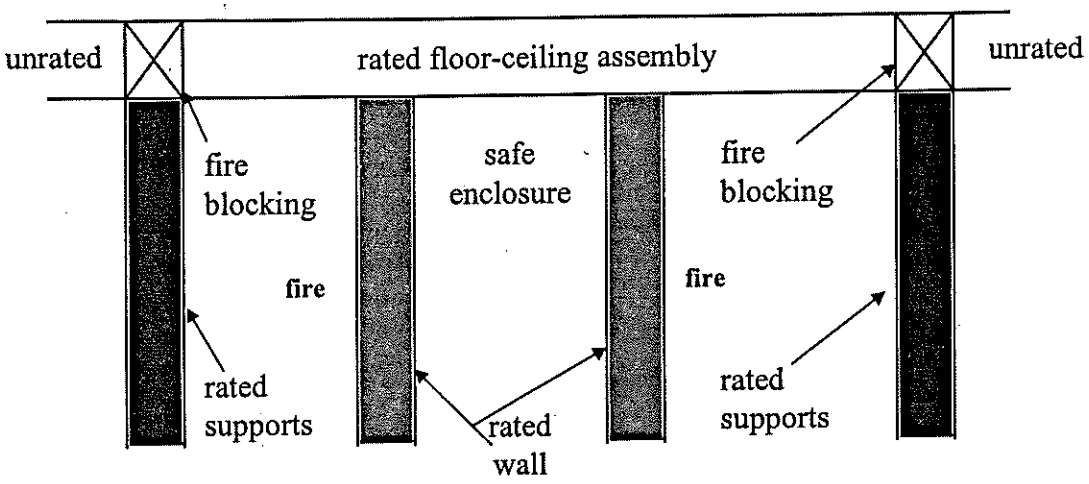
Acceptable options include:

1. A rated assembly continuous over a rated corridor providing the entire floor/ceiling system is rated:



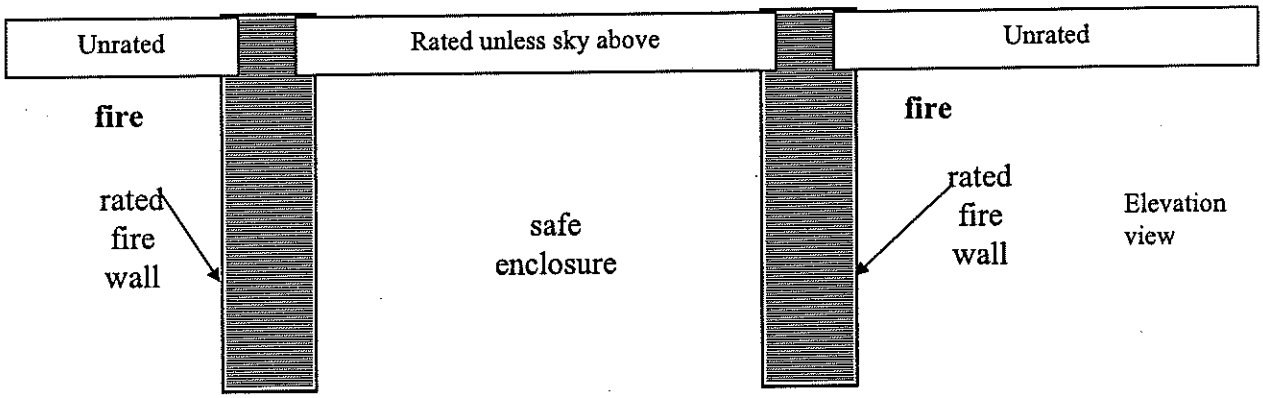
ACCEPTABLE

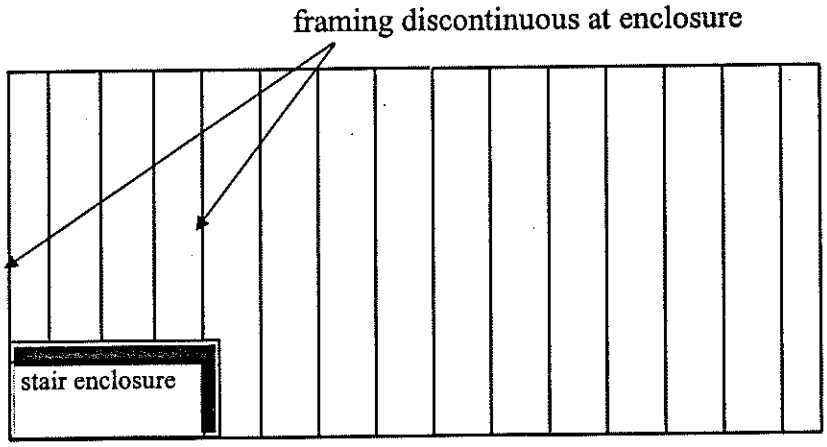
2. A rated assembly continuous over a rated corridor providing the entire floor/ceiling system extends to the next supports, which are also rated, and the floor-ceiling assembly is fire-blocked for its full depth



ACCEPTABLE

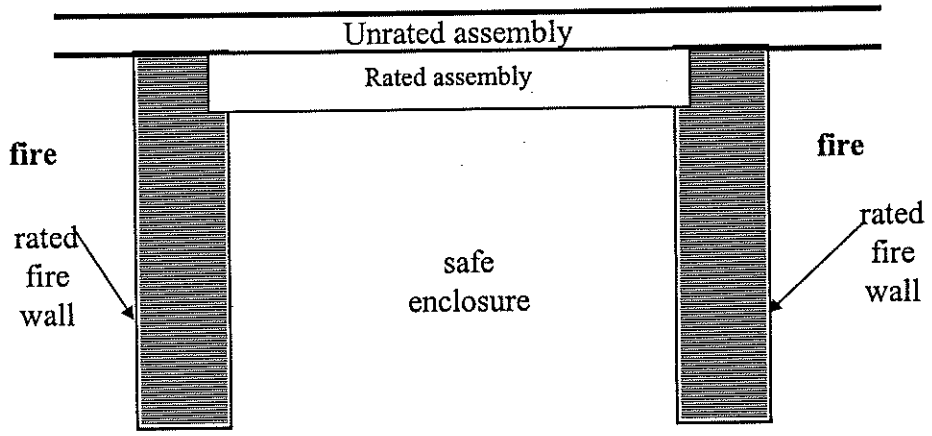
3. Installing framing so that it will be discontinuous at the enclosure:





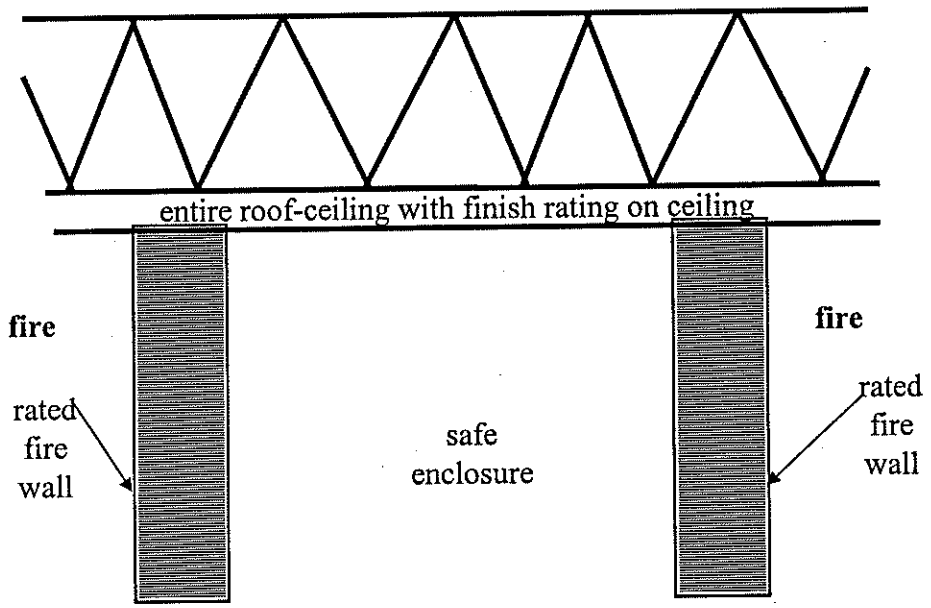
ACCEPTABLE

4. Capping just the stair or corridor enclosure with a rated floor-ceiling assembly below the overall floor-ceiling or roof-ceiling. The rated floor-ceiling assembly and supporting walls must be designed to carry the weight of the unrated roof-ceiling or floor-ceiling assembly if it fails in a fire situation:



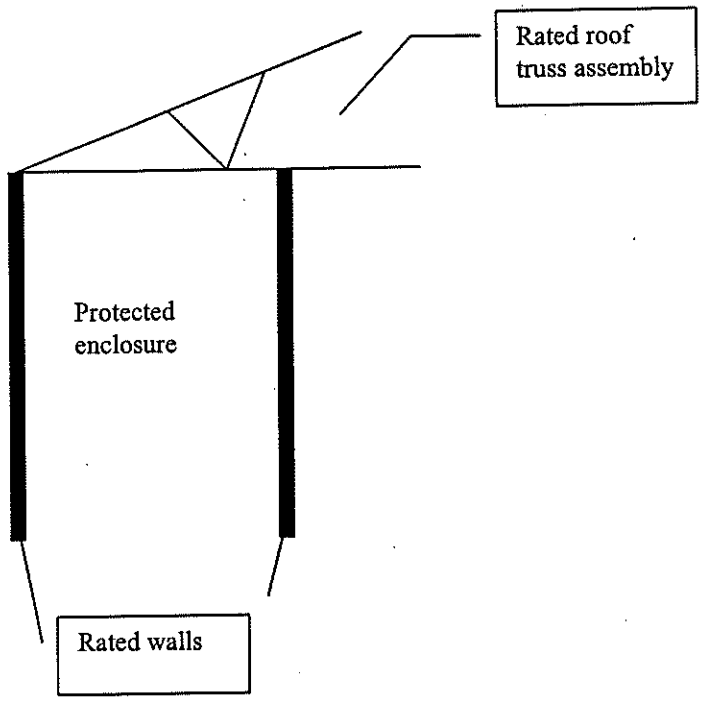
ACCEPTABLE

5. Providing an equivalent finish-rating under the whole ceiling or to surrounding structural members that are boxed vertically to the underside of the roof deck with fire-rated construction:



ACCEPTABLE

6. Providing a proprietary one-hour rated roof truss assembly for the whole roof or for an area above the enclosure and then vertically boxing the trusses with fire-rated construction to the underside of the roof deck:



Question: *Many of the floor/ceiling and roof/ceiling assemblies shown in the various fire-resistive design manuals and COMM 51.045 Table 2 do not indicate any penetrations (diffusers, light fixtures, etc.) to the ceiling membrane. Are any penetrations to the ceiling membranes allowed, and if allowed, what restrictions apply?*

Answer: *In fire-resistive assemblies not specifying duct/diffuser openings or recessed lights, the department will permit duct diffuser openings in ceilings provided they are properly protected by classified "ceiling dampers" or insulated per Diagrams A or B of the air ducts and protection system found in the general section of the UL Fire-Resistive Directory, Volume 1. The size shall be limited to 100 square inches maximum single diffuser opening and not more than 100 square inches for each 100 square feet of ceiling area. Also, in many areas of the code, such as 51.06 (foam plastic thermal barriers) and 57.01 (2) (living unit separations), only fire-resistive membranes (not the entire rated assembly) are called for. The fact that these are only membranes does not mean that penetrations to the membranes do not receive protection. Penetrations to these types of membranes must be protected the same as any penetration to the membrane portions of complete fire-resistive rated assemblies.*

(2) The minimum fire-resistive protection of a connection shall be equal to the maximum required for the members to which it is attached.

(3) For structural components with a fire-resistive rating obtained by test with restrained ends, the supporting structure shall be designed to provide for this restraint.

(4) All products manufactured and tested according to ASTM standard methods prior to the effective dates of the standards specified in ASTM E 119 shall be accepted unless the ASTM standard method used in the test is judged to be inadequate in comparison with the most currently adopted standard method.

(5) The heat transmission requirements of ASTM E-119, with the exception of high hazard areas, penal and health care facilities and warehouses for combustible materials, may be reduced to one-half (1/2) of the hourly rating required by this code, but not less than one hour.

(a) The fire-resistive rating for structural integrity required by this code shall be maintained where the heat transmission criteria has been reduced.

(6) The use of fire-resistive protection implies consent by owner to maintain material in a serviceable condition. Where this protection is concealed, provisions shall be made for periodic visual inspection of the structural insulating material at each story.

(7) In one-hour fire-resistive rated construction and in living unit separations as specified in s. COMM 57.01 (2), the ceiling may be omitted over unusable crawlspace not more than 42 inches in height and the flooring may be omitted where unusable space occurs above.

(8) Structural elements which support building components or assemblies required to have a fire-resistive rating shall be protected to afford at least the same fire-resistive rating of the component or assembly supported.

COMM 51.043 APPROVED RATING METHODS.

(1) Ratings of fire-resistive assemblies shall be determined by one of the following methods:

(a) Test by approved testing laboratories (see s. COMM 51.044).

(b) Typical examples as listed in this code in lieu of approved test (see s. COMM 51.045).

(c) Approved method of calculation in lieu of approved test (see s. COMM 51.046).

The source of fire-resistive assemblies must be shown on the plans. If selecting a design from a fire-resistance directory, such as Underwriters Laboratories, Gypsum Association, etc., the design number must be on the plans. If selecting a design from the tables included with this code section, the plans must indicate that fact and include the row number used. If utilizing calculations in lieu of approved tests, the calculations for each assembly must be included in the plan submittal package. Failure to show the source of the fire-resistive design will result in delay in processing of plans.

COMM 51.044 TESTING LABORATORIES.

Fire rating tests conducted by testing laboratories recognized under s. COMM 50. 19 shall be acceptable.

APPROVED TESTING LABORATORIES. The following laboratories have been approved by the department under s. COMM 50.19. This list is current as of the date of printing this code. Additions and deletions may occur during the effective period of this code. Testing Laboratories may also be approved via the material approval process. ***For information regarding the current status of a testing laboratory, call 608-266-1542.***

TABLE A-51.044
APPROVED TESTING LABORATORIES

		ASTM STANDARD TEST						
	Name of Recognized Laboratory	E-84	E-108	E-119	E-136	E-152	E-163	E-648
1.	Applied Research Laboratories, Inc. Miami, FL	X	X	X	X	X	X	X
2.	Commercial Testing Co., Inc. Dalton, GA	X	-	X	X	X	-	X
3.	Construction Technologies, Lab. Skokie, IL	-	-	X	-	-	-	-
4.	Factory Mutual Research Corp. Norwood, MA	X	X	X	X	X	X	X
5.	Forest Product Laboratories Madison, WI	-	-	X	-	X	-	X
6.	Hardwood Plywood Mfgrs. Assoc. Reston, VA	X	-	-	-	-	-	X
7	Northwest Testing Lab, Inc. Portland, OR	-	-	X	-	X	X	-
8.	Omega Point Laboratories, Inc. San Antonio, TX	X	X	X	X	X	X	X
9.	PFS Corporation Madison, WI	X	-	X	-	X	-	-
10.	Radco Carson, CA	X	-	-	-	-	-	-
11.	Southwest Research Institute San Antonio, TX	X	X	X	X	X	X	X
12.	Underwriters Lab., Inc. Northbrook, IL	X	X	X	X	X	X	X
13.	University of California--Berkley Richmond, CA	-	X	X	-	-	-	-
14.	U.S. Testing Co. Fairfield, NJ	X	X	-	X	-	-	X
15.	U.S. Testing Co. Los Angeles, CA	X	X	-	X	-	-	X
16.	VTEC, Inc. Bronx, NY	X	X	X	X	-	-	X
17.	Warnock Hersey Intnl-Inc. Pittsburg, CA	X	X	X	-	X	X	-

* Reference based on research and development data. Facility is not available for conducting routine rating tests.

The following laboratories have been approved via the material approval process. The material approval should be reviewed to determine limitations.

Laboratories

Manufacturer
Approval Number

1. *Applied Research Labs., Inc.*
   5371 N.W. 161st Street
   Miami, FL 33014
   900047-C

2. *Commercial Testing Co., Inc.*
   1215 South Hamilton Street
   P.O. Box 985
   Dalton, GA 30722
   900046-C

3. *Construction Techn. Labs.*
   5420 Old Orchard Road
   Skokie, IL 60077
   900048-C

4. *Factory Mutual Research*
   1151 Boston-Providence Turnpike
   Norwood, MA 02062
   910120-C

5. *Hardwood Plywood Mfgr. Assoc.*
   1825 Michael Faraday Drive
   P.O. Box 2789
   Reston, VA 22090
   900063-C

6. *Northwest Testing Lab.*
   5405 North Lagoon Avenue
   Portland, OR 97217-0126
   890052-C

7. *Omega Point Labs., Inc.*
   6868 Alamo Downs Parkway
   San Antonio, TX 78238
   900033-C

8. *PFS Corporation*
   2402 Daniels Street
   Madison, WI 53704
   900058-C

9. *RADCO*
   P.O. Box 5506
   Carson, CA 90749
   910021-C

10. *Southwest Research Institute*
    6220 Culebra Road
    P.O. Drawer 28510
    San Antonio, TX 78284
    900035-C

11. *U.S. Testing Company*
    5555 Telegraph Road
    Los Angeles, CA 90040
    900064-C

12. *U.S. Testing Company*
    291 Fairfield Avenue
    Fairfield, NJ 07004
    900049-C

13. *USDA Forest Service*
    Forest Products Laboratory
    One Gifford Pinchot Drive
    Madison, WI 53705
    900054-C

14. *Underwriters Lab., Inc.*
    333 Pfingsten Road
    Northbrook, IL 60062
    900050-C

15. *VTEC Laboratories, Inc.*
    212 Mandia Street
    Bronx, NY 10474
    890056-C

16. *Warnock Hersey Int., Inc.*
    1101 Loveridge Road
    Pittsburg, CA 94565
    900055-C

17. *Warnock Hersey Int., Inc.*
    8431 Murphy Drive
    Middleton, WI 53562
    890032-C

COMM 51.045 TYPICAL EXAMPLES OF FIRE-RESISTIVE STRUCTURAL COMPONENTS.

(1) Basic design and construction for specified fire-resistive protection of structural components listed in table 2, including references (a) through (r), shall be acceptable.

Note: The following table is based on performance, interpretation of various test data or data from ASTM E-119 test (see table 2). *Note: The examples shown in this section include no provisions or general requirements concerning penetrations to membranes forming the assembly. The division will normally accept and follow provisions found within the UL Fire Resistive Directory.*

The following lettered paragraphs are referenced by the underlined letters in the table.

(a) *Types of concrete.*

1. Type I—normal weight concrete with lime-stone, calcareous gravel and air-cooled slag aggregate.

2. Type II—normal weight concrete with siliceous gravel, granite or quartz aggregate containing more than 40% quartz, chert or flint. Values given for Type I apply except where values are tabulated for Type II.

3. Type III—lightweight aggregate with expanded slag, shale or clay aggregate. Includes sanded--lightweight concretes not over 115 lbs. per. cu. ft. oven-dried density.

(b) Cover on reinforcing steel is for sides and bottoms. Where tensile reinforcing elements have different cover, the tabulated cover is the average of the minimum values of the individual elements. The cover of an individual element shall not be less than 1/2 the tabulated value. Top cover to be a minimum of 3/4 inch.

Particularly note the required covering for rebars in this table. The thickness of this covering or a material approval number for the assembly should be noted on the plan.

(c) For the heat transmission requirements of floor and roof construction, the thickness of the top slab may be reduced if noncombustible insulation is directly applied to either side of the slab and provided the U-factor is equaled or reduced.

(d) The thickness of top slab is in accordance with ASTM E-119 heat transmission requirements. For variations in thickness of top slab see s. COMM 51.042 (5).

Note: For ASTM E-119 standard adopted see COMM 51.25 (49).

(e) Longitudinal joints between individual precast floor or roof units, or individual wall units shall be installed as tested or shall be grouted solid for the thickness required by the fire-resistive rating. Noncombustible insulation may be substituted for the grout if the U-factor is equaled or reduced providing the integrity of insulation remains as installed. The topping used in floor or roof units may be included.

(g) Equivalent thickness = $\frac{\text{Total volume minus volume of voids}}{\text{length times height}}$

(h) t^2-equivalent thickness = $\frac{\text{Total volume minus volume of voids}}{\text{length times height}}$

(i) Clay, shale, concrete or sand lime—with less than 25% voids or with all spaces filled.

(j) 1 1/2-inch space between column and masonry unit—no fill required.

(k) For restrained conditions, thickness of fire protection may be reduced if substantiated by test data or calculation method.

(l) Elements with this minimum size are recognized for heavy timber construction, acceptable for certain buildings in lieu of 1-hour noncombustible construction.

(m) Where combustible members are framed into a wall, the wall shall be of such thickness or be so constructed that the fire barrier between the member and the opposite face of the wall, or between adjacent members set in from opposite sides will be 93% of the equivalent thickness shown in Table 2.

(n) Cover thickness on reinforcing steel as indicated is based on continuity of system. For simple span conditions increase cover thickness by 50%.

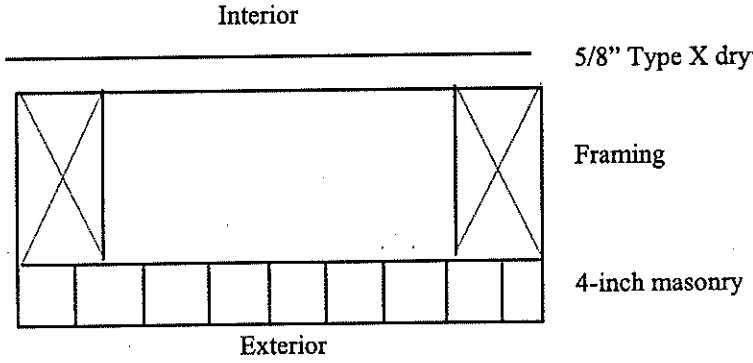
(p) Wire mesh reinforced and with a minimum area of 0.015 inches square per foot of length or equivalent.

(q) 5/8 gypsum wallboard shall be type "X" or "C".

The type "X" reference is relating to the ASTM definition for gypsum wallboard having specific fire-resistant characteristics (see ASTM C11).

(r) The specified hourly rating may be increased by 2 hours if the cores are filled with loose, dry expanded slag, water repellent vermiculite or burned clay or shale.

Question: *May 4-inch masonry serve as a substitute for the membrane of a 1-hour tested listed wall assembly?*



Analysis: *COMM allows three methods for accepting rated construction design.*

1. *Tested, listed assembly;*
2. *Typical examples illustrated in COMM 51.045, Table 2; and*
3. *Calculation method to interpolate between known assemblies.*

Table 2 in lines 11, 12, and 13 indicate free-standing, 4-inch masonry would have a 1-hour rating. Several UL wall assemblies utilize 4-inch masonry as a membrane for 2-hour rated assemblies. The most common 1-hour rated wood frame wall is comprised of a layer of 5/8" Type X drywall, framing, and a layer of 5/8" Type X drywall. Four inches of masonry is obviously as good as a layer of 5/8" Type X drywall.

Answer: *Yes, the department will accept a 4-inch masonry membrane as a substitute for a membrane in a 1-hour rated wall where the other elements of the wall are constructed in accordance with a 1-hour rated, tested, listed assembly.*

Table 2
TYPICAL EXAMPLES OF FIRE-RESISTIVE STRUCTURAL COMPONENTS

Components Without Applied Protection—
CONCRETE CAST IN PLACE AND PRECAST MILD STEEL REINFORCEMENT

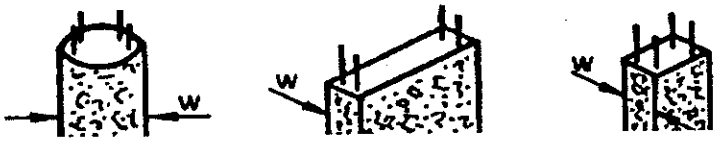
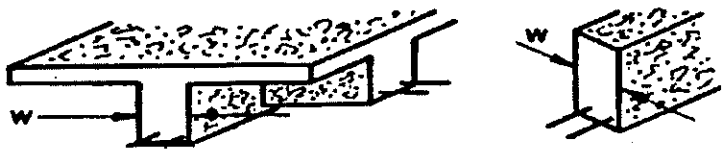
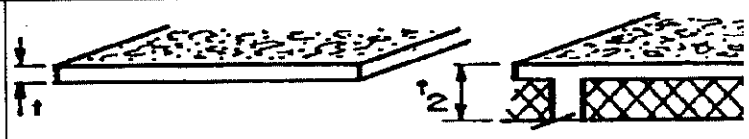
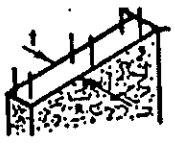
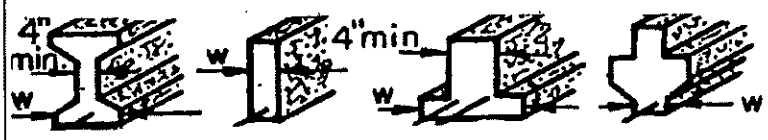
Row No.	Structural Components	Insulating Material	Description	Sketch & Minimum Requirements	4 Hour			3 Hour			2 Hour			1 Hour		
					I	II	III	I	II	III	I	II	III	I	II	III
1.	Columns	Concrete Type I, II & III a b	Reinf. Cover		2	2	2	2	2	2	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½
			Min. Dim. & Area-Sq. In.		12-144			10-120			8-64			6-48		
2.	Girders and Beams	Concrete Type I, II & III a b n	Reinf. Cover		2	2	2	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½	1	1	1
			Width (w)		8	8	8	8	8	8	6	6	4	4	4	4
3.	Joists and Waffles without Fillers or Partial Fillers of Masonry or Clay Tile Filler	Concrete Type I, II & III a b c d e h n	Reinf. Cover		1	1	1	1	1	1	¾	¾	¾	¾	¾	¾
			Width Web (w)		6	6	6	5	5	5	4	4	4	4	4	4
			Th. Top Slab (t)		6 ¾	7	5 ½	5 ¾	6 ¼	4 ¾	4 ¾	5	3 ¾	3 ¼	3 ½	2 ¾
4.	Slabs or Joists and Waffles with Masonry or Clay Tile Filler	Concrete Type I, II & III a b c d e h n	Reinf. Cover		1	1	1	1	1	1	¾	¾	¾	¾	¾	¾
			Th. Top Slab (t)		6 ¾	7	5 ½	5 ¾	6 ¼	4 ¾	4 ¾	5	3 ¾	3 ¼	3 ½	2 ¾
5.	Walls and Partitions Bearing and Nonbearing	Concrete Type I, II & III a b c	Reinf. Cover		1	1	1	1	1	1	¾	¾	¾	¾	¾	¾
			Thickness (t)		6	6 ½	5	5	5 ½	4 ½	4	4 ½	4	3	3	3

Table 2 (continued)

Components Without Applied Protection—
CONCRETE PRECAST & CAST IN PLACE POST-TENSION OR PRE-TENSIONED SIMPLE SPAN

Row No.	Structural Components	Insulating Material	Description	Sketch & Minimum Requirements
				

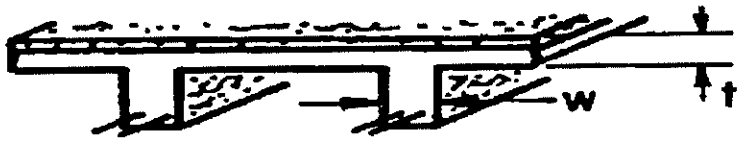
Row No.	Structural Components	Insulating Material	Description	4 Hour		3 Hour		2 Hour		1 Hour	
				I & II	III	I & II	III	I & II	III	I & II	III
6.	Girders and Beams	Concrete Type I, II & III a b k	Ave. Cover	3 ½	3	3	2 ¾	2 ½	2	1 ¾	1 ¾
			(w)	11	10	9 ½	8	7	6 ¼	4	4



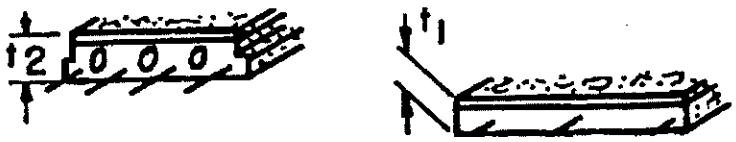
Row No.	Structural Components	Insulating Material	Description	4 Hour			3 Hour			2 Hour			1 Hour		
				I & II		III	I & II		III	I & II		III	I & II		III
7.	Joists and Waffles	Concrete Type I, II & III a b c d e k	Ave. Cover	3 ½		3	3		2 ¾	2 ½		2	1 ¾		1 ¾
			Ave. Web Th. (w)	11		10	9 ½		8	7		6 ¼	4		4
			Slab Th. (t)	6 ¾	7	5 ½	5 ¾	6	4 ¾	4 ¾	5	3 ¾	3 ¼	3 ½	2 ¾



Row No.	Structural Components	Insulating Material	Description	4 Hour			3 Hour			2 Hour			1 Hour		
				I & II		III	I & II		III	I & II		III	I & II		III
8.	Single Tee	Concrete Type I, II & III a b c d e k	Ave. Cover	2 ¾		2 ¾	1 ¾		1 ¾	1 ¾		1 ¾	1 ¾		1 ¾
			Ave. Web Th. (w)	8		8	8		8	8		8	4		4
			Top Thick's (t)	6 ¾	7	5 ½	5 ¾	6	4 ¾	4 ¾	5	3 ¾	3 ¼	3 ½	2 ¾



Row No.	Structural Components	Insulating Material	Description	4 Hour		3 Hour		2 Hour		1 Hour	
				I & II	III	I & II	III	I & II	III	I & II	III
9.	Multi-Tee Units	Concrete Type I, II & III a b c d e k	Ave. Cover	By Test or Listing by Approved Testing Laboratory				2	1 ¾	1 ¾ 1 ½	1 ½
			Ave. Web Th. (w)					4	4	4 2 ½ 2 ½	2 ½
			Top Thick's (t)					4 ¾	5	3 ¾ 3 ¼ 3 ½	2 ¾



Row No.	Structural Components	Insulating Material	Description	4 Hour			3 Hour			2 Hour			1 Hour		
				I & II		III	I & II		III	I & II		III	I & II		III
10.	Solid and Cored Slabs	Concrete Type I, II & III a b c d e h k	t_1 or t_2	6 ¾	7	5 ½	5 ¾	6	4	4 ¾	5	3 ¾	3 ¼	3 ½	2 ¾
			Ave. Cover	2 ½		2 ¼	2		1 ¾	1 ¾		1 ½	1		1

Table 2 (continued)

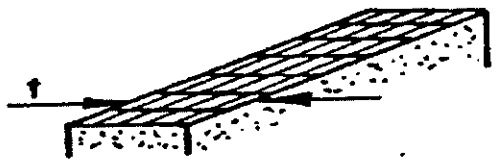
Components Without Applied Protection— MASONRY BEARING AND NONBEARING														
Row No.	Structural Components	Insulating Material	Description	Sketch & Minimum Requirements										
														
11.	Unreinforced Concrete Walls and Partitions	Concrete Type I, II & III a m		4 Hour			3 Hour			2 Hour			1 Hour	
				I	II	III	I	II	III	I	II	III	I	II	III
			Wall Th. (t)	6	6 ½	5	5	5 ½	4 ½	4	4 ½	4	3	3	3
														
12.	Hollow Masonry Walls and Partitions—Block Tile, Cored Bricks, Cavity Walls	Coarse Aggregate g m		4 Hour			3 Hour			2 Hour			1 Hour	
		Expanded Slag	Equiv. Thick's r	4.7			4.0			3.2			2.1	
		Expanded Clay, Shale or Slate	Equiv. Thick's r	5.1			4.4			3.6			2.6	
		Limestone, Cinders, Unexpanded Slag	Equiv. Thick's r	5.9			5.0			4.0			2.7	
		Calcareous or Siliceous Gravel	Equiv. Thick's r	6.2			5.3			4.2			2.8	
														
13.	Solid Masonry Brick Block—Clay Tile with Less than 25% Voices or with the Cores Filled	Masonry Clay, Shale, Concrete, Sand or Lime m	Wall Th. (t)	4 Hour			3 Hour			2 Hour			1 Hour	
				10"			8"			6"			4"	

Table 2 (continued)

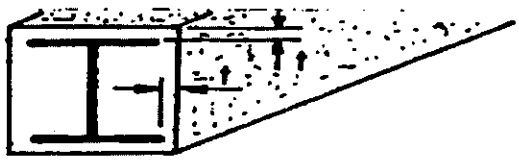
Components With Direct Applied Protection—STEEL																
Row No.	Structural Components	Insulating Material	Description	Sketch & Minimum Requirements												
																
				4 Hour			3 Hour			2 Hour			1 Hour		
				I	II	III	I	II	III	I	II	III	I	II	III
14.	Columns	Concrete Type I, II & III a p	Thickness of Protection (t)	2	2 ½		1 ½	2		1	1 ½		1	1	
		Solid Masonry i	Thickness of Protection (t)	3 ¾	3 ¾		3 ¾	3 ¾		2 ¼	2 ¼		2 ¼	2 ¼	
																
				4 Hour			3 Hour			2 Hour			1 Hour		
				I	II	III	I	II	III	I	II	III	I	II	III
15.	Girders… Beams… Trusses	Concrete Type I, II & III a p	Thickness of Protection (t)	2	2 ½		1 ½	2		1	1 ½		1	1	
																
				4 Hour			3 Hour			2 Hour			1 Hour		
16.	Columns… Beams… Girders… Trusses…Joists and Steel Floor Units	Sprayed Fiber…Cementitious Mixture…Intumescent Paints		By Tests…or Listing by Approved Testing Laboratory												

Table 2 (continued)

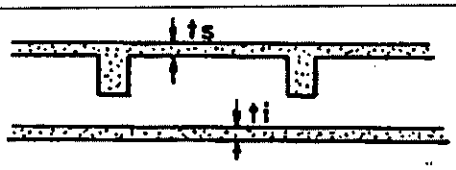
Components With Suspended or Attached Protection—CONCRETE							
Row No.	Structural Components	Insulating Material	Description	Sketch & Minimum Requirements			
							
				4 Hour	3 Hour	2 Hour	1 Hour
17.	Concrete Joists or Waffle	Concrete Type I, II or III ¾" cover a c d	t_s Slab Thickness	3"	2"		
		Vermiculite…gypsum …or perlite gypsum on metal lath	t_i Insulation Thickness	1"	¾"		

Table 2 (continued)

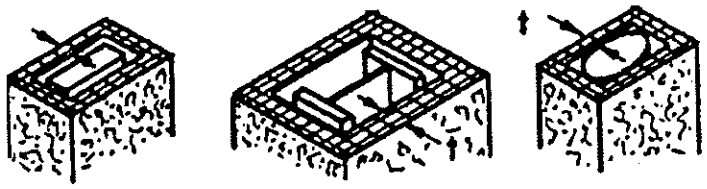
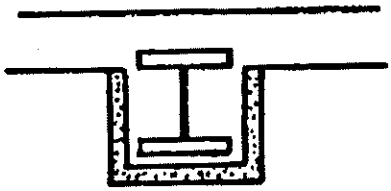
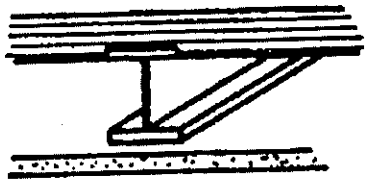
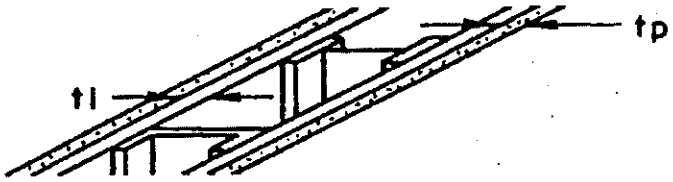
Components With Suspended or Attached Protection— STEEL FRAMING							
Row No.	Structural Components	Insulating Material	Description	Sketch & Minimum Requirements			
							
				4 Hour	3 Hour	2 Hour	1 Hour
18.	Steel Columns	Type I & II Masonry 1 ½" air space j	t Insulation Thickness	4" solid			
							
				4 Hour	3 Hour	2 Hour	1 Hour
19.	Steel Girders... Beams... Trusses... Joists, Columns Individually Protected	Sprayed Fibre...Cementitious Mixture...Lath & Plaster		By Tests...or Listing by Approved Testing Lab			
							
				4 Hour	3 Hour	2 Hour	1 Hour
20.	Steel Beams, Girders, Trusses and Joists...with Ceiling Protection and Minimum 2 ½ Th. Type I, II or III Concrete Slab a c d	Sprayed Fibre...Cementitious Mixture...Lath & Plaster Acoustical Tile		By Tests...or Listing by Approved Testing Lab			
							
				4 Hour	3 Hour	2 Hour	1 Hour
21.	Steel Stud Partition Nonbearing, Min. 2 ½" Stud	Gypsum...Perlite Plaster on Perforated Gyp. Lath	t_p Plaster t_l Lath			¾" 3/8"	½" 3/8"
		Gypsum Wall Board g	No. Layers Thick. Each			Two 5/8"	One 5/8"

Table 2 (continued)

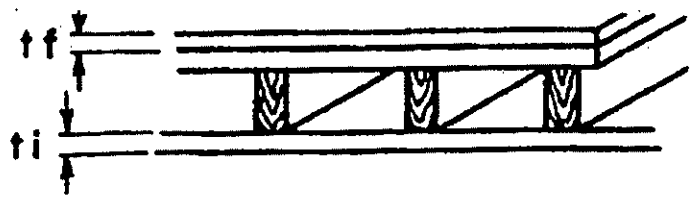
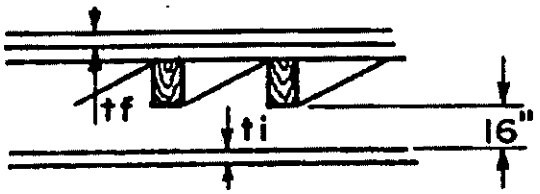
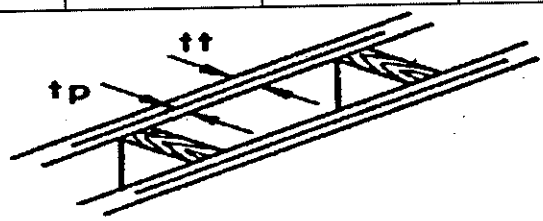
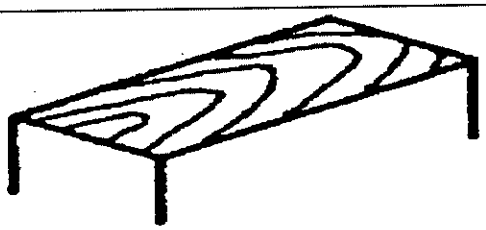
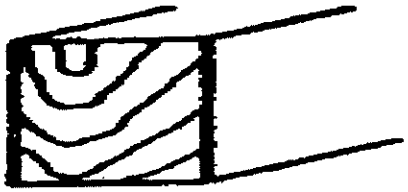
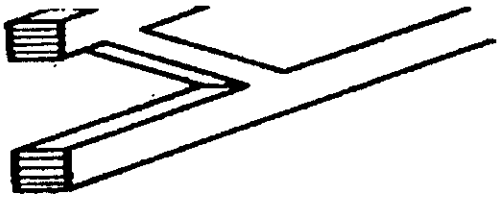
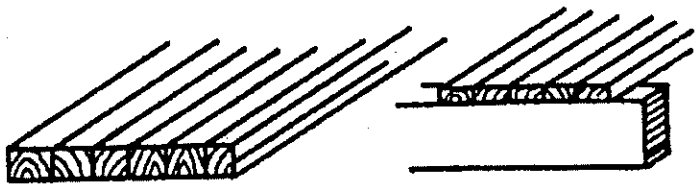
Components With Suspended or Attached Protection— COMBUSTIBLE CONSTRUCTION							
Row No.	Structural Components	Insulating Material	Description	Sketch & Minimum Requirements			
							
				4 Hour	3 Hour	2 Hour	1 Hour
22.	Wood Joists Min. 2" x 10", Wood Floor Attached Ceiling g	Gypsum Wallbrd Below 2" x 10"s Max. 24" o/c	t_i Wallbrd Thickness				5/8"
		½" Plywood or 1" x 6" T&G Sub-Flrg	t_f Flooring				5/8" Plywood or Nom. 1" x 3" T&G
							
				4 Hour	3 Hour	2 Hour	1 Hour
23.	Wood Joists Min. 2" x 10", Wood Floor Suspended Ceiling	Noncombustible Acoustical Tile Below 2" x 10"s 16" o/c	t_i Insulation				5/8"
		5/8" Plywood or Nom. 1" x 4" T&G Sub-Flrg	t_f Flooring				½" Plywood or Nom. 1" x 6" T&G
							
				4 Hour	3 Hour	2 Hour	1 Hour
24.	Wood Stud Partition Min. 2" x 4" Stud	Gypsum Wallboard g	No. Layers/Th. of Each			Two 5/8"	Two 3/8" or One 5/8"
		Gypsum Perlite Plaster on 3/8" Gypsum Lath	t_p			1" plas. w/1" hex. mash	9/16" plaster
		Gypsum & Sand Plaster on U.L. Listed Wire Lath	t_t				¾" plaster
		Gypsum & Vermiculite Plaster on Metal Lath	t_t				¾" plaster

Table 2 (continued)
Heavy Timber Construction Table

HEAVY TIMBER SOLID OR LAMINATED							
Row No.	Structural Components	Insulating Material	Description	Sketch & Minimum Requirements			
							
				4 Hour	**3 Hour**	**2 Hour**	**1 Hour**
25.	Columns	Wood All Species	Floor… Width x Depth Min. Nom.				8" x 8"
			Roof… Width x Depth Min. Nom.				6" x 8"
							
				4 Hour	**3 Hour**	**2 Hour**	**1 Hour**
26.	Girders and Beams	Wood All Species	Min. Width x Depth (Nom.)				6" x 10"
							
				4 Hour	**3 Hour**	**2 Hour**	**1 Hour**
27.	Arch and Truss for Roof Only	Wood All Species	Min. Width x Depth Each Member				4" x 6"
							
				4 Hour	**3 Hour**	**2 Hour**	**1 Hour**
28.	Floor and Roof Deck	Wood All Species	Roof				2" Nom. T&G or 3" Solid
			Floor				3" Nom. T&G + 1" nom. T&G or 4" Solid

COMM 51.046 CALCULATION METHOD.

(1) The rational design of structural members for fire resistance shall be submitted to the department and shall be based on the type of span (simple or restrained), the magnitude of longitudinal restraint, accepted structural engineering principles and methods.

(2) Appropriate research data and design criteria to substantiate the method, interpreting between known information, shall accompany the above material and shall include:

(a) Time—temperature relationship ASTM E-119.

(b) The temperature—strength characteristics of the structural components.

(c) The time—temperature characteristics of the insulating material, temperature range designated by ASTM E-119.

(d) The expansion characteristics of the materials comprising the member, at the temperature range designated by ASTM E-119.

Note: For ASTM E 119 standard adopted see s. COMM 51.25 (4) Table 51.25-10. The department will accept published research data from the Portland Cement Association, the American Iron & Steel Institute, and the American Institute of Steel Construction, Inc.

(e) The safety factor of not less than 1.0 shall be maintained at the end of the time requirement for the full design live load and dead load.

COMM 51.047 FIRE-RATED DOOR ASSEMBLIES IN FIRE-RATED CONSTRUCTION.

(1) FIRE-RESISTIVE RATED DOOR ASSEMBLIES.

(a) 1. Except as provided in subds. 2. and 3., an opening where permitted in a fire-resistive rated wall or wall assembly shall be protected by means of a fire-resistive rated door assembly which conforms to ATSM E-152.

Openings in fire-rated wall assemblies required for isolation or separation purposes must be protected by appropriately rated fire door assemblies. If the wall is rated for COMM 51.03 structural purposes only, and the rated wall does not serve to contain smoke or fire, the opening protection is not required. The same rationale applies to horizontal assemblies except floor/ceiling ratings required for class of construction ***do*** *serve as smoke/fire containment elements as well as structural. Therefore, openings in such floor systems require protection unless specifically exempted by other code sections. Where openings are allowed to be unprotected, remember to provide the appropriate assembly or blocking at the edge of the opening to protect the structural elements for fire resistance. Also, see s. COMM 51.042 commentary for discussion on fixtures allowed in assemblies.*

Openings in fire-rated construction under the roof of a supported canopy must be protected by appropriately rated fire door or window assemblies.

A fire door assembly consists of a listed door, listed frame and listed hardware. All three must be present to constitute a complying fire door assembly. Fire door assemblies may not be field modified except as permitted by the testing laboratory responsible for the label. Owners wishing to modify a fire door assembly, typically to install lights or louvers, must receive written permission from the testing laboratory. Occasionally such permission is included as instructions supplied with the door assembly at time of delivery.

Unless specifically exempted by the occupancy chapters of the code, all fire door assemblies, including those with a 20-minute rating, must be provided with door closing devices.

Question: *In fire-rated construction, where openings must be protected by fire door/window assemblies, must such openings be protected when they face exterior, open canopies?*

Answer: *Canopies are either cantilevered or supported.*

In application of COMM 51.01 (4) Area, we consider that anything within the outside surface of the building walls or supports as being inside the building. Therefore, openings in walls leading to a supported canopy are interior doors. As the codes with respect to fire wall opening protection are intended to separate portions of the interior of a building, and as area under the support canopy is part of the interior, the openings in such walls must have protection.

Therefore, openings in fire-rated construction which open under the roof of a supported canopy must be protected by appropriately rated fire door or window assemblies.

Question: *Are water curtain/deluge systems equivalent protection for openings in fire-rated assemblies?*

Answer: *No, several petitions for variance have been granted, however, research has indicated that these do not provide an equivalency for more than 1-hour. Petition submitters are advised that previous precedent petitions allowing water curtain/deluge systems in lieu of 3-hour opening protections will no longer be utilized as precedents for satisfying the code intent. Future petitions must establish equivalency to the intent of providing the level of safety desired by incorporating such things as reducing the hazards or providing opening protection in addition to the water curtain/deluge system, etc.*

Note: When water systems are allowed to be utilized to protect openings in firewalls, the ***deluge system****, as per NFPA 13:3-3.3, is usually more appropriate than the NFPA 13:4-4.1.7.3.4 water curtain.*

The deluge system is a system employing open sprinklers attached to a piping system connected to a water supply through a valve that is opened by the operation of a fire detection system installed in the same areas as the sprinklers. When this valve opens, water flows into the piping system and discharges from all sprinklers attached thereto.

Note: COMM 51.047 (1)(a) 2. allows directed nozzles installed in accordance with NFPA 15 to be utilized for the protection of conveyor openings in fire rated walls.

2. An opening accommodating a conveyer system in a fire-resistive rated wall or wall assembly may be protected by means of directed nozzles in a water spray system which is designed and installed in accordance with NFPA 15 and which is provided on both sides of the opening, in lieu of a fire-resistive rated door assembly. This opening shall be no larger than needed to accommodate the conveyor and the material being conveyed.

3. Where the fire-resistive assembly is being used to provide only the protection required as a structural building element, as specified in line 17 of Table 51.03-A, and is not also used for separation purposes, the opening need not be protected in accordance with subd. 1. if the opening is effectively fire stopped to ensure that the fire-resistive integrity of the structural element will not be reduced.

(b) The type of fire-resistive rated door assembly shall be provided in accordance with Table 51.047.

TABLE 51.047
MINIMUM FIRE-RESISTIVE RATINGS OF DOOR ASSEMBLIES

Fire-Resistive Rating of a Wall or Wall Assembly	Fire-Resisitve Rating of Door Assembly[1]
4-hour	3-hour A
3-hour	3-hour A
2-hour	1 1/2-hour B
1-hour	3/4-hour C

Footnote to Table 51.047

[1] The letter A, B or C following the hourly rating designates the location for which the assembly is designed, which is intended to agree with NFPA Standard 80. Compliance with the hourly rating is required regardless of the letter designation.

(2) LABELS. Fire-rated door assemblies shall be labeled with a permanent label, securely attached and located to permit visual inspection after installation. The label shall identify the time rating, testing laboratory, listing agency and manufacturer.

A "listing agency" is typically an independent, unbiased agency competent in the testing and evaluation of test data pertinent to the product being listed and who publishes a listing of those products they have authorized to be labeled. The listing agency is also responsible for periodic inspection of the product to verify it is representative of the product tested and listed.

(a) Labeled fire-door assemblies shall not be modified without written acceptance from the testing laboratory.

(3) INSTALLATION OF FIRE-RATED DOORS. The fire-rated door assemblies shall be installed with frame, hinges, latches, closing devices and counterweights in accordance with methods and standards approved by the department. Adequate clearance shall be maintained to permit free operation of fire-rated doors.

Question: *When is carpeting permitted to be continuous underneath a fire door?*

When is a sill required for a fire door?

Answer: *COMM 51.047 (3) Note 1 references NFPA Standard 80 for installation of fire doors and windows.*

The 20-minute or 30-minute rated doors would not require any sill. The 45-minute doors would require a sill to be provided if combustible floor framing extends through the door opening.

Combustible floor covering of a Class II interior floor finish rating may extend through rated door openings up to 1 1/2 hours.

In all conditions, a sill shall be provided in a 3-hour rated door assembly and carpet shall not extend through the 3-hour assembly.

Note 1: The department will accept recommended practices for installation covered in "Standard for Fire Doors and Windows," NFPA No. 80.

As in the case of all fire-resistive assemblies, doors, windows, and penetration systems, these systems must be properly maintained. In the case of fire doors, periodic testing may be necessary to assure they are being maintained operational.

Note 2: See s. COMM 51.15 for exit door requirements.

(4) SECURING DOOR FRAMES. Methods of securing door frames to adjacent construction shall be illustrated on the plans submitted to the department for review.

(5) DOOR CLEARANCES. The maximum swinging-door clearances to frame shall be 1/8 inch on sides and top and 3/4 inch at bottom between sill or floor.

(6) DOOR CLOSING DEVICES. All labeled fire-rated doors, where required, shall be equipped with an approved automatic or self-closing device as defined in s. COMM 51.01 (17).

(a) All doors serving smokeproof towers or interior enclosed stairways shall be equipped with a self-closing device or an automatic closing device actuated by products of combustion other than heat.

(b) The requirements of sub. (6) (a) shall also be retroactive to existing buildings.

(c) Doors provided with a self-closing device shall remain in a closed position.

Note: The intent of this rule is to accept normal usage of the door, but not permit doors with this closing device to be blocked open at any time.

(d) Where a pilot weight is used, it shall be suspended from a chain or wire cable, and shall be installed in a protective housing.

Note: For specific types of closing devices permitted, please refer to the sections dealing with classes of construction and/or the occupancy chapters.

***Question**: Where must fire rated doors have self-closing devices rather than automatic closing devices.*

***Answer:** The difference between an automatic closing device and a self-closing device as defined in COMM 51.01 (17) is that a self-closing device maintains the door in a closed, latched position, thus acts as a protection against rapidly developing fire and smoke hazards. The following code sections require the use of self-closing fire doors. These doors may not be equipped with hold-open devices and must be kept closed.*

COMM Table 51.08 Footnote m - CBRF - Garage Separation

COMM Table 51.08-2 All doorway openings in hazard isolations.

COMM 57.06 (2) - Protection of openings into corridors.

In other instances, the fire doors are allowed to have either self-closing OR automatic closing devices, possibly with additional restrictions. For instance, automatic closers may be utilized in the following instances only if they are activated by products of combustion other than heat.

COMM 51.047 (6)(a) - Smokeproof towers and enclosed stairways

COMM 52.07 (6)(a) 2. - Atriums

COMM 51.19 (2)(c) - Horizontal exits

Designers are also advised to consult COMM 10 (which further adopts NFPA 30 and 80) when designing a facility for flammable and/or combustible liquids.

COMM 51.048 FIRE WINDOW AND GLASS BLOCK ASSEMBLIES IN FIRE-RATED CONSTRUCTION.

(1) (a) *Window openings.* Except as provided in par. (b), window openings, where permitted in fire-rated walls, shall be protected with fire window or glass block assemblies rated as 3/4-hour by an approved laboratory and tested in accordance with standard method ASTM E-162.

(b) Where the fire-resistive assembly is being used to provide only the protection required as a structural building element, as specified in lines 17 of Table 51.03-A, and is not also used for separation purposes, the opening need not be protected in accordance with par. (a) if the opening is effectively fire stopped to ensure that the fire-resistive integrity of the structural element will not be reduced.

(2) SIZE.

(a) *Fire window assemblies.* The sizes and dimensions of the glazing materials and the frames may not exceed their respective listing. Windows combined in multiple assemblies shall be separated by approved nonbearing metal mullions.

(b) *Glass block assemblies.* Openings for glass block assemblies shall not exceed 120 square feet in area. The width or height of the opening shall not exceed 12 feet.

(3) MATERIALS AND INSTALLATION.

(a) *Frames.* Approved metal frames shall be securely fastened to the construction and be capable of resisting all wind stresses and other stresses to which they are likely to be subjected.

(b) *Wired glass.* The wired glass shall be labeled wired glass, 1/4-inch thick, and shall be well bedded in approved glazing compound. All exposed joints between the metal shall be struck and pointed. The clearance between the edges of the glass and metal framing shall not exceed 1/8 inch.

(c) *Glass block.* Glass block assemblies shall be installed according to the details of the tested assembly.

Note: The department will accept recommended practices for installation covered in "Standard for Fire Doors and Windows," NFPA No. 80.

(d) *Approved glass.* Glass for a fire window application shall conform to the conditions and limitations of its listing.

(4) LABELS. Fire window assemblies shall be labeled with a permanent label, securely attached and located to permit visual inspection after installation. The label shall identify the time rating, testing laboratory, listing agency and manufacturer. Glass block shall be listed by an approved laboratory.

51.049 MISCELLANEOUS PENETRATIONS IN FIRE-RESISTIVE CONSTRUCTION.

(1) GENERAL.

(a) Except as specified in pars. (c) and (d), penetrations into or through fire-resistive assemblies, fire protective membranes, thermal barriers, or construction providing a finish rating as an alternative to a fire resistive assembly shall be protected in accordance with this section.

(b) Where an approved fire-stop system is used, the system shall be tested and listed for the specific application regarding the size of the opening, the size and type of the penetrating objects, the type of assembly penetrated, and the size of the annular space to be fire stopped.

(c) Where tested and listed fire resistive assemblies under s. Comm 51.044 are being used and the listing provisions regarding membrane penetrations are in conflict with this section, the provisions of the tested and listed assembly shall govern.

(d) Where the fire-resistive assembly is being used to provide only the protection required as a structural building element, as specified in lines 1 through 17, 21 and 22 of Table 51.03-A,

is not also used for separation purposes and is a through penetration, the opening need not be protected in accordance with par. (a) if the opening is effectively fire stopped to ensure that the fire-resistive integrity of the structural element will not be reduced.

(2) DUCT OPENINGS. The annular space around the outside of a duct that penetrates into or through fire-resistive construction, as described in sub. (1)(a), shall be protected in accordance with one of the following:

(a) The recommendations of the manufacturer of the fire damper or the fire curtain door, when the duct is provided with a fire damper or fire curtain door at the penetration.

(b) An approved fire-stop system having an F-rating not less than the hourly rating of the assembly being penetrated.

(c) Grout, concrete or mortar for the full depth of the penetrated assembly when the assembly is constructed of concrete or masonry.

Note: See s. COMM 64.42 for fire damper and fire curtain door requirements.

(3) NONCOMBUSTIBLE PENETRATING ITEMS.

(a) *Through-penetrations.* Through-penetrations of fire-resistive assemblies by noncombustible wiring items or noncombustible piping items, excluding glass piping, shall be in accordance with this subsection.

(b) *Openings of 100 square inches or less.* Where the area of an opening is 100 square inches or less and the total aggregate area of all such openings does not exceed 100 square inches in any 100 square feet of surface area being penetrated, the annular space around the penetrating item shall be protected in accordance with one of the following:

1. Closed with an approved fire-stop system having an F-rating not less than the hourly rating of the assembly being penetrated.
2. Filled to the full depth of the penetrated assembly with grout, concrete, or mortar, when the assembly is constructed of concrete or masonry.

(c) *Openings larger than 100 square inches.*

1. Wall assemblies. Where a wall assembly opening is larger than 100 square inches or the total aggregate area of all such openings exceeds 100 square inches in any 100 square feet of wall surface area, the annular space around the penetrating item shall be closed with an approved fire-stop system having an F-rating not less than the hourly rating of the assembly being penetrated.
2. Floor assemblies. Where a floor assembly opening is larger than 100 square inches or the total aggregate area of all such openings exceeds 100 square inches in any 100 square feet of surface area and the openings are not contained within a wall or column at the point the floor is penetrated, the annular space around the penetrating item shall be closed with an approved fire-stop system having an F- rating not less than the hourly rating of the assembly being penetrated.

(4) COMBUSTIBLE PENETRATING ITEMS. Through-penetrations of fire-resistive assemblies by combustible piping items, glass piping, or combustible wiring items shall be protected with an approved fire-stop system having an F-rating not less than the hourly rating of the assembly being penetrated.

(5) MEMBRANE PENETRATIONS.

(a) *Openings around objects.*

1. Except as provided in subds. 2. to 4., the annular space of a membrane penetration into a fire-resistive assembly, or through a fire-protective membrane, a thermal barrier, or construction providing a finish rating as an alternative to a fire resistive assembly, shall be protected in the same manner as that provided for the membrane of a through-penetration of a similar assembly under sub. (2), (3), or (4).

2. The annular space of a membrane penetration that occurs around electrical outlet and switch boxes that are listed by an approved testing laboratory as either "outlet boxes and fittings classified for fire resistance" or "metallic outlet boxes" is not required to be protected in accordance with subd. 1., if the width of the space is 1/8 inch or less.

3. The annular space of a membrane penetration that occurs around a fire sprinkler and which is provided with a metal escutcheon plate is not required to be protected in accordance with subd. 1.

4. Membrane penetrations by electrical outlet and switch boxes that are listed by an approved testing laboratory as "outlet boxes and fittings classified for fire resistance" shall be used subject to the requirements and limitations of the listing.

(b) *Metallic outlet boxes.* The membrane penetration of vertical fire-resistive construction having a rating of 2 hours or less, including a fire-resistive wall assembly, a fire-protective membrane, a thermal barrier, or construction providing a finish rating as an alternative to a fire resistive assembly, that is created by electrical outlet and switch boxes that are listed by an approved testing laboratory as "metallic outlet boxes," shall be subject to all of the following:

1. The surface area of an individual box may not exceed 16 square inches.

2. The aggregate surface area of the boxes may not exceed 100 square inches per 100 square feet of wall surface.

3. Boxes shall not be installed on opposites sides of walls or partitions of staggered stud construction unless tested and listed for use in staggered stud construction by an approved testing laboratory.

4. Where boxes are located on opposite sides of a non-staggered stud wall or partition, the boxes shall be separated by a minimum horizontal distance of 24 inches, unless installed in accordance with all of the following:

   a. The boxes shall be protected by a wall opening protective material that is listed for the use by an approved testing laboratory.

   b. The wall opening protective material shall be installed in accordance with the requirements and limitation of the listing.

This section sets forth the methods to protect such penetrations. Design professionals should be informing contractors and subcontractors as to the location of fire rated assemblies and the appropriate method of penetrating those assemblies. Examples of acceptable through penetration firestops may be found in the UL Fire Resistance Directory, Volume II.

***HVAC Vent Pipes**: Penetration of fire rated assemblies by direct vent sealed combustion appliance piping must be protected by one of the above methods and may not violate the manufacturer's listing.*

***Assemblies:** Penetrations shown and described in listed building assemblies may be installed in the assembly without any additional penetration protection.*

***Substitution:** The department will accept substitution of combustible penetrating materials with non-combustible material and consider it a non-combustible penetration if the substitution is for a minimum of 10 feet from the penetrated assembly.*

Recessed "can" lights: Based on equivalent rated assemblies, the department will accept up to 4 recessed can lights, per 100 square feet, without penetration protection, in living unit separations, not otherwise required to be rated per other code requirements.

COMM 51.05 ROOF COVERINGS.

Roof coverings of class A, B, C or unclassified shall be provided as specified under "Classes of Construction" s. COMM 51.03 (1) to (8) or under the specific occupancy requirements of chs. COMM 54 to 62.

Roof coverings are evaluated utilizing ASTM E 108 from an external fire source and are either classified as Class A, B or C ("A" being able to withstand a severe fire exposure and "C" being able to withstand a light fire exposure).

Common in the building industry is the use of the single ply roof membranes. Most of these types of roof coverings achieve the E 108 classification with the use of stone covering over the membrane. The membrane itself is combustible and will be consumed when subjected to fire, therefore, the stone covering is a necessity. Single ply roof covering cannot replace the built-up multi-ply roof covering specified in most hourly rated roof ceiling assemblies unless specifically mentioned in the test listing.

Note: Brick, concrete, tile, slate, and ferrous, and cupreous and other metals and their alloys will be accepted as "Class A" roof coverings.

COMM 51.06 FOAM PLASTICS.

(1) SCOPE. The requirements of this section shall apply to the use of foam plastics in building construction.

All foam plastic (urethane, polystyrene, isocyanurate, urea formaldehyde and others not as common) cannot be used so that they are exposed to the room (or occupied) side of buildings so as to present an undue fire hazard. If exposed to fire, foam plastics can flash over with extreme rapidity and release large amounts of thick-dense, toxic smoke, also very rapidly. Therefore, any foam plastic product used in other than the methods prescribed by (3)(b) should have elaborate and in-depth fire testing to properly evaluate the product in other than the protected condition cited by the code.

If a foam product meets the flame spread and smoke developed criteria and is installed in one of the methods specified, it can be used where noncombustible construction is required by the code.

(2) FLAME SPREAD AND SMOKE DEVELOPED CRITERIA. Except as otherwise provided, all foam plastic and foam plastic cores in manufactured assemblies used in building construction, shall have a flame spread rating of not more than 75 and a smoke developed rating of not more than 450 when tested in the maximum thickness intended for use in accordance with ASTM E84.

(3) THERMAL BARRIER.

(a) Except as provided in subs. (4) to (7), foam plastics shall be separated from the interior of a building by an approved thermal barrier of 1/2 inch gypsum wallboard or equivalent thermal barrier material which will limit the average temperature rise of its unexposed surface to not more than 250°F. after 15 minutes of fire exposure as specified in the ASTM E119 standard

time temperature curve or the equivalent using the Small Scale Horizontal Exposure Furnace, with samples for the test having a minimum length and width of 3 feet by 3 feet.

A thermal barrier is installed to protect the combustible material (i.e., foam plastic) from the temperature rise associated with a developing fire. In numbers, a thermal barrier is to prevent a temperature rise of 250°F. over ambient temperature on the nonfire side of the protective material for a time period of 15 minutes. The protective material is subjected to the standard time-temperature relationship established by ASTM E 119 fire test.

The 15-minute time period is desired since this time is associated with a typical fire identification time in an occupied building and is also associated with the typical response time of fire departments to arrive at the scene of a fire and start the extinguishing process.

(b) The thermal barrier shall be installed in such a manner that it will remain in place for at least 15 minutes based upon approved diversified tests.

The basic requirement is to provide a thermal barrier between the foam plastic and the building interior. The purpose of the remaining provisions of COMM 51.06 is to allow omission of the thermal barrier if specific criteria is satisfied for the listed specific applications.

(4) EXTERIOR APPLICATIONS. The following requirements shall apply to all exterior uses of foam plastics unless specifically approved as specified in sub. (7):

(a) *Masonry or concrete components.* Foam plastics may be used without the thermal barrier specified in sub. (3) regardless of the class of construction, when the foam plastic is protected by a minimum of one inch thickness of masonry or concrete in a wall or floor system;

(b) *Noncombustible hourly rated and combustible hourly rated construction.* Foam plastics may be used within the cavity or as an element of a noncombustible hourly rated or combustible hourly rated system or assembly provided:

1. The system or assembly meets the requirements of s. COMM 51.04 for time-rated construction;

2. a. Except as provided in subpar. b., a thermal barrier as specified in sub. (3) is provided;

b. The thermal barrier may be omitted for exterior walls provided that the foam plastic insulation does not exceed 4 inches in thickness, has a flame spread rating of 25 or less, and is covered by a thickness of not less than 0.032 inch aluminum or corrosion-resistant sheet steel having a base metal thickness of 0.016 inches and the wall height does not exceed 50 feet and the entire building or that portion of the building closed by the walls is protected with an automatic fire sprinkler system; and

3. a. Except as provided in subpar. b., the exterior side of the assembly or system is covered with a cladding material meeting the requirements for noncombustible construction, and the wall assembly shall not propagate flame over the surface or through the core when subjected to a full scale test with the assembly in its end use condition or when subjected to an approved diversified test;

b. The exterior coating, facing or cladding material for walls may be of other than noncombustible material provided that the foam plastic core, coating, facing and cladding, each when tested individually shall have a flame spread of 25 or less and a smoke developed rating of 450 or less when tested in accordance with ASTM E84; facing, coating, cladding and core material shall be fastened to each other to prohibit

failure in bond as a result of temperature which may be experienced in a building fire, or from winds or other conditions; and the wall assembly shall not propagate flame over the surface or through the core when subjected to a full scale test with the assembly in its end use condition or when subjected to an approved diversified test.

(c) *Noncombustible 0-hour (NC-0) rated construction.* Foam plastics may be used within the cavity or as an element of noncombustible 0-hour (NC-0) rated construction provided the following conditions are satisfied:

1. The foam plastic core material has a flame spread of 25 or less and a smoke developed rating of 450 or less when tested in accordance with ASTM E 84;

2. a. Except as provided in subpar. b., a thermal barrier as specified in sub. (3) is provided;

b. The thermal barrier may be omitted for exterior walls provided that the foam plastic insulation does not exceed 4 inches in thickness, and is covered by a thickness of not less than 0.032 inch aluminum or corrosion-resistant sheet steel having a base metal thickness of 0.016 inches and the wall height does not exceed 50 feet and the entire building or that portion of the building enclosed by the walls is protected with an automatic fire sprinkler system; and

3. a. The exterior side of the assembly or system is covered with a cladding material meeting the requirements for noncombustible construction as specified in s. COMM 51.01 (86);

b. The exterior coating, facing or cladding material for walls may be of other than noncombustible material provided that the coating, facing and cladding, shall have a flame spread of 25 or less and a smoke developed rating of 450 or less when tested in accordance with ASTM E 84;

c. The facing, coating, cladding and core material shall be fastened to each other to prohibit failure in bond as a result of temperature which may be experienced in a building fire, or from winds or other conditions; and

d. The wall assembly shall not propagate flame over the surface or through the core when subjected to a full scale test with the assembly in its end use condition or when subjected to an approved diversified test.

Note: Light-transmitting plastic veneer or combustible veneer materials conforming to the requirements of this paragraph need not meet the height and area limitations for light-transmitting plastics (see s. COMM 51.065).

(d) *Combustible nonrated construction.* Foam plastic insulation may be used within the cavity or as an element of combustible nonrated construction (0) provided the following conditions are satisfied:

1. The distance to a property line or other building on the same property meets the requirements of Table 51.03-A;

2. Thermal barriers as specified in sub. (3) are provided; and

3. The exterior side of the assembly or system is covered with a cladding material meeting the requirements for combustible construction as specified in Table 51.03-A.

(e) *Roofing.* Foam plastic may be used as part of a Class A, B or C or unclassed roof covering as specified in s. COMM 51.05. The foam plastic:

1. Shall not be limited as to smoke development rating;

2. May not be limited as to flame spread rating if it is a component of a factory-made composite insulation or assembly and the roof system complies with the calorimeter requirements of FM 4450 or UL 1256;

3. May be installed without a protective thermal barrier if the foam plastic has a flame spread rating of 75 or less when tested at the maximum thickness intended for use and the roof system complies with the calorimeter requirements of FM 4450 or UL 1256; and

4. May be installed without a protective thermal barrier if the foam plastic has a flame spread rating of 75 or less when tested at the maximum thickness intended for use and the foam plastic is separated from the building interior by a minimum of one inch thickness of masonry or concrete or a minimum of 1/2 inch thickness plywood bonded with exterior glue and properly edge supported, or equivalent.

One-half inch non-veneer APA (American Plywood Association) rated sheathing panels meeting APA specification PRP-108, commonly referred to as oriented strand board (OSB), may be used in lieu of "plywood." The use of "and" between 3. and 4. above is intended to allow each of the subd. 1. - 4. to stand on its own. Thus, both 3. and 4. do not have to be satisfied simultaneously.

Notwithstanding the exceptions indicated in these sections, foam plastic may not be used in a pedestrian access structure connecting buildings as described in subch. VII of COMM 62.

(5) OTHER APPLICATIONS.

(a) *Interior construction.* Foam plastic may be used as an element of or attached to interior construction components, including walls, partitions, floor/ceiling assemblies and similar components that divide interior spaces within the building, as follows:

1. Within the cavity or as an element of a noncombustible hourly rated or combustible hourly rated system or assembly provided the system or assembly meets the requirements of s. COMM 51.04 for time-rated construction for at least one hour with a fire exposure on both sides of the system or assembly; or

2. Within the cavity or as an element of noncombustible 0-hour (NC-0) rated construction or combustible nonrated construction (0) provided the foam plastic is protected on both sides by a thermal barrier as specified in sub. (3).

(b) *Attics and crawlspaces.*

1. Attics may be insulated with unprotected foam plastic provided the ceiling between the attic and the occupied space is covered by 1/2 inch gypsum wallboard or equivalent and the attic space is not used for storage or air handling purposes.

2. Crawlspace walls may be insulated with unprotected foam plastic provided the floor between the crawlspace and the occupied space consists of at least 3/4 inch tongue and groove plywood sheathing or equivalent, and the crawlspace is not used for storage or air handling purposes.

3. Foam plastic shall be protected by a thermal barrier as specified in sub. (3) when the foam plastic is installed in an attic or crawlspace and the area is used for storage or air handling purposes.

(c) *Doors and shutters.*

1. a. Except as provided in subpar. b., where doors and shutters are permitted without a fire-resistive rating, foam plastic having a flame spread rating of 75 or less may be used as a core material when the facing is metal having a minimum thickness of 0.032 inch aluminum or sheet steel having a minimum thickness of 0.0160 inch.

b. Foam plastic core sectional overhead doors covered by at least 1/8 inch thick hardboard may be used wherever nonrated combustible doors are permitted.

2. A thermal barrier is not required for doors and shutters meeting the requirements specified in subd. 1.

Caution: Many manufacturers of residential type garage doors do not provide the required thermal barrier on standard doors. Be sure to order the optional feature to obtain a code-complying door.

(d) *Siding backer board.* Foam plastic not more than 1/2 inch thick may be used as siding backer board provided it is separated from the interior of the building by not less than 2 inches of mineral fiber insulation or equivalent in lieu of the thermal barrier or when applied as insulation when residing over existing wall construction.

(e) *Decorative trim.* Foam plastic used as decorative trim shall conform with the provisions of s. COMM 51.07.

(f) *Protection from ultraviolet light.* Foam plastic insulation installed on the exterior of buildings above grade shall be permanently covered or protected to prevent degradation caused by exposure to ultraviolet light.

(6) SPECIFIC APPLICATIONS.

(a) *Refrigerated facilities.*

1. Except as provided in subd. 2., foam plastic installed and meeting the requirements of sub. (2) when tested in a thickness of 4 inches may be used in thicknesses up to 10 inches in cold storage rooms, refrigerated food processing rooms, ice plants and similar areas. The foam plastic for refrigerated rooms within a building shall be protected on both sides by a thermal barrier as specified in sub. (3).

2. Except as provided in subd. 3., foam plastic insulation may be used without the thermal barrier when the foam plastic has a flame spread rating of 25 or less when tested as specified in subd. 1., is covered by not less than 0.032 inch of aluminum or corrosion-resistant steel having a base metal thickness not less than 0.016 inch at any point and is protected by an automatic fire sprinkler system. When a cooler or freezer module is located within a building, both the cooler or freezer module and that part of the building in which the module is located shall be protected by an automatic fire sprinkler system.

3. a. Foam plastics may be used in a thickness up to 4 inches in freestanding coolers or freezers having an aggregate floor area less than 400 square feet without a thermal barrier and without an automatic fire sprinkler system; or

b. Freezer warehouses may be constructed without automatic fire sprinkler system protection provided the entire freezer warehouse is equipped with a fire detection system conforming to NFPA 72 and the system is connected to a constantly attended station; the freezer warehouse is separated from all other use areas of the building (i.e., offices, loading docks, nonrefrigerated storage, mechanical rooms) by at least 2-hour fire-resistive rated construction; the freezer warehouse or separated freezer warehouse

part within a building is located to provide at least 30-foot separation to any property line or other building on the same property; and the foam plastic material complies with the provisions of sub. (7).

When applying the requirements for the refrigerated facilities and freezer warehouses, the department will consider as a freezer warehouse only those facilities where the temperature is maintained below 32°F. (0°C). Facilities maintaining higher temperatures are not considered freezer warehouses but will be considered refrigerated facilities.

Note: See ss. COMM 52.01 to 52.013 for additional rules pertaining to automatic fire sprinkler systems.

(b) *Bulk vegetable storage.* Buildings used exclusively for the bulk storage of vegetables shall have the foam plastic insulation protected on the occupied side by 5/8 inch exterior grade plywood, or equivalent.

(7) SPECIFIC MATERIALS APPROVAL. Foam plastic not meeting the requirements of this section may be approved by the department for specific application based on the submittal and written acceptance of data from approved diversified tests.

Note: See s. COMM 50.19 for additional information pertaining to product approval.

COMM 51.065 LIGHT-TRANSMITTING PLASTICS.

(1) SCOPE.

(a) The requirements of this section shall apply to the quality and methods of application of plastics for use as light- transmitting materials in buildings and structures. When used as interior finish, plastic materials shall meet the requirements of s. COMM 51.07.

(b) 1. Approved light-transmitting plastic specified under s. COMM 50.19 shall meet one of the following combustibility classifications:

a. CC 1 — Plastic materials which have a burning extent of one inch per minute or less when tested in nominal 0.060 inch-thickness or in the thickness intended for use by ASTM D 635; or

b. CC 2 — Plastic materials which have a burning rate of 2.5 inches per minute or less when tested in nominal 0.060 inch-thickness or in the thickness intended for use by ASTM D 635.

2. Light-transmitting plastic materials may be of any class as defined by this section. Before any light-transmitting plastic material may be approved for use, the manufacturer shall file with the department technical data which relates to the proposed use of the material. The data shall include the pertinent physical, mechanical and thermal properties, such as but not limited to weather resistance, expansion coefficient and combustibility characteristics. The department shall determine the adequacy of the data. Where the department determines that the material is satisfactory for the intended use, approval of the material shall be granted subject to the limitations specified in this section.

Note: See s. COMM 50.19 for additional information.

3. The department shall review and make a determination on an application for approval of light-transmitting plastic material within 30 business days of receipt of all technical data required to complete the review.

The light-transmitting plastics to be used in buildings, typically wall panels and skylights, must have a Wisconsin Material Approval Number. That Material Approval Number must be shown on the plans submitted for review.

(c) All light-transmitting plastic materials approved for use under this section or s. COMM 50.19 shall be identified by the trade formula, number or name.

(2) DEFINITIONS. For the purpose of this section, the following definitions shall apply.

(a) "*Approved light-transmitting plastic*" means a single layer or multilayered composite consisting of thermoplastic, thermosetting or reinforced plastic material which has a self-ignition temperature 650° F or greater when tested in accordance with ASTM D 1929, a smoke density rating no greater than 450 when tested in accordance with ASTM E 84 in the way intended for use, or a smoke density rating no greater than 75 when tested in the thickness intended for use by ASTM D 2843. Multilayered composite material shall comply as a composite in the configuration intended for use.

(b) "*Glass fiber reinforced plastic*" means plastic reinforced with glass fiber having not less than 20% of glass fibers by weight.

(c) "*Interior secondary glazing system*" means construction consisting of a glazed panel of approved light-transmitting plastic positioned on the interior side of a primary window set in an exterior wall which is designed primarily to control energy losses through exterior windows or glazed panels and is not intended for use as primary or exterior windows.

(d) "*Light diffusing system*" means a suspended construction consisting in whole or in part of lenses, panels, grids or baffles suspended below independently mounted electrical lighting sources.

(e) "*Plastic glazing*" means single glazing plastic materials which are glazed or set in a frame or sash and not held by mechanical fasteners which pass through the glazing material.

(f) "*Plastic roof panels*" means single glazing plastic materials which are fastened to structural members or to structural panels or sheathing and which are used as light-transmitting media in the plane of the roof.

(g) "*Plastic wall panels*" means single glazing plastic materials which are fastened to structural members or to structural panels or sheathing and which are used as light-transmitting media in exterior walls.

(h) "*Thermoplastic material*" means a plastic material which is capable of being repeatedly softened by increase of temperature and hardened by decrease of temperature.

(i) "*Thermosetting material*" means a plastic material which is capable of being changed into a substantially non-reformable product when cured.

(3) GLAZING OF UNPROTECTED OPENINGS.

(a) *General.* Doors, sash and openings which are not required to be protected with fire window or glass block assemblies may be glazed with approved light-transmitting plastic in the following occupancies:

Note: See Table 51.03-B for additional requirements pertaining to windows and wall openings.

1. Schools and Other Places of Instruction under ch. COMM 56;
2. Residential Occupancies under ch. COMM 57; and

3. All other occupancies under chs. COMM 54, 55, 58, 59, 60, 61 and 62, subject to the following requirements:

a. Except as provided in par. (b), the area of such light-transmitting plastic glazing may not exceed 25% of the wall face of the story in which it is installed;

b. Except as provided in par. (b) 2., the area of a pane of light-transmitting plastic glazing installed above the first story shall not exceed 16 square feet where the vertical dimension of a pane may not exceed 4 feet and there shall be a spandrel constructed of materials meeting the requirements for exterior walls of s. COMM 51.03 and Table 51.03-A for the class of construction utilized between stories measuring a minimum of 3 feet in the vertical dimension;

c. Except as provided in par. (b) 2., approved light-transmitting plastics shall not be installed more than 75 feet above grade level;

d. Combinations of light-transmitting plastic glazing and light-transmitting plastic wall panels shall be subject to the area, height and percentage limitations and separation requirements applicable to the class of plastics as specified in sub. (4).

(b) *Exceptions.*

1. Approved light-transmitting plastic glazing may be installed in areas up to 50% of the wall area of each story in structures less than 75 feet in height which are provided on each floor above the first floor with fire canopies projecting at least 3 feet from the surface of the wall and extending at least 3 feet horizontally beyond the edge of the opening above, or equivalent. The size and dimension requirements specified in par. (a) 3. b. shall not apply.

2. Where an approved automatic fire sprinkler system is provided, the permissible area of light-transmitting plastic glazing permitted by par. (a) 3. a. may be increased to a maximum of 50 percent of the wall face of the story in which the glazing is installed and shall be exempt from the requirements specified in par. (a) 3. b. and c.

(4) EXTERIOR WALL PANELS.

(a) *General.* Subject to requirements specified in par. (b), approved light-transmitting plastics may be used as wall panels in exterior walls not requiring a fire-resistive rating in all occupancies except the following:

1. Theaters and Assembly Halls under ch. COMM 55;

2. Health Care, Correctional and Detention Facilities under ch. COMM 58; and

3. All high hazard occupancies.

(b) *Area and separation limitations.*

1. Except as provided in par. (c), area limitation and separation requirements of exterior light-transmitting plastic wall panels shall be as specified in Table 51.065-1.

2. Vertical spandrel wall separation constructed of materials meeting the requirements for exterior walls of s. COMM 51.03 and Table 51.03-A for the class of construction utilized between stories shall be:

a. Three feet for CC 1 plastic wall panels; or

b. Four feet for CC 2 plastic wall panels.

TABLE 51.065-1
AREA LIMITATION AND SEPARATION
REQUIREMENTS FOR LIGHT-TRANSMITTING PLASTIC WALL PANELS*

Set-Back Distance to Property Line or Other Walls on Same Property	Class of Plastic	Maximum % Area of Exterior Walls in Plastic Panels	Maximum Single Area (Square Feet)	Minimum Separation of Panels (Feet)	
				Vertical	Horizontal
5' or less	—	NP	NP	—	—
5' or more but less than 10'	CC1	10	50	8	4
	CC2	NP	NP	—	—
10' or more but less than 30'	CC1	25	90	6	4
	CC2	15	70	8	4
Over 30'	CC1	50	Not Limited	3	0
	CC2	25	100	6	3

N.P. means not permitted.

* The requirements of this table do not apply to greenhouses. See ch. COMM 62, subch. VI.

(c) *Exceptions.*

1. In structures which are provided on any floor above the first with continuous horizontal projections extending at least 36 inches from the surface of the wall in which light-transmitting plastic wall panels are installed, there need be no vertical separation at that floor except that provided by the vertical thickness of the projection.

2. Where an approved automatic fire sprinkler system is provided in the building, the maximum percent area of light-transmitting plastic panels in the exterior wall and the maximum square feet of single area given in Table 51.065-1 may be increased 100% but in no case may the area of light-transmitting plastic wall panels exceed 50% of the wall area.

(5) ROOF PANELS.

(a) *General.* Except in chs. COMM 55 and 58 occupancies and high hazard occupancies, approved light-transmitting plastic roof panels may be installed as follows, subject to the requirements specified in par. (b):

1. In roofs of buildings protected by an approved automatic fire sprinkler system;

2. Where the roof is not required to have a fire resistance rating; or

3. Where the light-transmitting plastic roof panels meet the requirements for roof coverings of the appropriate class of construction.

Note: See s. A52.011 for additional information regarding high hazard occupancies.

(b) *Limitations.* Except as provided in par. (c), the use of light-transmitting plastic roof panels shall be limited as follows:

1. Individual light-transmitting plastic roof panels or units shall be separated from each other by a distance of not less than 4 feet measured in a horizontal plane.

2. Where exterior wall openings are required to be protected, no light-transmitting plastic roof panels or units may be installed within 8 feet of such exterior wall.

3. Light-transmitting plastic roof panels or units shall be limited in area and the aggregate area of panels shall be limited by a percentage of the floor area of the room or space sheltered in accordance with Table 51.065-2.

TABLE 51.065-2*
AREA LIMITATIONS FOR
LIGHT-TRANSMITTING PLASTIC ROOF PANELS AND SKYLIGHTS

Class of Plastic	Maximum Area Individual Unit or Panel (sq.ft.)	Maximum Aggregate Area (% of Floor Area)
CC1	300	33%
CC2	100	25%

* The requirements of this table do not apply to greenhouses. See ch. COMM 62, subch. VI.

(c) *Exceptions.*

1. One-story buildings not more than 16 feet in height and not exceeding 1200 square feet in area and not closer than 10 feet to another building are exempt from the limitations specified in par. (b).

2. Low-hazard use areas such as swimming pool shelters and similar structures, are exempt from the area limitations specified in par. (b) provided they do not exceed 5,000 square feet in projected floor area and are not closer than 10 feet to the property line or adjacent buildings.

Note: See s. A52.011 for additional information regarding low hazard occupancies.

(6) SKYLIGHTS.

(a) *General.* Subject to the requirements of par. (b), skylight assemblies may be glazed with approved light-transmitting plastic in all but high hazard occupancies.

Also see s. COMM 51.14 for safety glazing requirements.

(b) *Limitations.* Except as provided in par. (c), the use of skylights with approved light-transmitting plastic glazing shall be limited as follows:

1. The light-transmitting plastic shall be mounted at least 4 inches above the plane of the roof on a curb construction consistent with that required for the class of construction of the building;

2. Dome-shaped skylights shall rise above the mounting flange a minimum distance equal to 10% of the maximum span of the dome but not less than 5 inches;

3. The edges of the light-transmitting plastic skylights or dome shall be protected by metal or noncombustible material;

4. Each skylight unit of CC 1 material may have a maximum of 300 square feet within the curb and each skylight unit of CC 2 material may have a maximum of 100 square feet within the curb;

5. The aggregate area of skylights may not exceed 33P% when CC 1 materials are used, and 25% when CC 2 materials are used, of the floor area of the room or space sheltered by the roof in which they are installed;

6. Skylights shall be separated from each other by a distance of not less than 4 feet measured in a horizontal plane; and

7. Where exterior wall openings are required to be fire protected, no skylight may be installed within 6 feet of such exterior wall.

8. Combinations of light-transmitting plastic roof panels and skylights shall be subject to the area and percentage limitations and separation requirements as specified in sub. (5) (b).

(c) *Exceptions.*

1. The requirements of par. (b) shall not apply, if:

a. The building on which the skylights of approved light-transmitting plastic glazing are located is not more than one story in height, is located not less than 30 feet from a property line and any other building on the property, and the room or space sheltered by the skylight is not a means of egress, a ch. COMM 58 occupancy, or a high hazard occupancy; or

b. The approved light-transmitting plastic material meets the roof cover requirements for the appropriate class of construction.

2. Except in chs. COMM 55 and 58 occupancies and high hazard occupancies, the requirements specified in par. (b) 4. to 6. shall not apply to skylights with approved light-transmitting plastic glazing provided:

Approved means the light-transmitting plastic glazing has a DCOMM or Department of Commerce materials approval for this application.

a. The skylight serves as a fire venting system approved by a petition for variance as specified in s. COMM 50.25; or

b. The skylight is used in a building equipped with an approved automatic fire sprinkler system.

(7) LIGHT-DIFFUSING SYSTEMS.

(a) *Light diffusers.*

1. Unless protected with an approved automatic fire sprinkler system, plastic light-diffusing systems may not be installed in:

a. Theaters and assembly halls under ch. COMM 55;

b. Health care, correctional and detention facilities under ch. COMM 58; and

c. High hazard occupancies.

Note: See s. A52.011 for additional information regarding high hazard occupancies.

2. Plastic light-diffuser panels shall be supported directly or indirectly from ceiling or roof construction by use of noncombustible hangers.

3. No plastic light-diffusing system may be installed in areas required to be equipped with automatic sprinklers unless appropriate tests by a recognized laboratory have shown that such system does not prevent effective operation of the sprinklers or unless sprinklers are

located both above and below the light-diffusing system to give effective sprinkler protection.

4. Approved plastic materials for light-diffusing systems shall comply with s. COMM 51.07 unless the plastic panels comply with the following:

a. Fall from their mounting at an ambient temperature of at least 200°F. below the self-ignition temperature of the plastic material as measured by ASTM D 1929;

b. Remain in place at an ambient room temperature of 175°F. for a period of not less than 15 minutes; and

c. The maximum length of any single plastic panel does not exceed 10 feet and the maximum area of any single light diffuser does not exceed 30 square feet.

(b) *Electrical lighting fixtures.* Plastic light-transmitting panels and light-diffuser panels installed in approved electrical lighting fixtures shall comply with the requirements specified in par. (a) 4. a. to c.

(8) EXTERIOR VENEER. Approved light-transmitting plastic material may be installed as an exterior veneer for any building, provided:

(a) The plastic veneer may not be attached to any exterior wall to a height greater than 35 feet above grade;

(b) Sections of plastic veneer may not exceed 200 square feet in area; and

(c) Sections of plastic veneer shall be separated by a minimum of 4 feet vertically.

(9) INTERIOR SECONDARY GLAZING SYSTEMS.

(a) Light-transmitting plastic materials used in interior secondary glazing systems shall comply with the requirements of s. COMM 51.07 unless the approved plastic used in the interior secondary glazing system meets the following requirements:

1. The approved plastic used as the glazing falls from its mounting either with or without its frame or sash at an ambient temperature of at least 200° F. below the self-ignition temperature of the plastic material as measured by ASTM D 1929;

2. Interior secondary glazing system is not installed over windows required for egress unless approved tests have shown that the system does not interfere with egress from the window; and

3. The maximum length of any single plastic panel does not exceed 10 feet and the maximum area of any single panel does not exceed 30 square feet.

COMM 51.07 INTERIOR FINISHES.

(1) SCOPE. The requirements of this section apply to the interior finishes or surfaces of a building.

Note #1: See s. COMM 51.06 for the restrictions of foam plastics.

Note #2: Toxicity of the products of combustion is not included as a basis in determining the smoke developed criteria of this section. The smoke developed criteria is based solely upon the obscuration of light.

(2) APPLICATION TO MATERIALS.

(a) Except as provided in par. (b), the classification of interior finish materials as specified in this section shall include the basic material used by itself or in combination with other materials.

Carpeting and other similar napped, tufted or looped material when used as a wall or ceiling finish must meet the indicated Class A, B or C requirements. Just because carpeting meets the test criteria for floor finish, does not necessarily mean it will meet a Class A, B or C wall or ceiling requirement. If carpeting or similar materials are desired for wall or ceiling finishes, documentation indicating approval as a Class A, B or C finish should be obtained from the supplier of the material.

Data related to the flame spread rating, smoke developed rating, and, for floor carpeting, the critical radiant flux should be given to the building owner and kept at the building site for the benefit of building and fire inspection.

(b) Subsequently applied paint or wall covering not exceeding 1/28 inch in thickness and classified 450 or less on the smoke test scale are exempt from the provisions of par. (a).

(3) TRIM AND INCIDENTAL FINISH.

(a) Interior finish not in excess of 10% of the aggregate wall and ceiling areas of any room or space may be Class C materials in occupancies where interior finish of Class A or Class B is required.

(b) In addition to the other requirements of this section, foam plastic used as interior trim and incidental finish shall also comply with the following:

1. The minimum density is 20 pounds per cubic foot;
2. The maximum thickness of the trim is 1/2 inch and the maximum width is 4 inches;
3. The trim constitutes no more than 10% of the area of any wall or ceiling; and
4. The flame-spread rating does not exceed 75 when tested in accordance with ASTM E-84 and the smoke developed rating is not limited.

(4) EXPOSED CONSTRUCTION.

(a) This section does not require the installation of interior finish, but where construction or fire protection materials are exposed in rooms or spaces used for the occupancies specified, the hazard from rate of flame spread of the exposed materials shall be not greater than that of the interior finish permitted for such occupancy or use.

(b) Exposed portions of structural members of Type No. 4-Heavy Timber Construction shall not be subject to the interior finish requirements of this section.

(5) USE OF INTERIOR FINISHES. Interior finish material shall be used in accordance with requirements specified in Table 51.07.

(6) APPLICATION OF INTERIOR FINISH.

(a) *Attachment.* Interior finish materials shall be applied or otherwise fastened in such a manner that they will not readily become detached when subjected to room temperature of 200° F. or less for 30 minutes, or otherwise become loose through changes in the setting medium from the effects of time or conditions or occupancy.

(b) *Application to structural elements.*

1. Interior finish materials applied to walls, ceilings or structural elements of a building or structure which are required to be of fire-resistive rated or noncombustible construction shall be applied directly against the exposed surface of such structural elements or to furring strips attached to such surfaces.

2. Where furring strips are used, all concealed spaces shall be firestopped into areas not greater than 10 square feet in area or 8 feet in any dimension.

TABLE 51.07
MINIMUM INTERIOR FINISH REQUIREMENTS

Occupancy	Required Exit Enclosures[1]		Exit Access[1,2]		Rooms or Enclosed Spaces[1,2]	
	Walls & Ceilings[4]	Floor[5]	Walls & Ceilings[4]	Floor[5]	Walls & Ceilings[4]	Floor[3,5]
Ch. COMM 54 Occupancies Other than Storage and Warehouses	A	II	A or B	II	A, B or C	DOC FF-1[6]
Ch. COMM 54 Storage and Warehouse Occupancies	A or B	DOC FF-1[6]	A or B	DOC FF-1[6]	A, B, or C	DOC FF-1[6]
Ch. COMM 55 Places of Assembly	A	I	A	II	A or B[7]	DOC FF-1[6]
Ch. COMM 56 Places of Instruction						
Ch. COMM 57 Residential Occupancies	A	I	A or B	II	A, B or C	DOC FF-1[6]
	A	II	A or B	II	A, B or C	DOC FF-1[6]
Ch. COMM 58 Health Care and Places of Detention	SEE CHAPTER COMM 58 FOR SPECIFIC REQUIREMENTS					
Ch. COMM 59 Hazardous Occupancies	A	DOC FF-1[6]	A or B	DOC FF-1[6]	A, B or C	DOC FF-1[6]
Ch. COMM 60 Day Care Centers (20 Children or Less)	A or B	DOC FF-1[6]	A or B	DOC FF-1[6]	A, B or C	DOC FF-1[6]
Ch. COMM 60 Day Care Centers (More than 20 Children)	A	II	A or B	II	A, B or C	DOC FF-1[6]
Ch. COMM 62 Specialty Occupancies	A, B or C	DOC FF-1[6]	A, B or C	DOC FF-1[6]	A, B or C	DOC FF-1[6]

Notes to Table 51.07

[1] Exposed portions of structural members of Type No. 4-Heavy Timber Construction are not subject to the requirements of this table.

[2] Where a complete automatic sprinkler system is installed, materials with an interior finish of Class B or C may be used in places where Class A or B materials, respectively, are required and floor finish materials with an interior finish of Class II or materials complying with the DOC FF-1-70 "pill test" may be used in places where Class I or II materials, respectively, are required.

[3] Requirements for rooms or enclosed spaces are based upon the spaces being separated from exit access corridors and exits by partitions extending from the floor to the ceiling. Where the room or enclosed space is not separated from the exit access corridor, the room or space is considered part of the exit access or the exit.

[4] Materials having napped, tufted, looped or similar surfaces, such as carpet, when applied on walls or ceilings shall meet the requirements for Class A interior finish.

[5] Wood, vinyl, linoleum, terrazzo, resilient and other approved finished floors or floor covering materials are exempt from the provisions of this table.

[6] All carpet manufactured for sale in the U.S. is required by federal regulations to comply with the DOC FF-1-70 "pill test" (16 CFR Para 1630). If a material other than carpet is used, the material should be shown to be resistant to flame propagation as a material which passes the DOC FF-1-70 test (minimum critical radiant flux of 0.04 watts/cm2).

[7] Class C interior finish materials may be used in places of assembly with a capacity of 400 persons or less.

(c) *Furred construction.* Where walls, ceilings or other structural elements are required to be of fire-resistive rated or noncombustible construction, and the interior finish is set out or dropped distances greater than 10 inches from the surface of the elements, only material of which both faces qualify as Class A shall be used, unless the finish material is protected on both sides by an approved automatic fire suppression system or is attached to a noncombustible backing as specified in par. (e) or to furring strips applied directly to such backing as specified in par. (b).

(d) *Class B and C finish materials.* Interior finish materials, other than Class A materials, which are less than 1/4 inch in thickness shall be applied directly against a noncombustible backing or a backing of fire-retardant treated wood unless the tests under which the material has been classified were made with the materials suspended from the noncombustible backing.

(e) *Backing material.*

1. Backing for interior finish materials shall be a continuous surface with permanently tight joints, equal in area to the area of the finish, and extending completely behind such finish in all directions.

2. Backing shall be of noncombustible or fire retardant treated wood materials.

3. When the backing does not constitute an integral part of the structural elements or system, it shall be attached directly to the structural elements or to furring strips as specified in par. (b) or may be suspended from the structural members at any distance provided concealed spaces are firestopped as specified in s. COMM 53.63 (1).

Note: See s. COMM 51.01 (75a) for further explanatory information.

Class A Interior Finish -- flame spread 0-25, smoke developed 0-450.

Class B Interior Finish -- flame spread 26-75, smoke developed 0-450.

Class C Interior Finish -- flame spread 76-200, smoke developed 0-450.

Class I Interior Floor Finish -- critical radiant flux -- .45 watts/cm2

Class II Interior Floor Finish -- critical radiant flux -- .22 watts/cm2

When wood structural elements are exposed (such as exposed wood trusses), the interior finish requirements must be satisfied for those elements. The following may be used as a guide for evaluating the flame spread of wood.

(The following is commentary material)
Flame Spread Classification of Wood
Prepared by National Forest Products Association

Species of Wood	**Flame Spread**	**Source**
Birch, Yellow	105-110	UL
Cedar, Eastern Red	110	HUD/FHA
Cedar, Pacific Coast Yellow	78	CWC
Cedar, Western Red	70	HPMA
Cottonwood	115	UL
Cyprus	145-150	UL
Fir, Douglas	70-100	UL
Gum, Red	140-155	UL
Hemlock, West Coast	60-75	UL
Lodgepole Pine	93	CWC
Maple Flooring	104	CWC
Oak, Red or White	100	UL
Pine, Eastern White	85	CSC
Pine, Idaho White	72	HPMA
Pine, Northern White	120-215	UL
Pine Ponderosa	105-200	HUD/FHA
Pine, Red	142	CWC
Pine, Southern Yellow	130-190	HUD/FHA
Pine,Western White	75	UL
Poplar	170-185	UL
Redwood	70	UL
Spruce, Northern	65	UL
Spruce, Western	100	UL
Spruce White	65	CWC
Walnut	130-140	UL
Plywoods		
Douglas Fir 1/4"	120	HUD/FHA
Lauan, 3-ply urea glue 1/4"	110	HUD/FHA
Particleboard 1/2"	135	HPMA
Redwood 3/8"	95	UL
Redwood 5/8"	75	UL
Walnut 3/4"	130	HUD/FHA

Sources:
CWC - Canadian Wood Council - Data File FP-6
HPMA - Hardwood Plywood Manufacturer's Association, Test No. 337, Test No. 592, Test No. 596
HUD/FHA - Flame Spread Ratings for Various Materials
UL - Underwriters Laboratory

COMM 51.08 OCCUPANCY SEPARATIONS AND HAZARD ENCLOSURES.

(1) When a building is used for more than one purpose, each part of the building comprising a distinct occupancy division shall be separated from any other occupancy division in accordance with Table 51.08-1.

The intent of an occupancy separation is to prevent smoke and/or fire in a portion of a building utilized as specified within an occupancy chapter from affecting a portion of the building utilized for a different occupancy chapter.

(2) Hazards shall be enclosed in accordance with Table 51.08-2.

Note: See Table 51.03-A, footnote p for elevator machine room ratings.

(3) Openings in occupancy separations or hazard enclosures shall be protected be protected by fire-door assemblies as specified in s. COMM 51.047 or by fire-window assemblies as specified in s. COMM 51.048 or as specified in s. COMM 51.049.

See COMM 51.02 (13)(c) commentary for opening restrictions.

TABLE 51.08-1
OCCUPANCY SEPARATIONS
MINIMUM FIRE-RESISTIVE RATINGS IN HOURS

Occupancies	Ch 54	Ch 55		Ch 56	Ch 57	Ch 58		Ch 59				Ch 60	Ch 61	Ch 62 Open Park'g. Struc.
		Occu-pants ≤ 750	Occu-pants > 750			Health Care	Deten-tion	≤ 500 sq ft		>500 sq ft				
								Storage	Repair	Storage	Repair			
Ch 54	0	3[n]	4[n]	0	i	2[n]	2[b]	1[c, d]	2	2[c, d]	3	0	0	NC-2
Ch 55														
≤ 750 occupants	3[n]	3[e]	4[e]	3[f, g]	3	3[a]	3[b]	3	4	3	4	3[h]	3	3
> 750 occupants	4[n]	4[e]	4[e]	4[f, g]	4	4[a]	4[b]	4	4	4	4	4[h]	4	4
Ch 56	0	3[f, g]	4[f, g]	0	i	2[a]	2[b]	2	3	2	3	0	0	NC-2
Ch 57	i	3	4	i	i	2[a]	2[b]	1[c]	2	2[c, i]	3	i	i	NC-2
Ch 58														
Health Care	2[a]	3[a]	4[a]	2[a]	2[a]	0	2[b]	3	4	3	4	2	2	NC-2
Detention	2[b]	3[b]	4[b]	2[b]	2[b]	2[b]	0	3	4	3	4	2	2	NC-2
Ch 59														
Storage ≤ 500 sq ft	1[c, d]	3	3	2	1[c]	3	3	0	1[k]	1[k]	1[k]	1	m	1[k]
Repair ≤ 500 sq ft	2	4	4	3	2	4	4	1[k]	0	1[k]	1[k]	2	2	1[k]
Storage > 500 sq ft	2[c, d]	3	3	2	2[c, j]	3	3	1[k]	1[k]	0	1[k]	2	m	1[k]
Repair > 500 sq ft	3	4	4	3	3	4	4	1[k]	1[k]	1[k]	0	3	3	1[k]
Ch 60	0	3[h]	4[h]	0	i	2	2	1	1	2	3	0	0	NC-2
Ch 61	0	3	4	0	i	2	2	m	2	m	3	0	0	NC-2
Ch 62 Open Parking Structures	NC-2	3	4	NC-2	NC-2	NC-2	NC-2	1[k]	1[k]	1[k]	1[k]	NC-2	NC-2	0

Keys and Examples: NC = Noncombustible construction; 0 = 0 (No hourly rating); NC-2 = Noncombustible construction 2-hour rating.

FOOTNOTES TO TABLE 51.08-1:

a. Auditoriums, chapels, residential facilities and other similar areas provided for the patients or employes of health care facilities need not be separated from the health care facility. Also, administrative offices, doctors' offices, medical clinics and laboratories which are intended primarily to provide in-house services or support to the health care facility need not be separated from the health care facility. Doctor's offices, medical clinics and other similar areas which are intended to provide out-patient services independent of the health care facility shall be separated in accordance with the table.

b. Auditoriums, chapels, residential facilities, administrative offices, medical clinics, educational facilities, workshops and other similar areas which are provided for the residents or employes of the detention facility need not be separated from the facility.

c. An occupancy separation need not be provided within a fire station or other similar facility to separate vehicles from other areas of the building, if the vehicles are directly and permanently related to the functions of the building.

d. An occupancy separation need not be provided within an office, factory or warehouse occupancy to separate a storage garage accommodating one or 2 vehicles which are directly related to the functions of that occupancy. If a storage garage accommodating one or 2 vehicles within an office, factory or warehouse occupancy is part of a multi-occupancy/multi-tenant building (i.e., strip shopping center), the occupancy separation shall be provided at least at the adjoining tenants' walls.

e. An occupancy separation need not be provided to separate two adjoining assembly hall areas or functions located within the same building, if the operation or control of the two assembly areas are under the same owner or tenant.

f. An occupancy separation need not be provided between a church and a day school operated by the church provided both occupancies conform with the most restrictive requirements of chs. COMM 55 and 56.

g. An occupancy separation need not be provided between an assembly hall or theater and an instructional facility regulated under ch. COMM 56 if the operation and control of the two occupancies is under the same owner.

h. An occupancy separation need not be provided to separate a day care center from an assembly hall occupancy, if the day care center conforms with the more stringent requirements of ch. COMM 55.

i. See s. COMM 57.01 concerning living unit separations.

j. Storage garages, attached to residential occupancies under the scope of ch. COMM 57, may be separated from a residential occupancy by at least one-hour fire-resistive construction, if the storage garage is divided by walls with at least one-hour fire-resistive ratings into spaces with floor areas not exceeding 600 square feet.

k. An occupancy separation need not be provided to separate adjoining storage garages, repair garages or open parking structures which are located within the same building, if the entire building conforms to the most stringent occupancy requirements of chs. COMM 59 and 62, subch. I.

m. Storage garages, attached to CBRF occupancies under the scope of ch. COMM 61, may be separated from a CBRF by:

- Common walls between the garage and the CBRF protected with not less than one layer of 5/8-inch Type X gypsum board with taped joints, or equivalent, on the garage side and with not less than one layer of 1/2-inch gypsum board with taped joints, or equivalent, on the CBRF side;

- Floor-ceiling assemblies between garage and the CBRF protected with not less than one layer of 5/8-inch Type X gypsum board on the garage side of the ceiling or roof framing; and

- Openings between the garages and the CBRF protected by self-closing, 1 3/4-inch solid wood core doors or with self-closing doors of equivalent fire-resistive rating.

n. Public mausoleums constructed adjacent to or as part of an assembly hall need not be provided with an occupancy separation.

o. All openings in occupancy separations involving detention facilities shall be protected by fire-resistive door assemblies as specified in s. COMM 58.60.

See s. COMM 61.10 (2) concerning detached garages serving CBRF's.

Department of Health and Social Services has stricter requirements for buildings with joint occupancies. See DHSS 83.41 (12).

School vocational and industrial arts shops *involving motor vehicles such as auto mechanics and agricultural shops must be isolated from the balance of the school building and are also required to meet the electrical requirements of Article 511 of the National Electrical Code (NEC). Individual shops involving motor vehicles need not be separated from other non-vehicular vocational shops provided the entire vocational or industrial arts area is separated and all electrical wiring is in compliance with Article 511 of the NEC. This separation involves walls with no openings or the motor vehicle shop area and all connecting spaces at a lower elevation of 18 inches minimum. Electrical wiring and equipment installations shall follow the requirements of NEC Article 511.*

Exiting Over a Garage Roof *The department will allow exiting on a garage roof providing the garage roof ceiling is rated one hour greater than the required 51.08 occupancy separation. Also see 51.01 (36)(b) for additional criteria for exiting via a roof.*

Car Stereo, etc. Installation Question: *What is the required occupancy separation between other occupancies and areas utilized for cellular phone, stereo, and similar electronic installation into motor vehicles?*

Answer: *COMM 64.62 Vehicle service buildings applies to liquid fuel dispensing stations and facilities where vehicles can be driven into the building for washing, greasing, oil change, tire replacement, body repair, and similar operations.*

The similar operations refer to any area where vehicles are driven into a work station situation. This would include vehicle repair or service estimate areas, drive-in insurance claims, auto upholstery, glass replacement, sun roofs, and radio installation.

COMM 59.01 (6) "Repair garage" means a structure or any part of a structure in which one or more motor vehicles are primarily repaired or serviced.

Thus, vehicle service (electronic installation, etc.) is classified as a repair garage.

The installation of cellular phones and similar electronic devices into motor vehicles is classified as repair garage use, thus occupancy separations shall comply with COMM Table 51.08 for Chapter 59 repair.

It should be noted that the building designer has the option of locating this type of use in a separate detached building. Offices and storage rooms serving only the installation/repair garage do not have to be separated from the installation/repair area providing the entire tenant space complies with COMM 59 requirements.

When the building houses multiple tenants, the installation/repair garage tenant must be separated from other uses as required by COMM Table 51.08.

As an option, the designer may also separate the installation/ repair tenant space into sections less than 500 square feet by 1-hour fire rated walls thereby reducing the fire-resistive rating of the occupancy separation as noted in COMM 51.08.

Auto Repair/Auto Parts Question: *Is an occupancy separation required between an auto repair area and an auto parts sales area?*

Answer: *Table 51.08 indicates that a rated separation is required between a repair garage (COMM 59) and a retail space (COMM 54). The department will not require a separation between a garage and a retail space if the merchandise sold in the retail space is vehicle related. Examples of such operations include cellular telephone sales and the garage where the telephones are installed; tire, battery and automotive parts and a service or repair garage; an automotive radio/stereo store and the garage where the radios are installed; etc. If there is no separation in*

accordance with COMM Table 51.08, the entire building, garage and retail will be considered a repair garage for code application purposes. The ventilation requirements in the retail portion may be based on a COMM 54 usage if a solid separation is maintained between the garage and retail space. In a multi-tenant building, such as a shopping center, the garage separation must be provided between the garage/retail tenant and adjoining tenants, and the mall corridor.

A question arises as to how much nonvehicle-related merchandise can be sold in the retail portion of a garage/retail establishment before the department will require a separation between the garage and retail space. A pop or candy machine may be present, the cellular telephone store may sell other types of telephones, the auto radio/stereo store may also sell televisions, etc. In order to allow a degree of flexibility, the department will allow approximately 10 percent of the retail floor space to be devoted to nonvehicle-related items and still consider the retail space related to the garage, thus allowing omission of the occupancy separation.

Elective Occupancy Separation Question: *COMM 51.08 does not require occupancy separations between several pairs of occupancies: 54/56, 54/60, 54/61, 56/60, 56/61 and 60/61. The department requires that if a building contains two or more occupancies, non-separated, and if specific requirements for the different occupancies conflict, the most restrictive requirement applies throughout the building. If it is desired to use differing requirements in each occupancy area by providing an occupancy separation, what separation is required?*

Answer: *If two or more occupancies are present in a building, and COMM 51.08 does not require a separation, the occupancy requirements of all occupancies must be met, and where they conflict, the most restrictive shall apply. If an occupancy separation is provided with a rating in accordance with Table 51.03-A, Line 20, each occupancy need only meet its own occupancy requirements.*

If the occupancy separation provision indicated above is utilized, exiting paths for the building must go from less restrictive requirement to more restrictive requirement (i.e., in a 54/56 building, exiting must go from 54 to 56 because if the stairs are open in the 54 occupancy, the 56 occupants may not use them for exiting, therefore prohibiting exiting 56 through 54.

Type 7 & 8 Assembly Halls *- See s. COMM 55.02(2m) regarding type 7 & 8 assembly halls built in conjunction with another occupancy.*

Recreational areas in hotels and motels *such as swimming pool enclosure can be classified either as Chapter COMM 55 or COMM 57 occupancies. If classified under the scope of COMM 55, an occupancy separation will be required. If classified under COMM 57, no occupancy separation is required. In order to classify such recreational areas under the scope of Chapter COMM 57, the owner must agree to limit occupancy of those recreational areas to hotel/motel residents and their guests. The area may not be rented to or used by the general public. Hotel/motel lounges, restaurants and banquet facilities must always be classified under the scope of Chapter COMM 55 if the combined capacity exceeds 100 persons.*

Church/School: It is not necessary to separate a Chapter COMM 55 church from a Chapter COMM 56 parochial day school provided the entire building meets the requirements of both Chapters COMM 55 and COMM 56 and where the two chapters conflict, the most restrictive requirement is satisfied.

Common Seating Areas: Individual small taverns and restaurants, each having a capacity of less than 100 and separated from each other by solid walls, will ***not*** *be considered as a Chapter COMM 55 occupancy even if the combined capacities exceed 100. This is typically found in shopping centers having several small fast food outlets. They will be individually reviewed under the scope of Chapter COMM 54. However, if a common dining area is provided to serve two or more such*

establishments such as a shopping center food court and if the capacity of that common area exceeds 100, it is considered a Chapter COMM 55 occupancy requiring separation from the balance of the shopping center. In this case, however, the individual fast food outlets, although COMM 54 occupancies, need not be separated from the common dining area.

Also, capacity of adjacent tenant spaces utilized for dining, recreation, or worship shall be cumulative if occupants can move directly between the spaces without utilizing the mall corridor.

Table 51.08-2

Occupancies	Hazard Isolation Flammable and combustible liquids, trash collection rooms, maintenance shops, generators, woodworking shops, clothes dryers, and similar hazards determined by the department		Exceptions See ch. COMM 10 for flammable/combustible liquid requirements See exceptions in footnotes 1, 2, 3, 4 and 5
	≤ 3 stories	> 3 stories	
Ch 54	2	2	1-hour isolation permitted for 1-story bldgs <3,000 sq ft
Ch 55 ≤ 750 occupants > 750 occupants	3	3	2-hour isolation permitted for bldgs with a capacity of ≤ 300 people
Ch 56	4	4	2-hour isolation permitted for 1-story bldg
Ch 57	1	2	
Ch 58 Health care Detention	2	3	
Ch 59 Storage ≤ 500 sq ft Repair ≤ 500 sq ft Storage > 500 sq ft Repair > 500 sq ft	2	2	
Ch 60	1	2	
Ch 61	N/A	N/A	N/A
Ch 62 Open parking structures	2	2	
Ch 62 Assembly seating facilities	2	2	
Ch 62 Greenhouses	1	N/A	
Ch 62 Mini-storage Buildings	2	2	1-hour isolation permitted for 1-story bldgs <3,000 sq ft

Fuel-fired equipment that is solely used for process purposes (manufacturing, cooking, etc.) and is normally in view of and under the control of employes while in operation is not required to be enclosed.

Footnotes

(1) Fuel-Fired Heating Equipment. All gas- and oil- fired boilers, furnaces and water heaters shall be provided with a 1 hour fire-resistive-rated enclosure. Solid fuel burning equipment shall be provided with a 2 hour fire-resistive-rated enclosure. All openings in the enclosure shall be protected as specified in ss. COMM 51.047 and COMM 64.42. Use of hold open devices is prohibited. All fire-rated construction shall comply with ss. COMM 51.04 to 51.049.

(2) Combustible and Flammable Liquids. Combustible and flammable liquids shall be isolated in accordance with ch. COMM 10.

(3) Clothes Dryers. All gas, oil, or electric clothes dryers shall be isolated by 2-hour construction. The following exceptions apply to chs. COMM 54, 55, 56, 57, 59 and 60:

a. Up to 2 co-located residential clothes dryers that each have a rated capacity of 37,000 Btu/hour or less may be used without a fire-resistive rated enclosure, provided that any associated gas piping includes a full-flow automatic shut-off valve.

b. Isolation of clothes dryers is not required where automatic fire sprinkler protection is provided for the clothes dryer and a full-flow automatic shut-off valve is provided for any associated gas piping.

The references in Footnote (3) to full flow automatic shut-off valves mean that the gas flow is automatically stopped if there is a sudden pressure drop as when there is a break in the piping downstream of the valve.

(4) Standby Emergency Generators. Fuel-fired emergency generators shall be isolated by 2-hour, fire-resistive construction. Emergency generators required by COMM Table 16.46 (referenced by COMM 52.20) shall be located separately in a 2-hour fire-resistive-rated room with no other equipment or electrical service equipment which is not a part of the emergency and standby power system.

(5) Fire-resistive ratings may be reduced as per COMM 51.02 (22).

COMM 51.14 SAFETY GLAZING.

(1) SCOPE. This section applies to fixed or operating glazed flat panels adjacent to doors; fire window assemblies; display cases within 7 feet of the floor in schools; skylights; sloped glazing and any other glazing materials used in hazardous impact areas which are not included within the scope of the federal consumer product safety commission (CPSC) standard for architectural glazing materials, 16 CFR, para. 1201.

For information concerning the Federal Consumer Product Safety Commission (CPSC) Standard for Architectural Glazing Materials, 16 CFR, 1201, call (312) 353-8260.

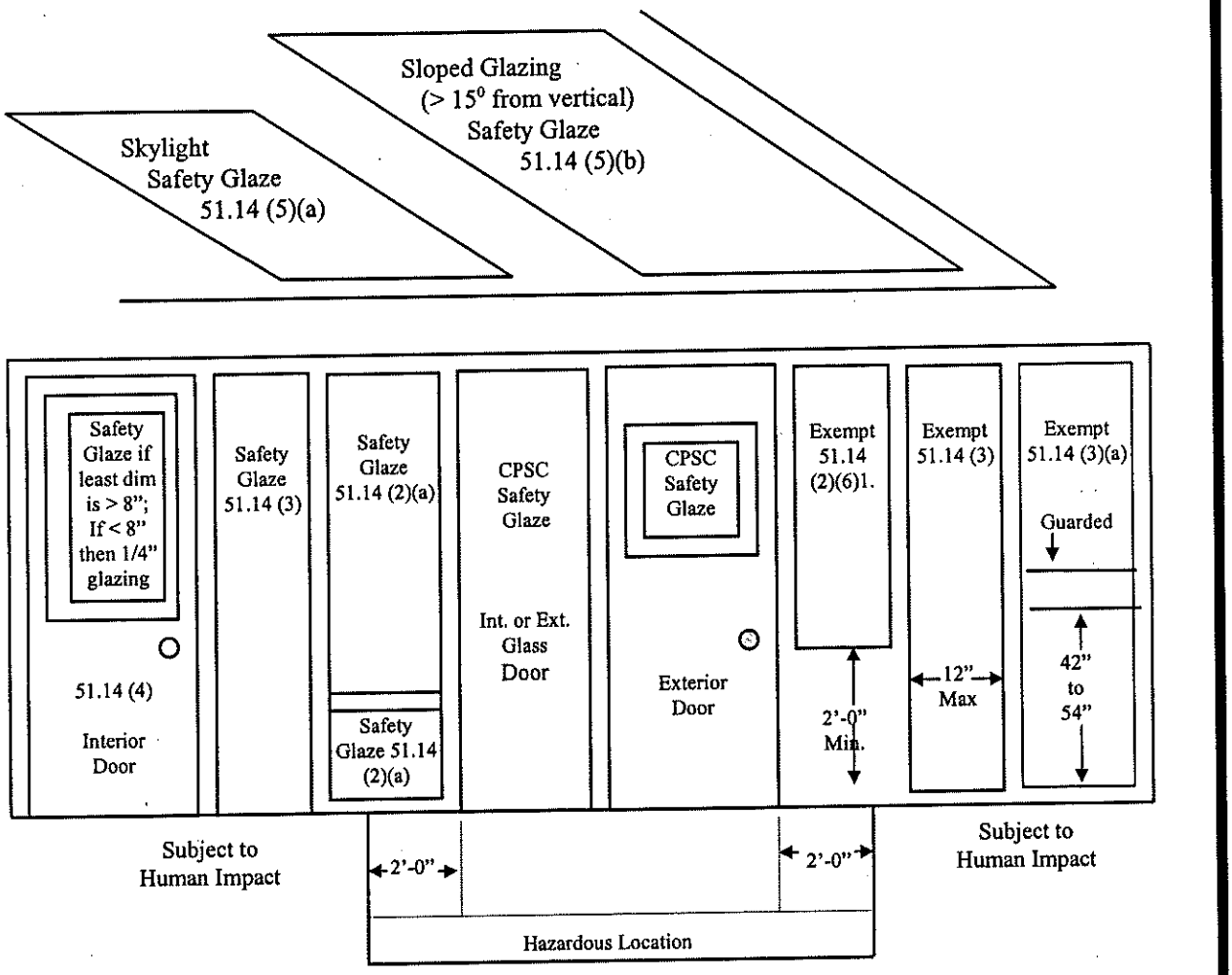
Note: The CPSC standard for architectural glazing materials pre-empts state and local regulations for framed or unframed interior or exterior glazed doors, exterior doors with glazed lights, sliding doors and the adjacent glazed fixed or operating panel, storm doors, shower doors, walk-in mirror closet doors and tub enclosures.

(2) APPLICATION. All glazing material used in hazardous impact locations shall be safety glazing material. All replacements of glazing material in hazardous impact locations made after November 30, 1976, shall be safety glazing, except that the replacement of glazing shall be as specified in sub. (3).

(a) *Location.* Hazardous impact locations shall include all glazed elements such as framed or unframed interior or exterior glass doors, the first fixed or operating flat panel within 2 feet of nearest vertical edge of an entrance or exit door, exterior doors with glass lights, or any other glazed elements which may be mistaken for a means of egress or ingress to a room or building. Other hazardous impact locations shall include sliding doors and the adjacent glazed fixed or operating panel, storm doors, shower doors, tub enclosures and display cases within 7 feet of the floor in schools except as follows:

1. A fixed or operating flat panel immediately adjacent to an entrance or exit door is exempt from the requirements of this paragraph if the lower horizontal edge of the panel is 2 feet or more above the floor; or

2. Any mirror, framed glazed picture or similar decorative object which is attached to a door or wall in a hazardous impact location and which does not in whole or in part conceal any opening in such door or wall is exempt from the requirements of this paragraph.



Safety Glazing

(b) *Material.* Safety glazing shall include any glazing material including but not limited to tempered glass, laminated glass, wired glass, safety plastic, or safety insulating units which meet the test requirements of ANSI Z97.1, and which are constructed, treated or combined with other materials so as to minimize the likelihood of cutting and piercing injuries resulting from human impact with the glazing material.

(c) *Labeling.* Safety glazing material shall be labeled with a permanent label by such means as etching, sand blasting, firing of ceramic material, or hot die stamping. The label shall be legible and visible after installation. Labels identifying safety glazing materials may be omitted provided that a notarized affidavit or invoice is submitted to the department or owner

upon request certifying the installation of safety glazing material. The label or affidavit shall identify the seller, manufacturer, fabricator, or installer, the nominal thickness and type of safety glazing material, and the fact that the material meets the test requirements of ANSI Z97.1.

(3) GUARDING OF GLAZING. All interior and exterior glazed panels, subject to human impact not in a hazardous impact location, shall be guarded or provided with safety glazing, except that glazed panels with a sill height of 2 feet or more, or glazed panels less than 12 inches in width, are not required to be safety glazed or guarded.

(a) Guarding shall consist of a horizontal bar, rail, mullion, grille or screen at least 1 1/2 inches wide and located within 3 feet 6 inches to 4 feet 6 inches above the floor. The guard assembly shall be capable of withstanding a lateral force of 100 pounds applied at any point and installed to avoid contact with the glazing when the force is applied.

(b) Safety glazing materials shall be as specified in sub. (2) (b).

(c) For replacement of glazing in buildings contracted for or existing prior to November 30, 1976, the installation of a horizontal bar, rail, mullion, grille or screen as a protective device may be provided in lieu of safety glazing material in hazardous impact locations where safety glazing would be impractical because of the size of the light required.

(4) INTERIOR DOORS WITH GLASS LIGHTS.

(a) All interior doors with glass lights greater than 8 inches in the least dimension shall be provided with safety glazing material.

(b) All interior doors with glass lights less than 8 inches in the least dimension shall be provided with 1/4-inch glazing material.

(c) Safety glazing materials shall be as specified in sub. (2) b).

(5) SKYLIGHTS AND SLOPED GLAZING.

(a) *Skylights.* All glazing in skylights shall be safety glazing material and light-transmitting plastic and shall comply with the requirements specified in s. COMM 51.065 (5) or (6).

(b) *Sloped glazing.* All glazing installed more than 15° with the vertical shall be safety glazing material. This paragraph does not apply to greenhouses.

(c) 1. Except as provided in subd. 2., heat-strengthened glass or fully tempered glasses if used in an overhead application shall have a screen or equivalent protection installed below the glass.

a. The screen shall be installed not more than 4 inches from the glass.

b. The screen shall be capable of supporting the weight of the glass.

c. The screen shall be constructed of noncombustible material not thinner than 0.08 inches.

d. The mesh in a screen may not be larger than one inch by one inch.

Heat-strengthened glass has been reheated to just below its melting point and then cooled. This creates a compression on the outer surface which increases the strength of the glass. Heat-strengthened glass has the unsatisfactory characteristic of breaking into shards, thus requiring screen protection below the skylight.

Tempered glass is glass which has been specially heat treated or chemically treated to provide high strength. When broken, the entire piece of glass immediately breaks into numerous small granular pieces. Tempered glass is subject to spontaneous breakage, such that large chunks of glass may fall under this condition, thus this also requires screen protection.

Laminated glass is usually furnished with an interlayer of polyvinylbutyrate, which has a minimum thickness of 0.030 inches. Such glass is highly resistant to impact and as a result requires no further protection below. The department will accept laminated glass (including laminated heat-strengthened or laminated fully-tempered glass) as equivalent protection providing it will support the weight of the glass above.

2. a. Fully-tempered glass may be used without a screen or equivalent protection, if the glass is at a slope of 30° or less from vertical and the highest point of the glass is 10 feet or less above any floor level under the sloped glass.

b. Glazing materials may be used without a screen or equivalent protection, if the walking surface or any other accessible area below the glazing is permanently protected from the risk of falling glass for a minimum horizontal distance equal to twice the height.

(6) FIRE WINDOW ASSEMBLIES. All glazing in fire window assemblies shall be designed and installed as specified in s. COMM 51.048.

(7) STRUCTURAL REQUIREMENT. Glazing material shall be designed and installed to safely withstand the loads specified in ch. COMM 53.

Note: Section 101.125, Stats., requires safety glazing in all hazardous locations.

COMM 51.15 STANDARD EXIT.

When using the exiting requirements of ss. Comm 51.15 - 51.20, be careful to also consider the applicable accessibility requirements of Ch. Comm 69 and Ch. 57, Subchapter 2.

(1) Every door which serves as a required exit door or exit access door from an area, room, public passageway, stairway or building shall be a standard exit door unless exempted by the occupancy requirements of this code.

Note: See ss. COMM 54.06, 55.10, 56.08, 57.06, 58.04, 58.49, 59.14, 60.12, 61.12, 62.26, 62.47 and 62.75 for requirements regarding required exits.

(2) Every standard exit door shall swing outward or toward the natural means of egress. It shall be level with the floor, and shall be so hung that, when open, it will not block any part of the required width of any other doorway, passageway, stairway or fire escape. No revolving door, overhead door or sliding door may be considered as a standard exit, except as permitted in the occupancy chapters of this code.

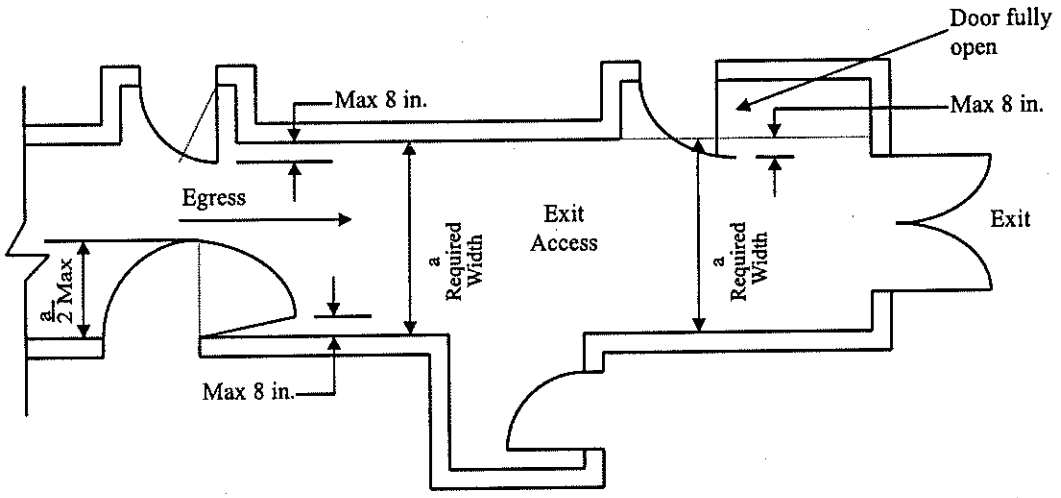
The force required to set the door in motion should not exceed 30 lbf (222 N). In limited instances, the department may accept 50 lbf.

Question: *How does someone determine when a door swing blocks the path of egress?*

Answer: *The following diagram should be utilized to determine the appropriate swing of a door and approximately how much a door can infringe on the path of egress, including stair landings.*

Doors that swing 180 degrees to come to rest against a wall provide the best arrangement for clear passage in an exit access corridor. A door swinging 90 degrees against the path of travel is

considered to partially block an exit access if more than 8 inches of the required width of the corridor remains obstructed.



Note: If the door is required to be barrier free, an 18"-24" clear space is required on the knob side.

(3) (a) A standard exit door shall have such fastenings or hardware that it can be opened from the inside by pushing against a single bar or plate or turning a single knob or handle. The latch or other approved fastening device on the door shall be of an obvious method in its release. Except as provided in pars. (b) to (d), the installation of hardware requiring use of a key for opening an exit door from the inside is prohibited. The requirements of this subsection, except par. (g) shall apply to all buildings in existence and to any building built after the effective date of this subsection.

In addition to exempting (g) from the retroactivity provisions, the department will not apply (h), relating to panic hardware, retroactively.

(b) Exit and exit access doors serving individual living units may be provided with hardware requiring the use of a key for opening from the inside.

Question: *May a hotel unit door have dead bolts or other devices for security purposes? If a security device is allowed, must it be interconnected with the door hardware in such a manner that a single turn also releases the security device?*

Answer: *To satisfy the intent of the 51.15 (3)(b) exception to allow security measures in living units, the department will allow the use of security devices. These security devices are not required to be interconnected with the door exit hardware providing the fastening device has an obvious, easily attainable method of release.*

(c) Upon written request to the department by the owner, key-locking or securing of exits may be approved in fire-resistive buildings, or parts of fire-resistive buildings, which are used as jails, prisons, mental institutions, asylums, nursing homes with senile patients, and similar type occupancies which were constructed prior to January 1, 1982.

Question: *Section 58.20 appears to be more restrictive than 51.15 (3)(c) when concerning the securing of exits in hospitals and nursing homes. Which requirement must be used for Chapter 58 applications?*

Answer: *The exception (to allow the securing of exits) in 51.15 has been in place in one form or another since 1973, long before the creation of Chapter 58. The exception and notes in 51.15 were intended to provide the guidelines for allowing the securing of exits as well as to identify the need for a written approval by the department. The notes also attempted to cross reference several of the requirements of the licensing agency when hospitals and nursing homes are involved.*

The differences within the rules of the Dept. of Commerce and DHFS created the need for a separate code (CH. 58) which went into effect in 1982. That occupancy chapter included the most current requirements related to health care and detention facilities, including all requirements related to buildings which have secured exits.

This requirement is not intended to be retroactive. Therefore, it was not intended that the requirement of 58.20 be applied to existing jails, hospitals, and nursing homes constructed prior to 1982.

The provisions of 51.15 (3)(c) will apply to all jails, hospitals and nursing homes constructed prior to January 1, 1982. Facilities constructed on or after January 1, 1982, are required to meet the needs outlined in s. COMM 58.20.

Note 1: This code paragraph applies only to buildings constructed prior to 1982. Refer to ch. COMM 58 for buildings constructed after 1981.

Note 2: The owners request should include the following considerations: accessibility of keys to the fire department and staff personnel for the locked areas; electrical devices which release the locks; and 24-hour supervision of the locked areas by personnel who carry keys for the locked areas while on duty. Electrical devices which release the locks upon power failure or upon activation of the fire alarm or sprinkler system or the product of combustion detectors should be considered for securing of exits in nursing homes.

Note 3: Written approval to lock exits must also be obtained from the department of health and social services in accordance with the rules of that department.

(d) 1. One door serving as an exit from any building housing any office or wholesale or retail store may be equipped with hardware which requires use of a key to open it from the inside provided one of the following conditions is satisfied:

Only one door *in the building may be equipped with a key lock from the inside and the* ***occupancy*** *of the building* ***is restricted*** *to office, wholesale or retail stores. This exception does not extend to all occupancies under the scope of Chapter COMM 54. This exception may not be used for taverns, for restaurants, or any other occupancy except office, wholesale or retail stores.*

a. The door has a window which has a minimum clear opening of not less than 24 inches, and 6 square feet in area with the bottom of the window opening not more than 4 feet above the inside floor level;

If a window within 5 feet of the door is provided to satisfy this requirement, that window must be accessible from the door. The window may not be in an adjoining room separated from the door by a partition.

b. A glazed sidelight satisfying the dimensional and location requirements for the windows specified in par. (a) is located adjacent to the door; or

c. A window satisfying the dimensional and location requirements for the window specified in par. (a) is located within five feet of the door.

2. Approved safety glazing shall be used in all installations but the glazing may not be bullet-resistant or break-resistant.

3. The door may not be used as an exit serving any required exit stairway enclosure.

4. The door shall not be key-locked during periods of occupancy by the public or employes. A readily visible, permanent sign shall be placed on or adjacent to the door on the egress side stating, "THIS DOOR SHALL NOT BE KEY-LOCKED WHEN THE BUILDING IS OCCUPIED." The sign shall be in letters at least one inch in height on a contrasting background.

5. The use of keyed hardware as specified in this section may be revoked by the department or its authorized deputy upon one violation of any of the conditions specified in subds. 1. to 4.

(e) 1. Except as provided in subd 2., the door shall not be barred, bolted or chained at any time.

2. When authorized persons, such as employes, frequenters, patrons and other such occupants are not present, the exit door may be secured by the use of a single bar or bolt. A sign or label shall be posted on the door near the single bar or bolt. The sign or label shall bear the following: "This bolt or bar shall be kept open during periods of occupancy."

The door may not be key locked during periods of occupancy by public or employees. This means that the door will be locked by the last employee to leave in the evening and will be unlocked by the first employee to arrive in the morning. The key locking aspect cannot be employed at the close of the business day if employees or cleaning personnel are still in the building.

Note: The intent of subd. 2. is to prohibit padlocks or use of a key to open a door or lock at any time. The bar and bolt exception is to give security against intruders from the outside while protecting persons in the building from being trapped.

(f) 1. Except as provided in subd. 2, in a building protected throughout by either a supervised automatic fire sprinkler system or a supervised automatic fire detection system, the exit doors may be equipped with listed, locking devices which shall:

a. Release or unlock upon activation of the sprinkler system or fire detection system;

b. Release or unlock upon the loss of power to the locking device;

c. Release or unlock within 15 seconds whenever a force of not more than 15 pounds of force is continuously applied to the release device for a period of not more than 3 seconds;

d. Upon the release or unlocking of the door activate an audible alarm in the vicinity of the door;

e. Require the manual relocking of such doors; and

f. Have a sign adjacent to the locking device indicating how the door may be opened.

2. The use of locking devices as described in subd. 1 shall be limited to the following restrictions.

a. The locking device may not be employed on any door of an occupancy designated or licensed as a community based residential facility.

See DHSS 83.02 (3) and 83.54 (2) and (3) for more strict requirements.

b. The locking devices may not be employed on any doors serving as the main entrance/exit of an assembly hall occupancy regulated under ch. COMM 55.

c. Not more than one locking device may be employed in any egress path within a health care facility regulated under ch. COMM 58, subch. I.

(g) 1. Except as provided in subd. 2., the latch or other approved fastening device shall be located on the exit door so that the device is not less than 32 inches or more than 54 inches above the floor level.

2. The latch or approved fastening device on solid tempered glass doors may be located on the door at the floor line.

(h) Any door in a required means of egress serving an area or areas having an occupant load of 100 or more persons shall be provided with panic hardware. Acceptable panic hardware shall be a door latching assembly which complies with subds. 1. to 3.

*Note that the requirement for panic hardware is based on the capacity of the **area**. Dividing the capacity by the number of exits to justify less than 100 people per door **does not** eliminate the need for panic hardware.*

1. The assembly shall cause the door latch to release and the door leaf to open, when a force of 15 pounds and greater is applied in the direction of egress, to a bar or panel.

2. The activating portion of the bar or panel in par. (a) shall extend not less than one-half the width of the door leaf, and shall be mounted at a height of at least 30 inches but no more than 44 inches above the floor.

3. The force specified in par. (a) shall be applied at the latch side of the door.

Question: *COMM 51.15 (3)(h) specifies that any door serving an area with an occupant load of 100 people or more shall be provided with panic hardware. May a door without a latching device be used without panic hardware?*

Analysis: *In a panic situation with a rush of people trying to exit in a hurry, the typical door unlatching devices such as door knobs or levers may cause sufficient delay so as to create a crush at the door, thereby preventing the operation of the unlatching device. The intent of this code section is to require a pressure release of the door in the direction of egress. Doors without any latching devices allow the pressure release of the door; therefore, no additional panic hardware is required.*

Answer: *Yes. Panic hardware is not required on doors without latching devices and which will swing in the direction of egress when a 30-pound or less force is applied.*

Note: Barrier-free requirements may mandate a lesser force be applied to the door to set it in motion.

Question: *May thumbscrew locking devices be applied to doors required to have panic hardware or doors without latching devices utilized to comply with COMM 51.15 (3)(h)?*

Analysis: *The intent of the panic hardware requirement is to assure that the exit doors release in the exit direction when a force is applied to the door, panel, or panic hardware bar when 100 or*

more people are in the building. Therefore, no locking device may be activated when 100 or more people are in the building.

COMM 51.15 (3)(a) allows the use of hardware that can open the door by pushing against a bar or plate or turning a single knob or handle when the building is occupied. Thus. when the building is occupied, a thumbscrew locking device may not be activated on a door with panic hardware since more than a single motion would be required to disengage the two locking devices.

COMM 51.15 (3)(e) 2. allows doors to be secured by a single bar or bolt when employees, frequenters, patrons, and other occupants are not present. Thus, when the last employee leaves the building, an additional bar or bolt may secure the exits.

***Answer:** Thumbscrew locking devices may be applied to doors without latching devices providing such locking devices are not activated when 100 or more people are in the building. Thumbscrew locking devices may be applied to doors which have panic hardware; however, the thumbscrew may not be activated until the last occupant is leaving the building.*

(4) A standard exit door shall not be less than 6 feet 4 inches high by 3 feet 0 inches wide, except where especially provided under occupancy classifications and in s. COMM 51.20. Where double doors are provided with or without mullions, the width of each single door may be reduced to 2 feet 6 inches, except double doors utilized to provide accessibility in accordance with s. COMM 52.04 shall have the width of at least one single door increased to 2 feet 8 inches.

The basic requirements for an exit or exit access door are that the door be at least 36 inches wide by 6 feet 4 inches high; the door swing in the direction of egress; it be equipped with hardware which can be opened from the inside by a single action; that the door knob or handle be located between 32 inches and 54 inches above the floor; and that the door be marked with an exit light. There are exceptions to these requirements elsewhere in this section and in the occupancy chapters of the code.

(5) (a) All exit doors, unless otherwise exempted by the occupancy requirements of this code, shall be identified by illuminated translucent exit signs.

1. An exit sign shall bear the words "EXIT" or "OUT."

2. The wording for the exit sign shall be of letters not less than 6 inches high with principal strokes of letters not less than 3/4 inches wide.

3. The wording for the exit sign shall be of red or green lettering on a contrasting background.

4. A self-luminous type of exit sign which provides evenly illuminated letters shall have a minimum luminance of 0.06 foot lamberts; other types of exit signs shall be illuminated by a source providing not less than 5 foot-candles at the illuminated surface.

No exception is made to allow these exit lights to be turned off when the building is unoccupied; thus the exit sign must be illuminated at all times. See s. Comm 16.46 for when emergency power is required.

(b) When exit doors are not readily visible to occupants, directional exit signs shall be provided in exit access corridors and other appropriate locations so to indicate the direction and way of egress.

Exit lights are intended to serve two functions:

1. Direct the occupant to the correct exit door when more than one choice of doors is available.

2. To provide visible direction to exits in case of poor lighting, presence of smoke, etc.

Onsite judgment is needed to determine actual placement for best visibility, therefore the acceptance of directional light placement is left to the inspector's judgment.

(6) (a) The required aggregate width of exits from a level shall be determined by using the full occupant load of that level, plus the percentage effects of the occupant loads of adjacent levels (above and below) which exit through it as follows:

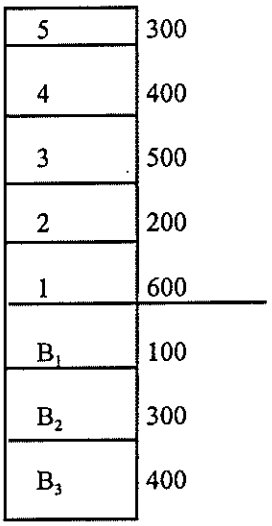
1. 50% of the occupant load of each first-adjacent level; and
2. 25% of the occupant load of each second-adjacent level.

(b) The width shall be based upon the following ratios:

1. Types No. 1 through No. 4 construction unsprinklered, 40 inches per 100 persons;
2. Types No. 5 through No. 8 construction unsprinklered, 50 inches per 100 persons;
3. Types No. 1 through No. 4 construction sprinklered, 30 inches per 100 persons; or
4. Types No. 5 through No. 8 construction sprinklered, 40 inches per 100 persons.

Note: The determination of exit width for health care facilities is specified in s. COMM 58.12 (2) and (3) and takes precedence over this section.

51.15 (6) EXAMPLE TO DETERMINE TOTAL AGGREGATE EXIT WIDTH.



Type No. 1 sprinklered construction

Aggregate exit width required from a floor into the stairwell is 30 inches per 100 people on that floor; i.e.,

5th floor to stairwell = 3 x 30 = 90"

4th floor to stairwell = 4 x 30 = 120"

3rd floor to stairwell = 5 x 30 = 150"

etc.

Total stair width required:

5th to 4th: 300 persons (100%) x 30"/100 persons = 90"

4th to 3rd: [400 persons (100%) + 300 persons (50%)] 30"/100 persons = 165"

3rd to 2nd: [500 persons (100%) + 400 persons (50%) + 300 persons (25%)] 30"/100 persons = 232.5"

2nd to 1st: [200 persons (100%) + 500 persons (50%) + 400 persons (25%)] 30"/100 persons = 165"

(Use 232.5" so no narrowing)

1st to exterior: [600 persons (100%) + (200 persons + 100 persons) (50%) + (500 persons + 300 persons) (25%)]

(from above and below) X 30"/100 persons = 285"

B_1 to 1st - [100 persons (100%) + 300 persons (50%) + 400 persons (25%)] 30"/100 persons = 105"

(Use 150" so no narrowing)

B_2 to B_1 - [300 persons (100%) + 400 persons (50%)] 30"/100 persons = 150"

B_3 to B_2 - 400 persons (100%) x 30"/100 persons = 120"

When determining the required aggregate exit width, first calculate the aggregate width of the exit access doors from rooms. Next calculate the required width of the corridors. The next calculations will be to determine the aggregate width of the doors leading to the stairways. The foregoing calculations should be made for each level of the building. The required aggregate width of the stairways is next determined starting at the uppermost floor and proceeding to the floor of exit discharge; and beginning with the lowest floor below an exit discharge and proceeding to the floor of exit discharge. The size of the exit door leading from the stair enclosure to the exterior cannot be smaller than the sum of the two exit widths determined coming from above and below plus the width required based on the occupancy of the floor of exit discharge.

Question: *Where a stairway from an upper level goes directly to the outside but a required exit from the first floor exits via the stairway landing, how is the required width of the exterior doors calculated?*

Analysis: *The width must be determined or calculated on the basis of the number of people on the floor of exit discharge coupled with the number of people on the two adjacent floors above and below the floor of exit discharge. The width of the door from the stair enclosure to the outside cannot be based only on the widths of the stairs and doors leading to the landing at exit discharge level.*

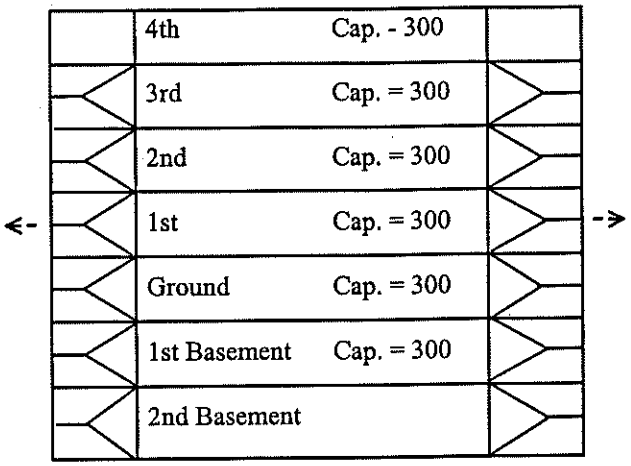
Answer: *COMM 51.15 (6) allows a method of calculating the number of people at a discharge point assuming the full occupant load from above and below will not reach that point at the same time. Two additional requirements must be kept in mind when doing aggregate exit width calculations:*

1. ***Once a width has been determined in an exit path, the width may not be decreased further on, even though the calculation may indicate a lesser width.*** *For instance, if 100 inches is calculated as the stair width from eighth floor to seventh, and 60 inches is calculated from seventh floor to sixth, the 100-inch width must be maintained, as a minimum, all the way to the outside.*

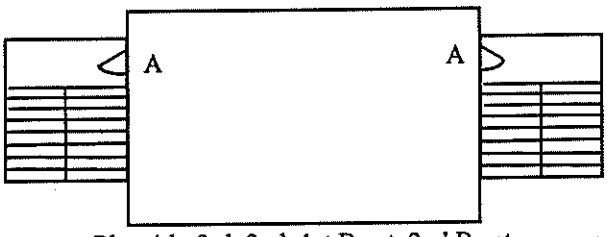
2. Exit distance requires that the exiting occupants be distributed proportionally among the exits. For instance, a floor level has an exit directly to grade, serving only that floor, and two exits through stair landings, and the width of the exit to grade is sufficient to meet the entire aggregate width requirement. For purposes of determining width of doors from the stair to the outside, a proportion of the first floor occupants, based on proportion of width provided, must be considered as using the stair exits even though the direct exit out is capable of handling the entire occupant load. CAUTION: The proportional distribution may change based on partition and room layouts.

See an example below which incorporates most of the complexity usually associated with this evaluation.

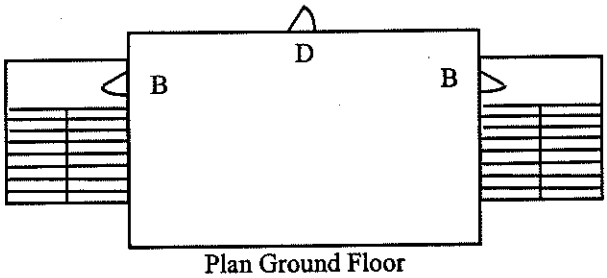
Example:



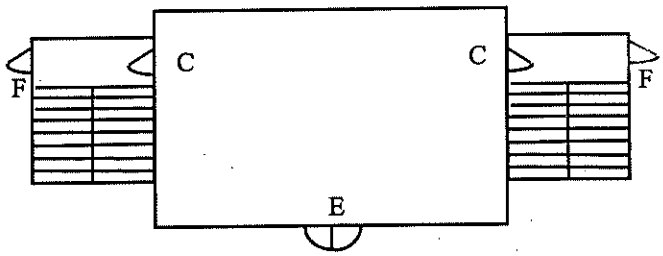
Consider a four-story building with a ground floor and two basements. All exits are at the first floor. The building has two stairways of equal size. The first story exits via a main exit with a pair of doors and via the first floor landings of the stairs. The ground floor exits via a single door to the outside and via the two stairs. All floors have capacity of 300 persons, and the required exit width is 40 inches/ 100 persons.



Plan 4th, 3rd, 2nd, 1st Bsmt, 2nd Bsmt



Plan Ground Floor



Plan First Story

STEP 1 Determine required widths into the stair.

1. Determine width of Door "A" from 4th, 3rd, 2nd bsmt. and 1st bsmt. levels into the stairway. (These are identically exited floors.) Aggregate width from each floor = 300/100 X 40 = 120" Each Door "A" must be 60 inches wide.

STEP 2. Determine the stairway widths required to the floor of exit discharge.

a. Calculate G = Stairs from 4th to 1st story.

1. Aggregate width from 4th to 3rd floor = 300/100 X 40 = 120".

Each Stair "G" must be 60 inches wide.

2. Determine width of Stair "G" from 3rd to 2nd floor. Aggregate width is based on 50% of 4th floor (300 X .50 = 150) + 100% of 3rd floor (300), or 450.

450/100 X 40 = 180". Each stair from here to discharge must be at least 90 inches wide.

3. Determine width of Stair "G" from 2nd to 1st floor.

Aggregate width is based on 25% of 4th floor (300 X .25 = 75) + 50% of 3rd floor (300 X .50 = 150) + 100 % of 2nd floor (300), or 525. 525/100 X 40 = 210".

Each stair from here to discharge must be 105 inches wide.

b. Calculate H = stairs from 2nd basement to first story.

1. Determine width of Stair "H" from 2nd bsmt. to 1st bsmt. Aggregate width from 2nd to 1st bsmt. = 300/100 X 40 = 120". Each Stair "G" must be 60 inches wide.

2. Determine width of Stair "H" from 2nd bsmt. to ground floor. Aggregate width is based on 50% of 2nd bsmt. (300 X .50 = 150) + 100% of 1st bsmt. (300), or 450. 450/100 X 40 = 180". Each stair from here to discharge must be 90 inches wide.

3. Determine width of Door "B" from ground floor to stair. Three door panels are provided for exiting from this floor, one to the outside and two to the stairs. Therefore, 2/3 of the people will use the stairs. Effective occupant load for the stairs is 2/3 X 300 = 200. 200/100 X 40 = 80". Each Door "B" must be 40 inches wide. Door "D" would also have to be 40 inches wide.

4. Determine width of Stair "H" from ground floor to 1st floor. Aggregate width is based on 25% of 2nd bsmt. (300 X .25 = 75) + 50% of 1st bsmt. (300 X .50 = 150) + 100% of ground floor occupants ***using the stairs*** *(200) = 425. 425/100 X 40 = 170". This calculation requires each Stair "H" from ground floor to 1st must be 85 inches wide; however, the calculation in 2. above would require the stairs to be 90 inches wide.*

STEP 3 Determine exit width required from 1st floor.

Determine width of Door "C" from 1st floor to the stairs. This floor is exited via four door panels, two to the outside and two to the stairs. Therefore, 1/2 of the occupants use the stairs, or 150 occupants. The width is 150/100 X 40 = 60". Required width at each Door "C" is 30". The minimum door size by code is 36 inches, however, so Door "C" must be 36 inches wide. In this case, the doors at Exit "E" would have to provide at least 60 inches of total width.

STEP 4 Evaluate data from Steps 1, 2, and 3 to determine exterior widths required.

a. Determine the width of Door "F". Aggregate width is based on 25% of 3rd story (300 X .25 = 75) + 50% of 2nd story (300 X .50 = 150) + 25% of 1st bsmt. (300 X .25 = 75) + 50% of the ground floor ***using the stairs*** *(200 X .50 = 100) + 100% of the 1st story* ***using the stair*** *exits (150) = 550. The aggregate width of Door "F" is 500/100 X 40 = 220". Each Door "F" must be 110 inches wide.*

b. Compare the calculated width of Door "F" to the width of Door "C", Stair "G" and Stair "H". The width of Door "F" must not be less than Door "C", Stair "G" or Stair "H".

(c) The required aggregate width of exits from assembly seating facilities shall comply with the requirements of s. COMM 62.75 (4).

This section only applies to exiting from the seating area. Exiting from the room or building must comply with (a) and (b).

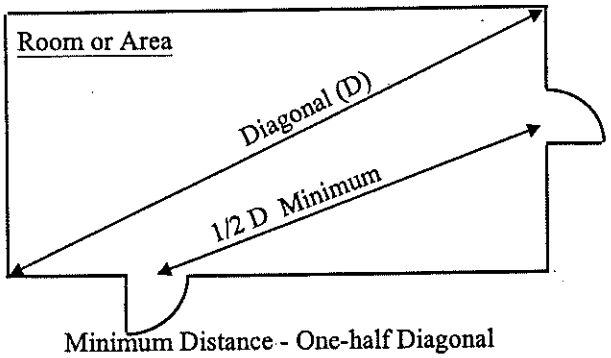
COMM 51.151 EXIT DISTRIBUTION.

All spaces which can accommodate more than 25 persons shall be provided with a minimum of 2 exits, 2 exit access doors or a combination of both which are located to provide the best possible egress from the room or suite. If exit access doors are used, the exit access corridors shall lead to 2 or more separate exits.

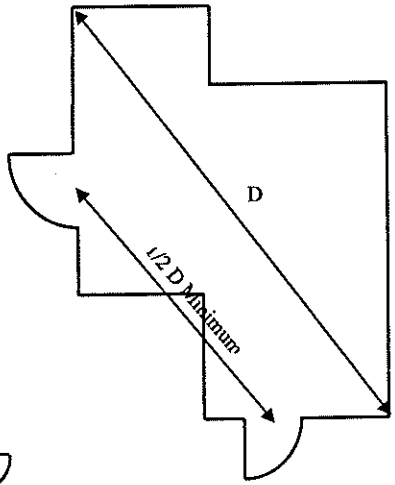
This section requires that any room or space which has a capacity of more than 25 persons must have at least two exits or exit accesses. Exits and/or exit accesses must be spaced at least 20 feet apart or spaced a distance equal to one-half the diagonal measurement of the area or room being exited. The spacing of the exits is a guideline only, however, failure to properly distribute exits will be considered a code violation by staff as a failure to provide the best possible egress.

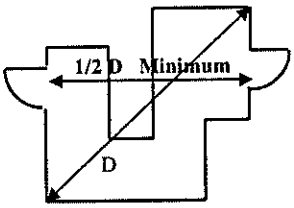
Note 1: See occupancy chs. COMM 54 to 62 for acceptable types of exits and exit accesses and exceptions.

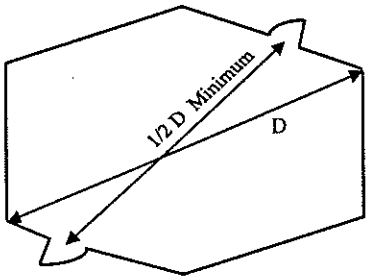
51.151 Exit Distribution. The following diagrams are provided to aid in the determination of proper exit distribution.

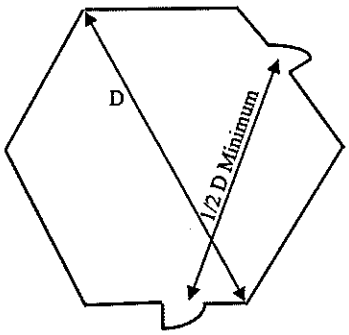


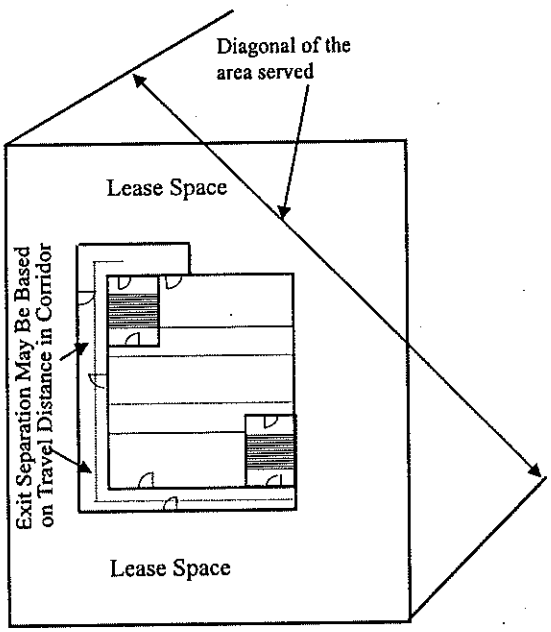
Minimum Distance - One-half Diagonal

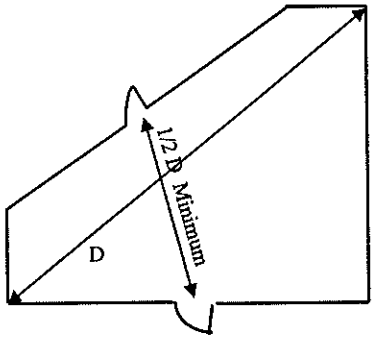




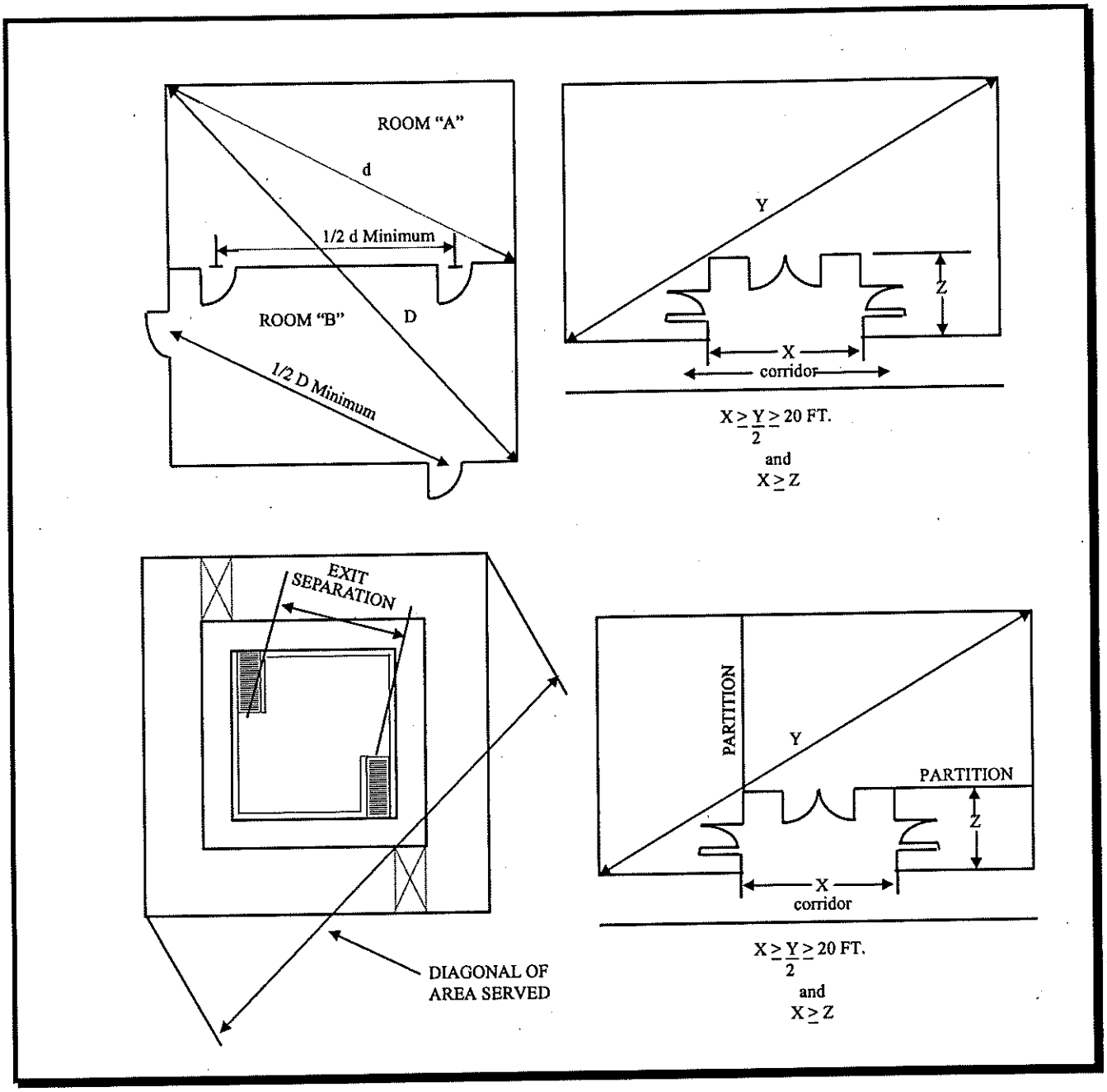








(Not to scale.)



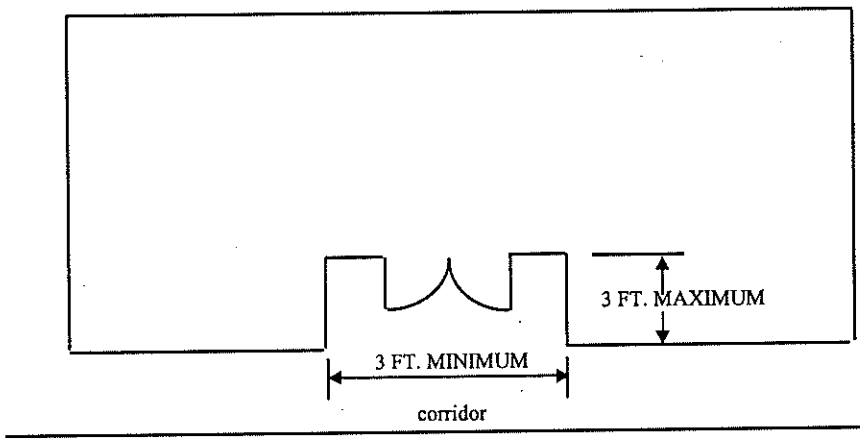
COMM 51.152 EGRESS CONFIGURATION.

(1) EGRESS DIRECTIONS.

(a) Where 2 directions of egress are required, and are provided by doors opening into corridors, the angle between the 2 directions shall not be less than 90°.

(b) An angle between directions of egress within a space shall be satisfactory providing passageways are maintained to corridor access points separated a distance of at least one-half of the diagonal of the area served, or 20 feet, whichever is greater.

(2) RECESSED DOORS. Where 2 directions of egress are required, and are provided by recessed doors opening into the corridors, the doors shall be recessed no more than 3 feet into an alcove serving only that exit access, and the alcove width shall be at least 3 feet.



COMM 51.16 STAIRWAYS AND RAMPS.

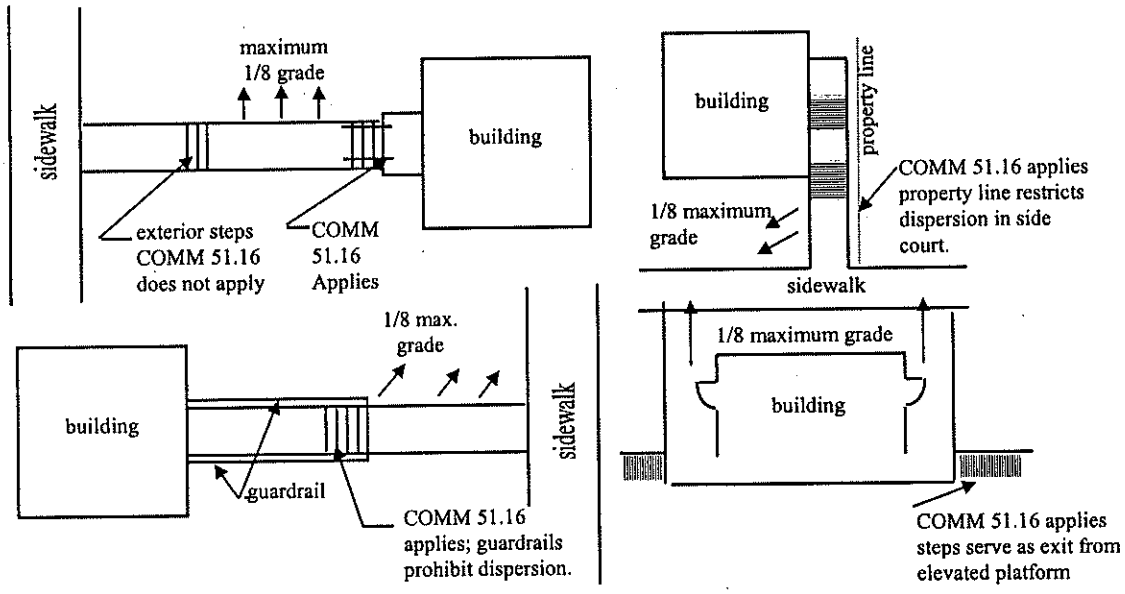
(1) DEFINITIONS.

(a) "*Stairway*" means one or more flights of steps, and the necessary platforms or landings connecting them, to form a continuous passage from one elevation to another, including exterior porches, platforms and steps.

Question: *Do the COMM 51.16 stairway requirements apply to exterior stairs?*

Answer: *The code does not apply once a person has exited the building and reached a point where it is possible to disperse on grade in at least two directions. For exiting purposes, a maximum slope is 1:8 (maximum permitted ramp slope) has been acceptable. Obstructions such as guardrails and steep terrain and property lines are considered restrictions to dispersion.*

COMM 51.16 requirements apply within the building and extend outside of the building to a point where a minimum of two directions of travel onto grade with a maximum 1:8 slope have been provided. See the following illustrations.



(b) "*Ramp*" means a sloping floor or walk and necessary platforms or landings connecting them to form a continuous passage from one elevation to another.

(2) REQUIRED AGGREGATE WIDTH.

(a) The required aggregate width of stairway or ramp exits from any level shall be as specified in s. COMM 51.15 (6).

(b) In no case shall the minimum width of an exit stair or ramp be less than that specified in sub. (3).

(c) Under no circumstances shall stairways or ramps decrease in width in the line of travel toward the exit.

Where calculations indicate different required widths, the wider width must be maintained from the point where that width is required to the exterior of the building. The required width of a stairway may not decrease in width.

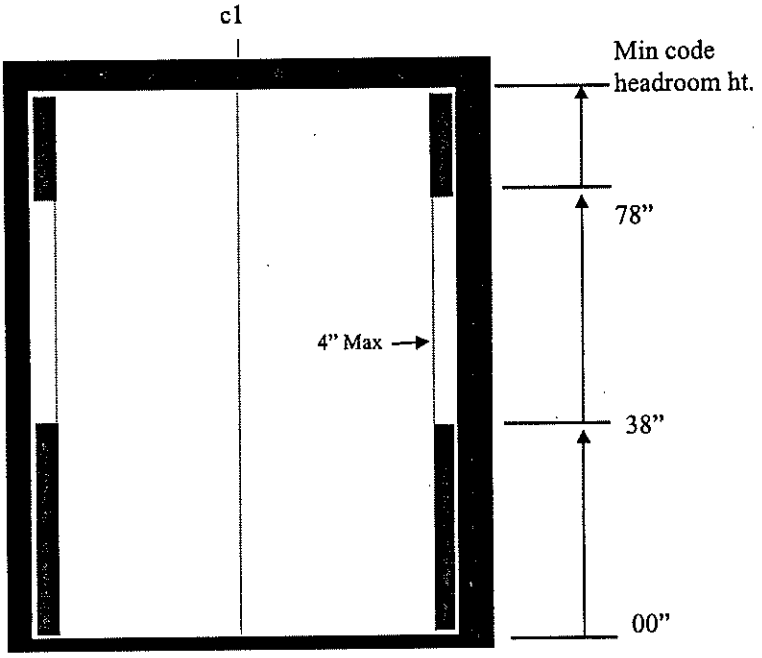
(3) MINIMUM WIDTH.

(a) Except as provided in pars. (b) and (c), every required exit stairway or ramp under chs. COMM 54 to 62 shall be not less than 3 feet 8 inches wide, except as provided in the occupancy chapters, of which not more than 4 inches on each side may be occupied by a handrail. The clear dimension between handrails, or stringers, shall not be less than 3 feet 0 inches.

Question: *What encroachments, if any, are allowed into this width requirements cited throughout the code?*

Answer: *Required widths for egress components (stairs, ramps, corridors, and passageways) may be encroached upon, up to 4 inches on each side, below handrail height and above headroom height. (See attached drawing for illustration of encroachment zones.) Be aware that where specific limitations or restrictions exist within the code which are more restrictive than cited here [such as but not limited to s. COMM 57.09 (2) and 58.12 (2)(b) 3.], the more restrictive shall apply. Also COMM 69.11 ADAAG 4.3.11.3 requires a 48-inch minimum clear width for stairways serving areas of rescue assistance. COMM 69.28 also has minimum width requirements when lifts are installed in stairways.*

EGRESS WIDTH REQUIREMENTS



Note: A 1-inch encroachment by trim around door and window openings is acceptable.	*Required width* *≥ 8'-0" Corridors in hospitals and nursing homes.* *≥ 4'-0" Corridors in places of instruction.* *≥ 3'-8" Stairs/corridors other occupancies.* *≥ 3' if serving ≤ 25 persons*	*Allowable zones of encroachment shown* *Allowances are symmetrical about centerline* *Encroachments may be on one side or both sides of the required egressway.*

* See 51.164 and occupancy chapters for more stringent headroom requirements.

Note: See COMM 51.15(6) and 58.12 for width increases requirements per occupant loads.

Note: See sections 51.07, 57.09, 54.07, 54.03, 51.16, 59.13, 60.33, and 61.12 for allowable decreases in width.

(b) Nonrequired stairways or ramps need not conform to the width requirements specified in chs. COMM 50 to 64.

(c) A required stairway or ramp serving a space with an occupant load not greater than 25 persons shall have a width of not less than 3 feet.

(4) RISERS, TREADS AND RAMP SLOPES. Risers and treads shall be designed and provided in accordance with the following:

(a) 1. Except as provided in subd. 2., all stairways and steps shall have a rise of not more than 7 inches measured from tread to tread and a tread of not less than 11 inches, measured from nosing to nosing of tread. The slope of a tread shall not exceed 1/4 inch per foot for

the depth of the tread. Treads and risers shall be uniform in any one flight. Winders may not be used.

2. Existing stairways and steps in existing buildings, where a change in occupancy is occurring, may remain in use if they were constructed in accord with the requirements of this code relating to the proposed occupancy, that were in effect at the time of that construction.

See COMM 62.76 (6) for sloped assembly seating requirements.

A stairway flight is the risers and treads between floor levels, between landings, or between a floor level and a landing. The risers and treads must be uniform in any stairway flight. If it is desired to change riser heights or tread dimensions or both, a landing must be provided between the differing flights. A landing must be at least 36 inches long in the direction of travel.

Escalators may not be used as required exit stairs as they do not have uniform risers. The riser height normally exceeds that permitted by code and typically are not enclosed to the outside.

Note #1: The department recommends that steps be proportioned so the sum of 2 risers and a tread, exclusive of its nosing or projection, should be not less than 24 inches or more than 25 inches.

Note #2: The department may accept nonstandard exit stairways serving unoccupied areas, such as equipment mezzanines or platforms, and similar areas, if approved in writing.

Note 2 under this section allows nonstandard stairways and landings to equipment mezzanines or platforms. This exception does not apply to a platform or mezzanine used for storage. It only applies to equipment platforms and if the platform is significantly larger than required to accommodate the equipment, the department will consider the area as storage requiring one or more standard exit stairs. Designers and owners are reminded that the stair and ladder requirements of the Occupational Safety and Health Administration, United Stated Department of Labor (OSHA), will apply to the means of access to the equipment platform or mezzanine.

OSHA 1910.24 Table D-1 below gives rise/tread dimensions which will provide a stairway within the permissible OSHA range.

TABLE D-1

(This is Commentary Material)

Angle to Horizontal	Rise (in inches)	Tread run (in inches)
30°35'	6 1/2	11
32°08'	6 3/4	10 3/4
33°41'	7	10 1/2
35°16'	7 1/4	10 1/4
36°52'	7 1/2	10
38°29'	7 3/4	9 3/4
40°08'	8	9 1/2
41°44'	8 1/4	9 1/4
43°44'	8 1/2	9
45°00'	8 3/4	8 3/4
46°38'	9	8 1/2
48°16'	9 1/4	8 1/4
49°54'	9 1/2	8

Note 3: See chs. COMM 66 and 69 for additional requirements for stairways.

(b) The edges of all treads and the edges of all stairway landings shall be finished with a nonslippery surface not less than 3 inches in width;

(c) Where an exit door leads to an outside platform or sidewalk, the level of the platform or sidewalk shall not be more than 7 3/4 inches below the door sill;

(d) Every stairway flight shall have at least 3 risers, except as provided in par. (c) and ss. COMM 54.03 (1) (b), 55.09 (3) and 57.07 (1); and

Less than three risers. Where the total change in floor elevation is less than 15 inches, providing three risers may result in adverse or inconvenient stair conditions. Providing one or two steps may be the only alternative where space limitations or other conditions preclude the use of a ramp.

Acceptance for one or two risers will be limited to occupancies other than Chapter COMM 55 and to areas within places of assembly where it is obvious that the steps will not be used as a means of egress for more than 100 persons, (raised or depressed areas in restaurants and lounges or for bowling and other recreational activities area acceptable locations). For places of assembly where the exitway serves an area accommodating more than 400, a ramp is required in accordance with COMM 55.08 (2).

1. Adequate lighting must be provided. If the general level of illumination is 10 foot-candles or more, measured at the floor, no additional lighting is required. Supplementary lighting may be located overhead, above the steps or at the floor level. For restaurants, theaters and other areas where the illumination level is low, the supplementary lighting may be reduced to not less than 5 foot-candles if sufficient contrast is still provided at the steps.

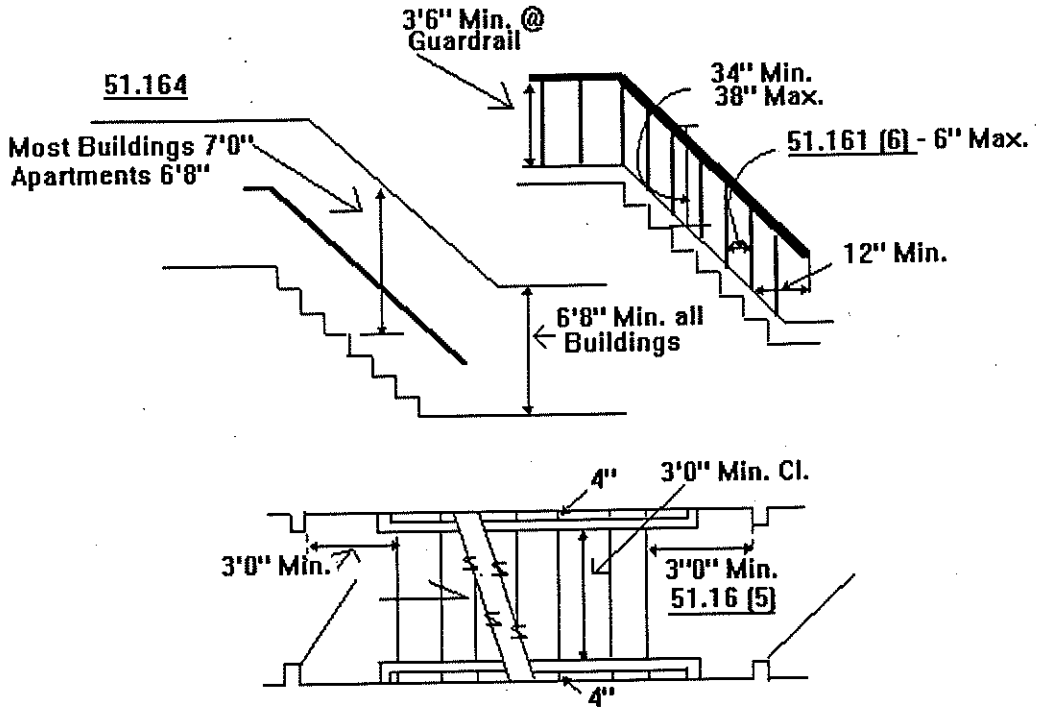
2. The leading edge of the step or tread should be readily apparent to a person approaching the steps from either direction. This may be accomplished by contrasting color, finish or illumination.

3. The rise of any step should be not less than 4 inches.

4. Handrails should be provided at both sides of the steps. The width of the opening between railings or handrails should be not more than 5 feet. It is not necessary to comply with the provisions of COMM 51.151 for handrail extension or intermediate rails.

5. Providing two or more stair platforms, having a uniform dimension of at least 3 feet and not more than 5 feet between risers is an acceptable arrangement wherever stairs are permitted. If the platforms are not uniform or exceed 5 feet in length, each riser should be considered as a single step. A dimension less than 3 feet between risers is considered a stair tread.

(THE FOLLOWING DIAGRAMS ARE COMMENTARY)



(e) There shall be no more than 22 risers in any one flight.

(f) Slopes of ramps located in required means of egress shall comply with ch. COMM 69. Slopes of ramps not located in required means of egress shall not exceed 1 foot of rise in 6 feet of run.

Note: See s. COMM 52.04 (7) for ramp requirements for barrier free design.

(g) Ramps and landings shall be finished with a slip-resistant surface.

The term "slip-resistant" is not defined in the code. Therefore, the slipperiness of a ramp or stair is based upon the judgment of the inspector. Designers, contractors and owners should consider the nap direction of carpeting and the effect of moisture on the stair or landing surface materials.

The Occupational Safety and Health Administration recommends that walking surfaces have a static coefficient of friction of 0.5. A research project sponsored by the Architectural and Transportation Barriers Compliance Board (Access Board) conducted tests with persons with disabilities and concluded that a higher coefficient of friction was needed by such persons. A static coefficient of friction of 0.6 is recommended for accessible routes and 0.8 for ramps.

(5) STAIRWAY AND RAMP LANDINGS AND PLATFORMS.

(a) 1. Except as provided in subd. 2., if a door is provided at the head or foot or both of a stairway or ramp, a landing or platform shall be placed between the door and the stairway or ramp regardless of the direction of swing of the door.

2. Platforms may be omitted for ramps 6 foot or less in length.

See more restrictive COMM 69 requirements for ramps on accessible routes.

(b) Every landing or platform shall be at least as wide as the stairway or ramp, measured at right angles to the direction of travel. Every landing or platform must have a length of at least 3 feet, measured in the direction of travel.

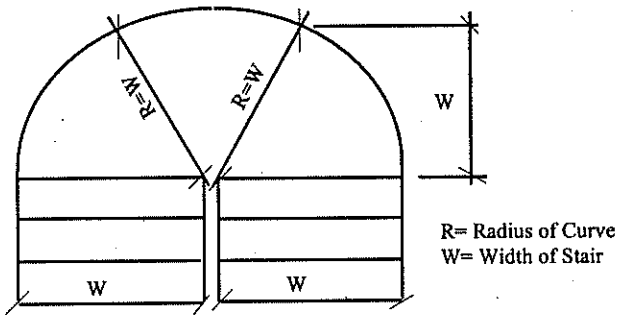
The stairway landings must be at least 36 inches long in the direction of travel and as wide as the stairway. The width of the landing is measured perpendicular to the direction of travel. Landings located where a stairway makes a 90° or 180° turn must have a minimum dimension equal to the width of the larger stairway flight, but in no case, less than 36 inches.

Landings at the head and foot of stairs will be considered part of the stair for purpose of determining spaces beneath the stair. The minimum dimension of the landing shall be 3 feet; whether or not the landing is required per COMM 51.16 (5).

See COMM 69 requirements for landings or platforms on accessible routes.

Question: *Under what circumstances are curve- or semicircular-shaped landings for exit stairways acceptable?*

Answer: *Section COMM 51.16 (5)(b) states that stairway landings shall be at least as wide as the stairway and shall have a length measured in the direction of travel of at least 3 feet. The intent is to ensure that there is no reduction in egress width which may create a "bottleneck" or "choke point" during an emergency situation. The minimum width of a stairway is determined in accordance with s. COMM 51.16 (2) and COMM 51.15 (6), but generally not less than 3 feet 8 inches or 3 feet in specific instances. For curve- or semicircular-shaped landings, the landing radius is the significant dimension and shall be at least equal to the width of the stairway.*



(6) CURVED STAIRS. Interior or exterior curved stairs used as required exits shall meet all the requirements for stairways. Curved stairs shall have a radius of at least 25 feet at the interior edge of the tread.

(7) SPIRAL STAIRS. Spiral stairways may be permitted as specifically allowed by the occupancy chapters of this code. Such spiral stairs shall provide a clear walking area measuring at least 22 inches from the outer edge of the supporting column to the inner edge of the handrail and shall have treads at least 7 inches in width at a point one foot from the narrow end of the tread, and a uniform riser height of not more than 9 1/2 inches.

(8) SPACES BENEATH STAIRS AND RAMPS. Spaces beneath the steps, stairs, ramps, landings and platforms which are within a vertical enclosure under s. COMM 51.02 (11) may not

be used for any other purpose, unless that space is separated from the enclosure by the same degree of fire-resistive construction required for the enclosure.

If a room is placed under a stair which is required to be enclosed with fire rated construction, the room must be separated from the enclosure by construction carrying the same fire rating as the stair enclosure. This will typically require that the stair soffit assembly separating the room from the stairway above be fire rated or the ceiling of the room must carry a finish rating equal to the fire rating required. The door leading to the store room may not open directly to the stair enclosure as COMM 51.18 does not permit such openings directly into the enclosure. The door must open into an area of the building outside of the stair enclosure.

The fire-resistive assembly utilized for stairway protection must be a ***floor/ceiling assembly*** *unless the stairs are greater than 30° from the horizontal.*

(b) Spaces beneath steps, stairs, ramps, landings and platforms which provide a means of egress, but not enclosed under s. COMM 51.02 (11), may not be used for any other purpose, unless;

1. The space is separated from steps, ramps, landings and platforms by at least one-hour fire-resistive construction; or

2. The space and the steps, ramps, landings and platforms are all contained within an individual living unit under the scope of ch. COMM 57.

If the room is placed under a stair which does not require an enclosure, the room must be separated from the stair by construction carrying a rating equal to that required for a stair enclosure based upon class of construction. This will require that the stair/soffit be rated, or the ceiling of the store room must have a finish rating. Because the room must be completely separated from the stair, the walls of the room must also be fire rated.

COMM 51.161 HANDRAILS.

(1) WHERE REQUIRED. Handrails shall be provided in all of the following conditions unless otherwise specified in the occupancy chapters of this code.

(a) On either side for all interior stairways of more than 3 risers and for all ramps overcoming a change in elevation of more than 24 inches.

(b) On the open side of any stairway with more than 3 risers and on the open side of any ramp overcoming a change in elevation of more than 24 inches.

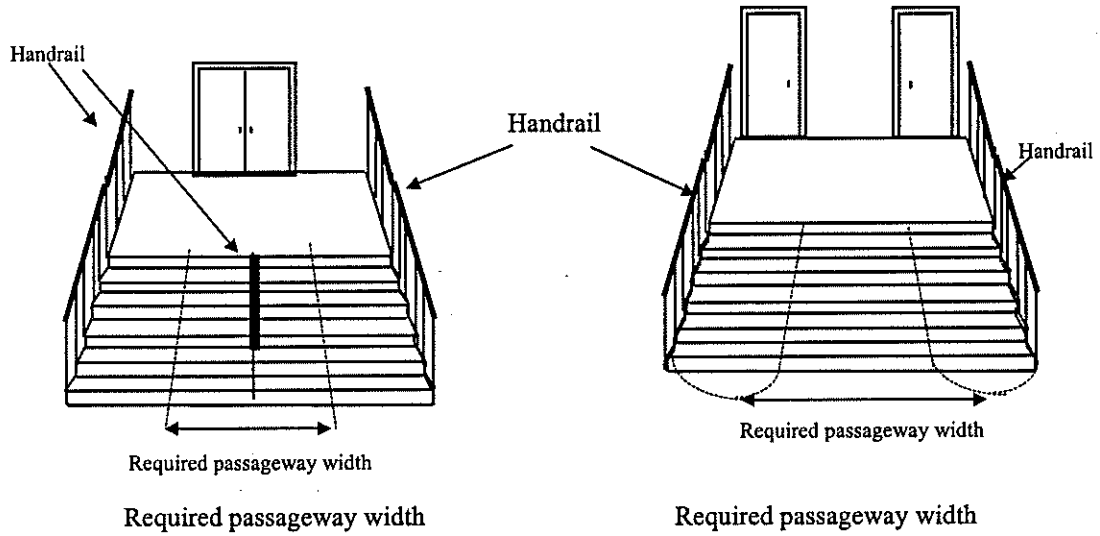
(c) On both sides of interior stairways or ramps 5 feet or more in width.

(d) To divide interior stairways or ramps more than 8 feet wide into widths at least 3 feet 8 inches but less than 8 feet.

(e) On both sides of exterior stairways with more than 3 risers and on both sides of exterior ramps overcoming a change of elevation of more than 24 inches, either of which are an integral part of the building.

(f) To divide exterior stairways or ramps, either of which are an integral part of the building and more than 25 feet wide into approximately equal widths not less than 3 feet 8 inches but not greater than 25 feet.

The Life-Safety Code suggests railings should be placed where they can be utilized in the natural path of travel from exit doors.



(g) The requirements specified in pars. (a) to (f) do not apply to ramps having a slope less than 1:20.

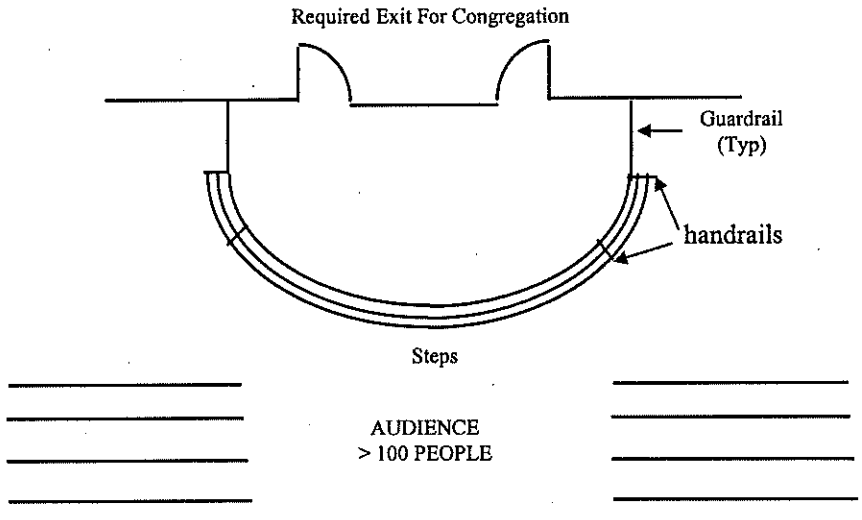
Note: See s. COMM 52.04 (7) (c) for handrail requirements for ramps used to provide barrier free access.

(h) On fire escapes as specified in s. COMM 51.20 (8).

Question: *When are handrails required for church altars?*

Handrails: Consider two situations for handrails.

a. The altar platform is part of an exit path from the rest of the building.



Since the stairs are in an exit path, handrails are required to be installed as per COMM 51.161 (1)(a) & (b) for Chapter 54 (100 or less occupant uses).

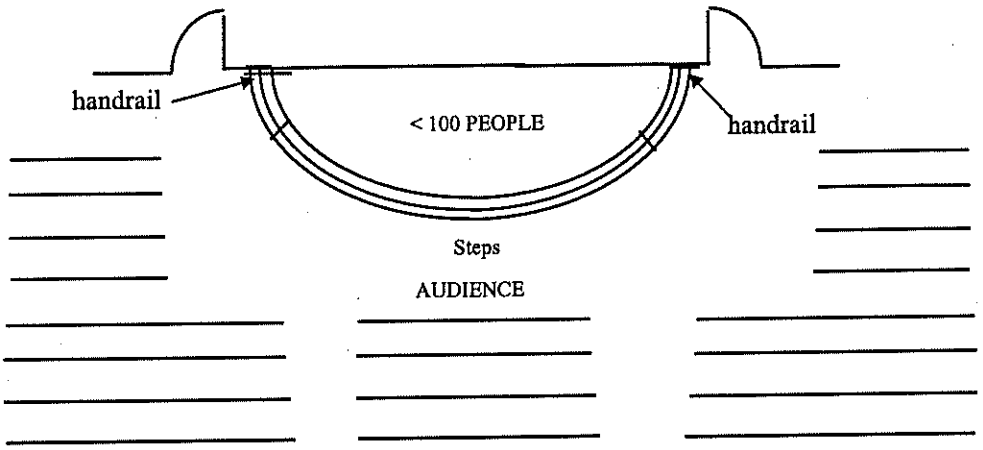
1. On either side for all interior stairways of more than three risers.

2. On the open side of any stairway with more than three risers overcoming a change in elevation of more than 24 inches.

For greater than 100 occupants, COMM 55.09 (2) requires stairways and steps which have more than three risers to have handrails on ***both*** *sides.*

The entire altar step section does not have to be considered stairs. Only the part of the designated exit passageway must satisfy stair requirements; the rest of the steps are decorative stage-type features which the users should be familiar with. Thus the COMM 51.161 (1)(d) requirement to divide altar stairs into sections less than 8 feet wide does ***not*** *apply. Caution: This does not apply to raised or depressed restaurant areas, etc., where the public uses the entire stair area.*

B. The altar platform is not part of an exit path, therefore consideration is exiting from the platform only.



Since the altar is used solely as a raised platform, the number of people observing it are not a safety factor for the altar steps.

Thus an altar with less than 100 people capacity can be considered as a Chapter 54 use for exiting off the altar. See COMM 51.162 commentary for guardrail criteria.

(2) LOADING. All handrails shall be designed and constructed to withstand a load of 200 pounds applied in any direction at any point.

(3) HEIGHT. The top of the handrail gripping surface shall be mounted between 34 inches and 38 inches above the nosing of the treads on stairways or above the surface of ramps.

Note: See s. COMM 51.20 (8) for handrail requirements for fire escapes.

(4) CONTINUITY AND EXTENSIONS.

(a) Except as provided in par. (b), handrails shall be continuous for the full length of the stairway or ramp and one handrail shall extend at least 12 inches beyond the top and bottom riser or ramp end and shall not constitute a projecting hazard.

The handrail must extend 12 inches beyond the top and bottom riser. It need not extend directly in line with the stair and may turn around a corner, such as into a corridor. The extension may be

parallel to the floor or extended in line with the handrail providing the height is between 34 and 38 inches from the floor. The intent of the this rule is to provide a graspable handrail at a location where it can be used before reaching the first riser of the stair.

(b) 1. Handrails not required for barrier-free design construction on assembly seating facilities need not comply with the 12-inch extension requirement.

2. Handrails on stairs located within individual living units need not comply with the requirements of par. (a).

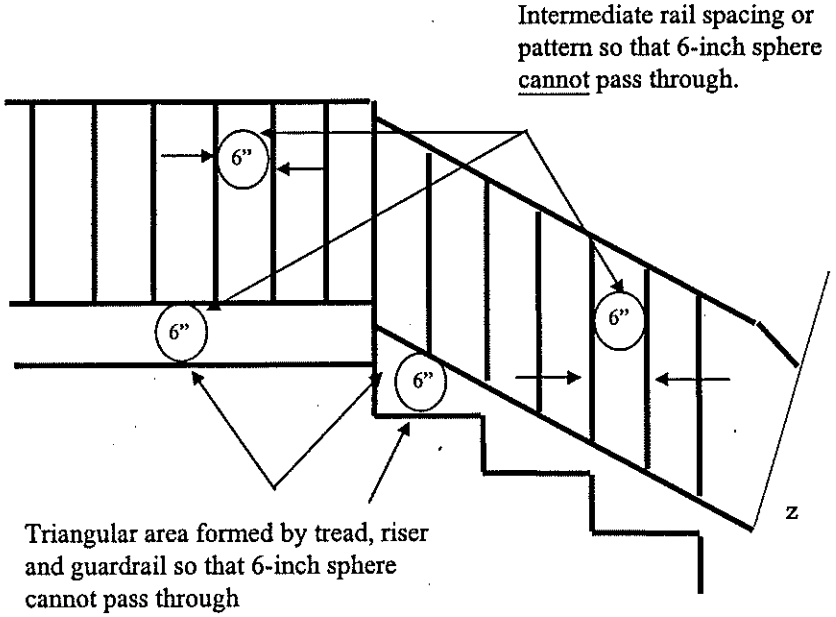
(5) CLEARANCE. Handrails shall provide a clearance of at least 1 1/2 inches between the handrail and the wall to which it is fastened.

(6) OPENINGS BELOW TOP RAIL.

(a) Handrails protecting the open sides of stairways and ramps shall have intermediate rails or an ornamental pattern designed to prevent the passage of an object with a diameter larger than 6 inches, except in adult detention or correctional facilities, factory or warehouse occupancies the clear distance between intermediate rails measured at right angles to the rails may not exceed 21 inches.

(b) Handrails protecting the open sides of stairways and ramps not subject to use by children (i.e., wastewater treatment plants, foundries, tanneries and other industrial occupancies) shall be provided with an intermediate rail at mid height or equivalent.

The intent of this rule is to prevent children from falling through the railing below the top rail. Except for very obvious situations, the department will consider that children may be present in all occupancies due to the possibility of school tours and employees bringing their children to the work place.



(7) HANDRAIL DIMENSIONS. (a) Except as specified in par. (b), handrails serving stairways or ramps shall have a circular cross-section with an outside diameter of at least 1-1/4 inches and not greater than 2 inches. Handrails shall be graspable along the entire length.

(b) Any other shape handrail with a perimeter of at least 4 inches, but not greater than 6-1/4 inches and with the largest cross-sectional dimension not exceeding 2-1/4 inches may be used.

The intent of this section is to provide a handrail which is graspable. Graspability is best achieved when the fingers can curl around the rail to touch the thumb. If a round handrail is utilized, it must have a diameter of at least 1 1/4 inches but not more than 2 inches. If any other shape is used, the graspable portion of the rail must have a perimeter dimension of at least 4 inches but not more than 6 1/4 inches, with the largest cross-sectional dimension of the graspable area limited to not more than 2 1/4 inches. The handgrip portion is the grasping surface to the point where the thumb and fingers curl around and under the rail.

This is not intended to prevent brackets provided at intervals no more than necessary to support the handrail as per COMM 51.161 (2).

COMM 51.162 GUARDRAILS.

(1) WHERE REQUIRED. Guardrails shall be provided in all of the following conditions unless otherwise specified in the occupancy chapters of this code:

It should be noted that the intent of these provisions is to prevent accidental falls, not to address dangers associated with people climbing on the rails.

(a) On the open side of elevated platforms, landings, walks, balconies and mezzanines which are more than 24 inches in height;

(b) On assembly seating facilities as specified in s. COMM 62.77;

(c) On open parking structures as specified in s. COMM 62.28 and as indicated in sub. (5); and

(d) On openings through floors and roofs.

(2) EXEMPT LOCATIONS. Guardrails need not be provided:

(a) On the loading side of loading docks;

(b) On the auditorium side of a stage or enclosed platform; and

Question: *When are guardrails required for church alters?*

Answer: *In the basic concept an altar is a raised platform where a performance is occurring for the benefit of an audience, thus the altars can be considered the same as a stage. COMM 51.162 (2)(b) exempts guardrails on the auditorium side of a stage with the concept that the platform users are familiar with the boundaries of the platform and are focusing their attention to the audience side.*

Where a change in elevation of 24 inches or more occurs on the non-audience side of the platform, the danger of the occupant inadvertently stepping off the platform increases, thus a guardrail is required in those locations.

(c) Around floor pits, openings or depressions for manufacturing areas and processing areas where guardrails would interfere with the operations or functions of the areas.

Note: Federal OSHA also prescribes requirements concerning the guarding of floor openings under 29 CFR 1910.

(3) LOADING.

(a) Except as provided in par. (b), all guardrails shall be designed and constructed to withstand a load of at least 200 pounds applied in any direction at any point.

(b) All guardrails on assembly seating facilities shall be designed and constructed to withstand a vertical and horizontal load of 50 pounds per linear foot. Loads need not be applied simultaneously.

Due to the loading requirements, chains may not be used as guardrails.

(4) HEIGHT. Guardrails shall not be less than 3 feet 6 inches in height.

(a) *Exception.* Guardrails within an individual living unit or on an exterior appurtenance accessible only to the occupant of that unit may be 36 inches in height.

Guardrails on exterior decks and rescue platforms which serve only a single living unit and are accessible only from that unit also qualify for the 36-inch guardrail height.

(b) *Exception.* Guardrails on a balcony immediately in front of the first row of fixed seating and which are not at the end of an aisle may be 30 inches in height.

(5) OPENINGS BELOW TOP RAIL.

(a) Guardrails protecting the open sides of elevated platforms, walks, balconies, and mezzanines shall have intermediate rails or an ornamental pattern designed to prevent the passage of an object with a diameter larger than 6 inches, except in adult detention or correctional facilities, factory or warehouse occupancies the clear distance between intermediate rails measured at right angles to the rails may not exceed 21 inches.

(b) Guardrails in areas not subject to use by children shall be provided with an intermediate rail at mid height or equivalent.

COMM 51.164 HEADROOM.

(1) GENERAL. Except as provided in sub. (2), every means of egress shall be provided with a headroom clearance of not less than 6 feet 8 inches. In stairways, the clearance shall be 7 feet 0 inches established by measuring vertically from the edge of the tread nosing to the ceiling or soffit above the tread nosing.

Wherever one is in a building, when that individual takes the first step towards an exit, that person is in the means of egress which requires a minimum headroom clearance of not less than 6 feet 8 inches. Therefore, the minimum ceiling height in any occupied portion of a building is 6 feet 8 inches. Headroom in doorway openings may be lowered to 6 feet 4 inches.

Question: *How does the headroom requirement apply to arched doorways and other doorways without doors?*

Answer: *The 6-foot 8-inch headroom is required in all areas except doorway openings which may be reduced to 6 feet 4 inches. Openings which are 72 inches wide or less may be considered doorway openings even if doors are not installed. Arched doorways require a minimum 6 feet 4 inches headroom for the restrictive required exit, exit access, or aggregate width. Encroachments up to 4 inches on either side are allowed in passageways.*

Be aware that ch. COMM 69/ADAAG may require more vertical clearance along vehicle access routes and at parking for the disabled.

(2) EXCEPTION. The headroom clearance for public stairways in apartments and townhouses may be reduced to not less than 6 feet 8 inches.

Note: See s. COMM 57.07 (3) for requirements pertaining to stairways within individual living units.

COMM 51.165 STAIRWAY IDENTIFICATION.

All stairways serving 4 or more stories shall have each floor level or story identified on the stair side as to its name or number with a permanent sign having letters or characters at least 2 inches in height.

COMM 51.166 STAIRWAY DISCHARGE.

Where a stairway from the level below the exit discharge and a stairway from an upper floor terminate at the same exit discharge level, an approved barrier shall be provided to prevent persons from continuing down one or more full floor levels below the exit discharge level unless the exit discharge level has a vision panel to the outside or is otherwise made readily apparent.

The intent of this section is to ensure that in an emergency users of stair towers know where to leave the stair tower to the exterior. The point of discharge to the exterior must be made clear to the users by virtue of design or barrier construction.

COMM 51.167 EXITING THROUGH AREAS OF HAZARD.

(1) GENERAL. Except as provided in subs. (2) and (3), exit access shall be so arranged that it will not be necessary to travel through any area of hazard in order to reach the exit.

Note: See ss. COMM 54.14, 55.29, 56.15, 57.14, 58.24, 58.62, 59.21, 60.25, 60.37, 62.32 for additional requirements.

(2) GARAGES.

(a) Occupancies within the scope of ch. COMM 54 may exit through storage garages.

(b) Occupancies within the scope of ch. COMM 54 may not exit through repair garages.

(c) Occupancies within the scope of chs. COMM 55-62 may not exit through a storage or repair garage.

(3) KITCHENS.

(a) Exiting through a kitchen within an individual living unit is permitted.

(b) Exiting through kitchens equipped with residential-type appliances in areas such as but not limited to employe lounges, activity rooms and similar areas is permitted provided the kitchen is not used for commercial purposes.

(c) Exiting through kitchens of restaurants and similar commercial operations or kitchens equipped with commercial-type appliances is prohibited.

COMM 51.17 SMOKEPROOF STAIR TOWER.

(1) A smokeproof stair tower shall be an enclosed stairway which is entirely cut off from the building and which is reached by means of open balconies or platforms. The stairways, landings, platforms and balconies shall be of noncombustible material throughout. The enclosing walls shall be of not less than 4-hour fire-resistive construction, and the floors and ceilings of not less than 2-hour fire-resistive construction as specified in s. COMM 51.04.

If the occupancy chapter of the code requires one or more smokeproof towers, the construction of the smokeproof stair tower must meet this section. The walls enclosing the stair, including the exterior walls, must be of 4-hour construction. Access to the smokeproof stair tower must be via an open air exterior balcony.

Question: *What type of protection (rating of fire door assembly) will be required at the doorway penetration leading from the building to the balcony and from the balcony to the stairway of a smokeproof stair enclosure?*

Answer: *The doorway from the building to the balcony shall be protected by a 1 1/2-hour fire door assembly.*

The doorway from the balcony into the stairway shall be protected by a 3-hour fire door assembly.

(2) The doors leading from the buildings to the balconies and from the balconies to the stairways shall be fire-resistive doors, and all openings within 10 feet of any building shall be protected with fire-resistive windows for moderate fire exposure, or fire-resistive doors as specified in s. COMM 51.047.

(3) Each balcony shall be open on at least one side, with a railing not less than 3 feet 6 inches high on all open sides.

COMM 51.18 INTERIOR ENCLOSED STAIRWAY.

(1) GENERAL. An interior enclosed stairway shall be separated from other areas of the building by fire-resistive rated construction as specified in ss. COMM 51.04 to 51.049 with the hourly ratings as specified in Table 51.03-A.

(2) EXTENT OF ENCLOSURE.

(a) The enclosure shall include at each floor level a portion of the floor which will be at least as wide as the stairway.

An interior enclosed stairway must be enclosed with appropriately rated construction at all floor levels, including the most remote levels from the point of exit discharge, and the enclosure must extend from the stair to the outside exit.

Elevators, lifts, and other means of vertical transportation are not allowed in a stair enclosure, nor may they open directly into the enclosure.

(b) The enclosure shall provide uninterrupted passage from the uppermost floor to an outside door without leaving the enclosure.

(c) The enclosure shall also include any passageway, if provided, on the floor of exit discharge leading from the stairway to the exit discharge, so as to afford uninterrupted passage from the uppermost floor to the exit discharge, without leaving the enclosure.

(3) OPENINGS IN THE ENCLOSURE. Openings in the stairway enclosure shall be limited to exit doors serving public passageways or corridors or serving floors occupied by a single tenant.

Openings into the stair enclosure are basically limited to doors serving corridors and passageways. Individual rooms may not open directly to the enclosure. The provision allowing floors occupied by a single tenant to have doors opening directly to the enclosure is intended to apply to open plan office concepts only. Even though a floor may be occupied by a single tenant, if that floor level is

partitioned into rooms and corridors, only the corridors may open directly to the enclosure. Fixed fire rated windows as per (4)(b) may be installed in any stairway wall location.

A vestibule serving only one room or space may not have a door directly into a required exit stair enclosure. A vestibule serving two or more rooms or spaces may have a door opening directly into a required stair enclosure.

Note: See ch. Comm 18 for additional requirements pertaining to the location of elevator equipment room access doors.

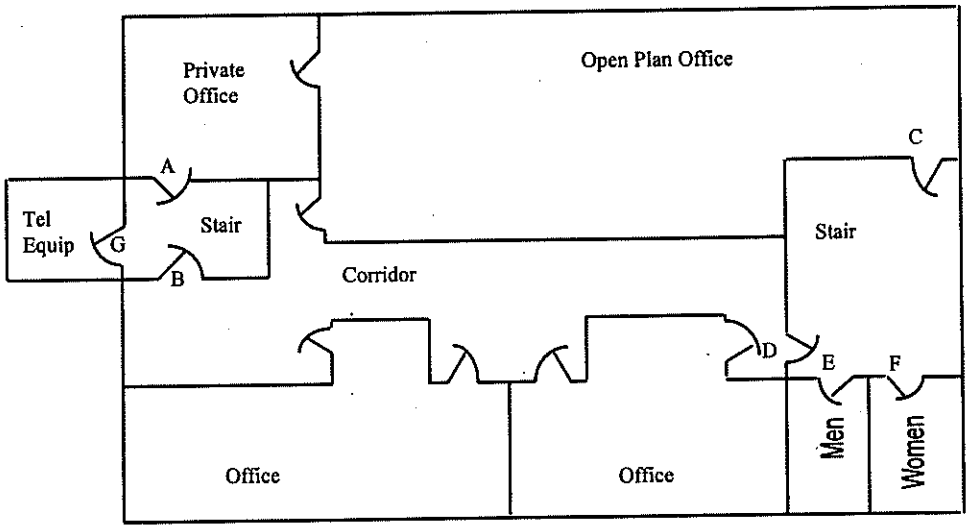
Question: *What is the requirement for window openings in the exterior walls of stair enclosures? No glazing required? Rated glazing required?*

Analysis: *The intent of this code section is to provide an exit path which is safe and protected from a fire somewhere in the building. Key words in COMM 51.18 - "interior enclosed stairway" indicate that first a fire rated separation is required between the stairway and the building. Next, the stairway must be interior which, as per definition 51.01 (139a), requires at least a roof and supporting members. Lastly, enclosed indicates walls providing weather protection are necessary.*

Answer: *The exterior perimeter of a stairway enclosed as per COMM 51.18 must provide protection from the weather. Except as required to properly separate the stairway from the building or as required by Table 51.03-A and B, this enclosure does not have to be fire rated. Openings in the exterior enclosure must be provided with glazing or other means to provide weather protection.*

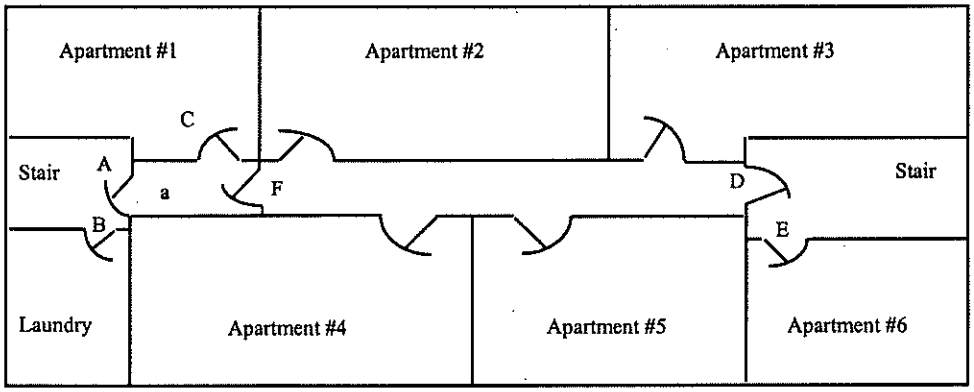
Examples of Unacceptable Design

Doors A, C, E, F, G are not permitted.



Both stairs are required to be enclosed. Doors A through G are rated fire door assemblies. Doors B and D are permitted as they serve corridors. Doors A, C, E and F ARE NOT PERMITTED. Door G must be in a public area and accessible to servicemen and is not permitted in the stair enclosure.

Doors B, C, and E are not permitted



Both stairs are required to be enclosed. Doors A, B, D and E are rated fire door assemblies. Corridor "a" is a rated corridor provided to meet exit distance. Doors A, D and F are permitted as they serve corridors. Doors B and E are not permitted. Door C is not permitted, even though Door A is provided.

(4) PROTECTION OF OPENINGS.

(a) All openings for doors shall be protected by fire-rated door assemblies as specified in s. COMM 51.047.

(b) If windows are provided in the enclosure, the window openings shall be protected by fixed fire-rated window assemblies as specified in s. COMM 51.048, except in outside walls.

COMM 51.19 HORIZONTAL EXIT.

(1) GENERAL. A horizontal exit shall consist of one or more openings through an occupancy separation; a 2-hour fire-rated separation wall extending from the basement or lowest floor to the underside of the roof deck or of one or more bridges or balconies connecting 2 buildings or parts of buildings entirely separated by occupancy separations as described in s. COMM 51.08.

A horizontal exit is an opening in a 2-hour rated wall which extends from a foundation to the under side of a roof deck and from an exterior wall to an exterior wall thereby creating two separate fire zones in the structure. Horizontal offsets, such as rated floors, are not permitted in the separation if used as a horizontal exit.

All building framing shall be discontinuous at the separating wall.

Question: ***Must*** *any door in a 2-hour or greater rated wall satisfying COMM 51.19 construction be a horizontal exit?*

Answer: *No. When an area is divided into fire zones by 2-hour or greater firewalls satisfying COMM 51.19 requirements, each zone shall be provided with at least one stairway or standard exit to grade as specified in COMM 51.15 - 51.18. Passages through openings in the firewalls may be considered as horizontal exits or exit access doors depending on the need to have a horizontal exit to satisfy exiting requirements.*

(2) PROTECTION OF OPENINGS. Openings used in connection with horizontal exits shall be protected by fire-resistive doors as specified in s. COMM 51.047.

(a) Doors serving as required exits shall be standard exit doors and shall swing in the direction of exit travel. Where a horizontal exit serves spaces on both sides of the wall, there shall be adjacent doorways equipped with doors which swing in opposite directions.

1. Exceptions.

a. The swing of the exit door may comply with the exceptions permitted in the occupancy chapters of this code.

(b) Approved illuminated exit signs shall be provided to indicate the horizontal exit.

(c) Such doors shall be kept unlocked, unobstructed, provided with a self-closing device and normally be kept closed.

1. Exception. Doors protecting openings used in connection with horizontal exits may be left opened if equipped with an automatic closing device actuated by smoke density or products of combustion other than heat.

Note: See NFPA 72 for requirements on door closer initiating devices.

(3) RAMP SLOPE. Where there is a difference of elevation between connected areas, the difference shall be overcome by a ramp with a slope of not more than one foot in 8.

(4) PROJECTION OF ADJACENT OPENINGS. All doors and windows within 10 feet of any balcony or bridge shall be fire-resistive doors or fire-resistive windows as specified in ss. COMM 51.047 and 51.048.

COMM 51.20 FIRE ESCAPES.

(1) LOCATION. Every fire escape shall be so located as to lead directly to a street, alley, or open court connected with a street.

(a) Every fire escape shall be placed against a blank wall if possible. If such a location is not possible then every wall opening which is less than 6 feet distant horizontally from any tread or platform of the fire escape shall be protected by a fire-resistive window for moderate fire exposure or by a fire-resistive door as specified in ss. COMM 51.047 and 51.048.

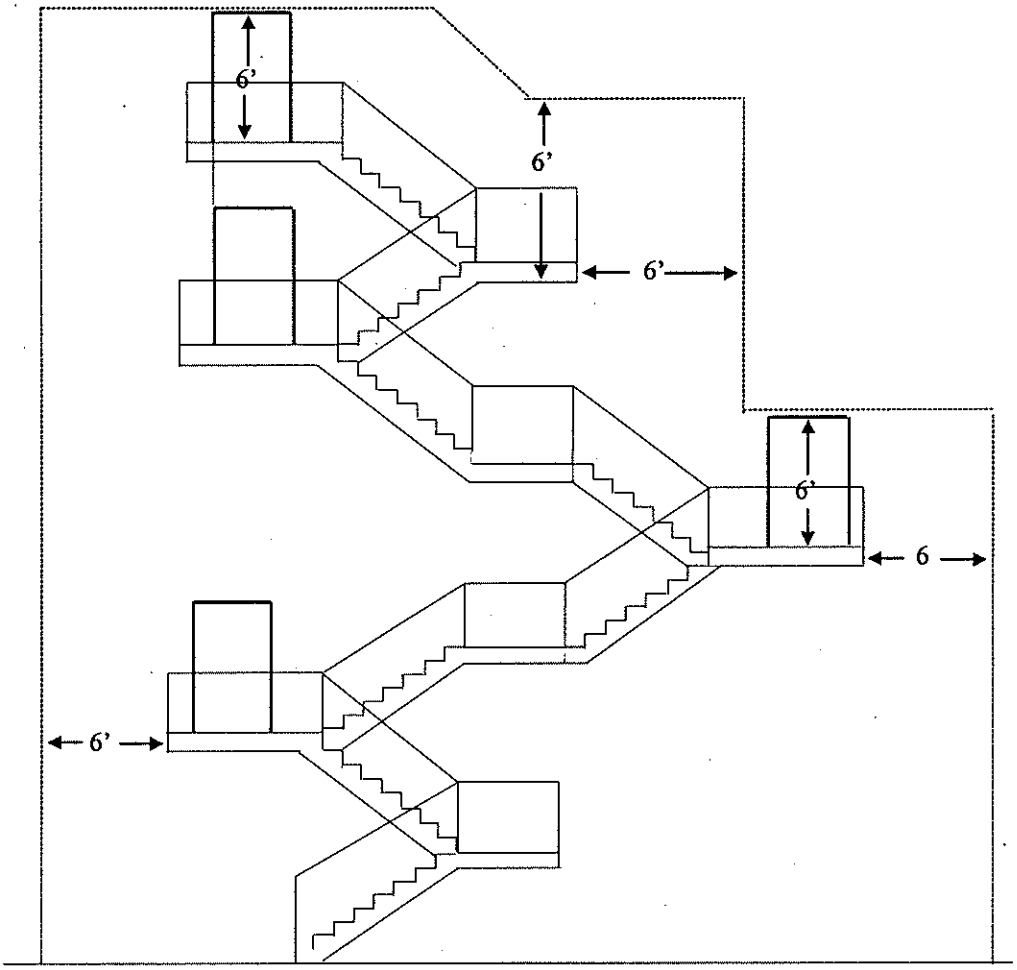
All wall openings within 6 feet of a fire escape must be protected by fire door or fire windows assemblies. This will include the exit or exit access doors leading from the building to the escape.

Question: *COMM 51.20 (1)(a) What area does the 6-foot horizontal dimension actually encompass for fire escape protection?*

Answer: *The intent of the code is to protect the occupants utilizing a fire escape from the products of combustion.*

Since the products of combustion (smoke, heat, fire) rise, the entire area below a fire escape should be protected. Likewise, a fire 6 feet above the fire escape will not impede exiting.

The area of required protection for fire escapes is all areas from the ground to 6 feet above any tread or platform which are within 6 feet horizontally from any tread or platform of the fire escape. See illustration.



(2) EXITS TO FIRE ESCAPES. Every fire escape shall be accessible from a public passageway or shall be directly accessible from each occupied room. Exits to fire escapes shall be standard exit doors as specified in s. COMM 51.15, except that doors to "A" fire escapes may be not less than 2 feet 6 inches wide.

The code does not recognize windows as acceptable means of accessing fire escapes.

Question: *Are doors leading to fire escapes required to be fire door assemblies?*

Analysis: COMM 51.20 (1)(a) requires that all wall openings which are within six feet horizontally of a fire escape must be protected by fire door or window assemblies. COMM 51.20(2) requires that exits to fire escapes must meet COMM 51.15, however, there is no cross reference to COMM 51.047 for the exit door to the escape. These sections of the code are not to be considered in conflict. COMM 51.15 sets forth standards related to door size, swing, hardware and identification, only. COMM 51.047 sets standards for fire door assemblies, only. The reference to 51.047 made by 51.20(1)(a) is intended to require a separation between the building and the escape, while the reference to 51.15 made by 51.20(2) is to insure that the door will function as an exit.

Answer: *All exit doors leading to fire escapes must meet the swing, size, hardware and identification requirements of COMM 51.15, and, all doors, including the one at the top of the escape, must also be labeled fire door assemblies in accordance with COMM 51.047, unless specific exceptions in the occupancy chapters permit deviation.*

Note: *The code specifications for fire doors have changed over the years. Fire doors which met the code at the time of their installation thus may remain.*

(3) DESIGN AND FABRICATION. Each part of every fire escape (except counterweights for balanced stairways) shall be designed and constructed to carry a live load of 100 pounds per square foot of horizontal area over the entire fire escape. Each part of every fire escape shall be designed and constructed in accordance with the requirements of s. COMM 53.50, except that the unit stresses therein specified shall be reduced by one-fourth. The minimum sections and sizes specified below shall be increased whenever necessary so that under full load the allowable unit stresses will not be exceeded.

(a) No other material than wrought iron, soft steel or medium steel shall be used for any part of a fire escape, except for weights, separators and ornaments. No bar material less than 1/4 inch thick shall be used in the construction of any fire escape, except for separators, ornaments, structural shapes over 3 inches and rigidly built up treads and platforms of approved design. In the fabrication of a fire escape, all connections or joints shall be made by riveting, bolting or welding in an approved manner. All bolts or rivets, except for ornamental work, shall be not less than 3/8 inch in diameter.

(4) PLATFORMS. Each platform on an "A" fire escape shall be at least 28 inches wide; each platform on a "B" fire escape shall be at least 3 feet 4 inches wide. Such widths shall be the clear distance between stringers, measuring at the narrowest point. Each platform shall extend at least 4 inches beyond the jambs of exit opening. The above minimum widths and lengths shall be increased, wherever necessary, so that no exit door or window will, when open, block any part of the required width of the fire escape. Every platform shall consist of either:

(a) Flat bars on edge, not less than 1 x 1/4 inch, but not less than 1 1/4 x 1/4 inch where bolts and separators are used except that platforms and treads constructed of flat bars on edge may be made of material 3/16 inch in thickness provided the material is galvanized after fabrication. Bars shall not be spaced more than 1 1/4 inches, center to center.

(b) 1/2 inch or 5/8 inch square bars with sharp edge up, not more than 1 1/2 inches, center to center.

(c) 5/8 inch round bars, not more than 1 1/2 inches, center to center.

(d) Platform and treads may be solid if covered by a roof.

(e) The platform frame shall consist of not less than 2 x 3/8 inch flat bars on edge or equivalent, provided the brackets are not more than 4 feet apart. If brackets are more than 4 feet apart, the frame shall be correspondingly stronger and stiffer. Every platform wider than 30 inches, if made of square or round bars, shall have a third frame bar through the center; if made of flat bars, the platform shall have separators and bolts through the center. Frame bars shall not project more than 1/4 inch above platform bars, except around the outside of platform.

(f) There shall be a platform at each story above the first, and intermediate platforms if floors are more than 18 feet apart vertically.

(g) Platforms shall not be more than 8 inches below the door sill.

(5) BRACKETS. Brackets for a 28-inch or 30-inch platform, when spaced not more than 4 feet apart, shall be made of not less than 7/8 inch square bars or 1 1/2 x 1 1/2 x 1/4 inch angles; such bars or angles shall be larger if the platform is wider or if the brackets are farther apart. Each bracket shall be fastened at the top to the wall by a through bolt (at least 7/8 inch diameter), nut, and washer (at least 4-inch diameter). The slope of the lower bracket bar shall be not less than 30° with the horizontal. The lower bar shall have a washer or shoulder to give sufficient bearing against the wall.

(a) The strength of the wall to which brackets are to be attached shall be carefully considered in determining the spacing, shape and inside connection of brackets, so that under full load the wall will not be unduly strained. Where it is necessary to install brackets adjacent to wall openings they shall be located at a suitable distance therefrom, or the wall shall be properly reinforced.

(6) STAIRWAYS.

(a) Each stairway of an "A" fire escape shall be at least 24 inches wide between stringers; such stairway shall have a uniform rise of not more than 8 inches and a uniform run of not less than 8 inches.

(b) Each stairway of a "B" fire escape shall be at least 3 feet 4 inches wide between stringers; such stairway shall have a uniform rise of not more than 8 inches, and a uniform run of not less than 9 inches.

1. The rise is the vertical distance from the extreme edge of any step to the corresponding extreme edge of the next step. The run is the horizontal distance between the same points.

(c) Stairway stringers shall consist of either:

1. A 5-inch channel or larger.
2. Two angles 2 x 2 x 1/4 inch or larger.
3. Two flat bars 2 x 3/8 inch or larger.
4. One flat bar 6 x 1/4 inch or larger.
5. If 2 angles or 2 flat bars are used, they shall be properly tied together by lattice bars, vertical as well as horizontal. If flat bars are used, every stairway of more than 10 risers shall have lateral bracing. The connection of stringers to platform, at top and bottom, shall be at least equal in strength to the stringers and shall safely carry the full live and dead loads. If stringers are carried by intermediate brackets, the stringers shall have a horizontal bearing on the brackets and shall be properly and securely connected thereto.
6. Treads shall consist of either flat or square bars, (not round), of the size and spacing specified for platforms. An "A" tread shall consist of at least 6 square bars, or 7 flat bars. A "B" tread shall consist of at least 7 square bars, or 8 flat bars. A "B" tread made of flat bars shall have separators and bolt through the center. A "B" tread made of square bars shall be trussed.
7. Treads and platforms may be solid if covered by a roof.

(7) BALANCED STAIRWAY. All "B" fire escapes, and all fire escapes on schools, theaters, assembly halls, hospitals, nursing homes, residential care institutions, group foster homes, and homes for the elderly either shall reach to the ground or shall have a balanced stairway reaching to the ground. "A" fire escapes which are not on schools, theaters, assembly halls, hospitals,

nursing homes, residential care institutions, group foster homes and homes for the elderly may terminate in a platform at least 3 feet long, located not more than 10 feet above the ground and does not serve more than 8 persons.

This code section permits a fire escape to terminate at a platform not more than 10 feet above the ground. This is commonly referred to as a rescue platform. Please note that if the fire escape serves an occupancy with a capacity in excess of eight persons, the fire escape must lead, via a stair or balanced stairway, to the ground. Sections COMM 54.03 and COMM 57.05 contain provisions permitting combustible rescue platforms under certain circumstances. If the limitations found in Chapters 54 and 57 cannot be met and if a platform is desired, the platform must be constructed as a fire escape complying with all elements of COMM 51.20.

(8) RAILINGS. A railing at least 42 inches in height, measuring vertically from the floor of the platform, shall be provided on all open sides of platforms. Railings at least 36 inches in height, measuring vertically from the nose of the treads, shall be provided on the open sides of all stairways and on both sides of balanced stairways. Either a railing or a handrail fastened to the wall shall be provided on each side of all "B" fire escape stairways. Railings on fire escapes subject to use by children shall have intermediate rails or an ornamental pattern designed to prevent the passage of an object with a diameter larger than 6 inches. Railings on fire escapes not subject to use by children shall be provided with 2 uniformly spaced intermediate rails.

(a) Every railing shall have posts, not more than 5 feet apart made of not less than 1 1/2 x 1 1/2 x 1/4 inch angles or tees, or 1 1/4-inch pipe; top rail not less than 1 1/4 x 1 1/4 x 1/4 inch angle or equivalent; center rail not less than 1 1/4 x 5/16 flat bar or equivalent. All connections shall be such as to make the railing stiff; 2 bolts (3/8 inch or larger) shall be used at the foot of each post wherever possible, or at least one 1/2 inch bolt shall be used. Railing shall be continuous. No projections on the inside of the railing shall be permitted. Where a railing returns to the wall, it shall be fastened thereto with a through bolt (at least 5/8 inch diameter), nut, and washer; or (in reinforced concrete) with an approved insert; or the railing shall be made equally secure with a diagonal brace extending at least 3 feet horizontally and 3 feet vertically.

(b) All outside railings which are more than 60 feet above grade shall be at least 6 feet high, measuring vertically from floor of platform or from nose of step. Such railings shall be of special design approved by the department, having not less than 4 longitudinal rails, and vertical lattice bars not more than 8 inches apart, and proper stiffening braces or brackets.

(9) LADDER TO ROOF. Every fire escape which extends higher than the second floor shall be provided with a ladder leading from the upper platform to the roof, unless the fire escape stairway leads to the roof. The ladder shall have stringers not less than 1 1/4 inch pipe, or not less than 2 x 3/8 inch flat bars, at least 16 inches apart in the clear. The rungs shall be not less than 1/2 inch square or 3/4 inch round bars, 12 inches center to center. The stringers shall be securely tied together at intervals no greater than every fifth rung. The stringers of each ladder shall extend not less than 3 1/2 feet above the roof coping and return to within 2 feet of the roof, with the top rung of the ladder level with the coping.

(10) OTHER TYPES OF FIRE ESCAPES. Sliding or chute fire escapes may be used, upon the approval of the department of industry, labor and human relations, in place of "A" or "B" fire escapes. Every sliding fire escape shall be provided with a ladder constructed as in sub. (9), extending from 5 feet above grade, to 4 feet above the roof coping.

COMM 51.21 STANDPIPE AND HOSE SYSTEMS.

(1) GENERAL REQUIREMENTS. All required standpipe and hose systems shall meet the requirements of this section.

Note: The department will accept installations conforming to the latest edition of NFPA No. 14—Standard for Installation of Standpipe and Hose Systems.

COMM 51.21 (3), (4) and (6)
STANDPIPE REQUIREMENTS
BY OCCUPANCY CHAPTER
Commentary

	COMM 54.15	*COMM 55.33*	*COMM 56.20*	*COMM 57.15*	*COMM 58.28 & 58.63*	*COMM 59.23*	*COMM 62.30*
CLASS I Standpipe System Required	*ALL BUILDINGS EXCEEDING 60 FEET IN HEIGHT*						*More than two levels (Dry Standpipe)*
CLASS II Standpipe System Required	*3 Stories Factory (Opt.*)*	*Theater Stage*	*Not Required*	*Not Required*	*ALL**	*Not Required*	*Not Required*
Dry Standpipe*	*3 Stories*	*750 Occ.*	*3 Stories*	*3 Stories*	*Not Required*	*3 Stories & Below Grade*	*See Class I*

* Not required if complete sprinkler protection is provided. See occupancy chapter for other exceptions.

(2) CLASSES OF SERVICE.

(a) *Class I* - Fire department standpipes. For use by fire departments and those trained in handling heavy fire streams from a 2 1/2-inch hose.

(b) *Class II* - First-aid standpipes. For use primarily by occupants of a building until the arrival of the fire department (1 1/2-inch hose).

(c) *Class III* - Combination fire department and first-aid standpipes. For use by either fire departments and those trained in handling heavy hose streams or by the building occupants.

(d) *Dry standpipes*. For use by fire departments.

(3) CLASS I - FIRE DEPARTMENT STANDPIPES.

(a) *Where required.* Fire department standpipes shall be provided for all buildings exceeding 60 feet in height.

1. Required standpipes shall be installed as construction progresses, to make them available for fire department use in the topmost floor constructed. Temporary standpipes

may be provided in place of permanent standpipes during the period of construction when approved by the local fire department.

(b) *Number of standpipes.* Standpipes shall be sufficient in number so that any part of every floor area can be reached within 30 feet by a nozzle attached to 100 feet of hose connected to the standpipe in an unsprinklered building and 150 feet of hose in a sprinklered building.

(c) *Cross connections.* When 2 or more standpipes are required, they shall be cross connected and equipped with individual control valves. All control valves shall be of an approved indicating type valve. The valves shall be located so that the water supply to any standpipe riser can be shut off without interrupting the water supply to the remaining standpipes and be readily accessible to the fire department.

(d) *Location of outlets.* Hose outlets shall be located in stairway enclosures. Where stairways are not enclosed, outlets shall be at the inside of outside walls, within one foot of a smokeproof tower, interior stairway or fire escape. In buildings containing large interior areas, standpipes may be located at accessible interior locations.

(e) *Protection of standpipes.* Standpipes shall be protected against mechanical and fire damage. Dry standpipes shall be visible for inspection and not concealed.

Note: It is not the intent of this section to require standpipes to be protected with an hourly rated fire protection.

(f) *Size.* No required standpipe shall be less than 4 inches in diameter, and not less than 6 inches in diameter for standpipes in excess of 100 feet in height unless the building is completely sprinklered and the standpipe system is hydraulically designed in accordance with the requirements of sub. (6).

(g) *Hose valves and connections.* An approved 2 1/2-inch hose-connection valve shall be located at each story, not less than 3 feet nor more than 6 feet above the floor level. Hose-connection valves shall be equipped with a tight-fitting cap on a chain and having lugs for a spanner wrench. When the building is completely sprinklered, and Class II service is omitted, each standpipe outlet location shall be equipped with a 2 1/2-inch hose valve, a 2 1/2-inch by 1 1/2-inch reducer, and a cap with an attached chain.

(h) *Hose threads.* All threads on hose connections shall be of national standard dimensions.

Note: Section 213.15, Stats., requires that all hose connections be fitted with the national standard hose threads adopted by the national fire protection association.

(i) *Fire department connection.* An approved fire department connection shall be installed on a 4-inch or larger pipe connection with each standpipe system. The connection shall be marked "Standpipe." If automatic fire sprinklers are also supplied by the hose connection, the sign shall read "Standpipe and Automatic Sprinkler." The elevation of the connection may be not less than 18 inches nor more than 42 inches above the sidewalk or ground. If municipal water is available at the building site, the fire department connection shall be located as close as possible to and within 150 feet of any fire hydrant.

The department will accept letters from the local fire department allowing a greater distance. (See 51.23 (4).)

(j) *Automatic water supply.* An automatic water supply for a wet standpipe system shall be designed to provide not less than the following capacity from top outlets at not less than 65 psi flowing pressure for a period of 30 minutes; 500 gpm for a single standpipe; 750 gpm

for 2 interconnected standpipes; 1,000 gpm for larger systems. Any of the following supplies will be acceptable:

1. Public waterworks system where pressure and discharge capacity are adequate;
2. Approved automatic fire pump (or pumps);
3. Pressure tank;
4. Gravity tank;
5. Approved manually controlled fire pump operated by remote control devices at each hose outlet; or
6. Reservoirs.

(k) *Dry standpipes.* If only one standpipe is required, a dry standpipe may be used. A dry standpipe shall be limited to a single riser and shall not exceed 150 feet in height.

(4) CLASS II - FIRST-AID STANDPIPES.

(a) *Where required.* First-aid standpipes shall be provided as required by the occupancy chapters of this code.

(b) *Number and location.* Standpipes shall be sufficient in number so that any part of every floor area, including basements, can be reached within 30 feet by a nozzle attached to not more than 100 feet of hose connected to a standpipe.

1. Hose outlets shall be located in occupied areas and preferably in corridors or at interior columns.

(c) *Size.* No required standpipe shall be less than 2 inches in diameter for buildings 4 or less stories or 50 feet in height, and not less than 2 1/2 inches in diameter for buildings exceeding 4 stories or 50 feet in height.

(d) *Hose valves and connections.* An approved 1 1/2-inch hose valve shall be located not more than 5 feet above the floor level. Where the static pressure at any standpipe hose outlet exceeds 100 psi, an approved device shall be installed at the outlet to reduce the pressure with the required flow at the outlet to not more than 100 psi.

(e) *Hoses.* Not more than 100 feet of hose shall be attached to each outlet. Hoses shall be of an approved type, 1 1/2-inches in diameter, with 1/2-inch solid stream or combination nozzle attached, and shall be located in approved cabinets, racks or reels. In locations where the use of a solid stream may contribute to the spread of fire by scattering the burning material or where the existence of flammable liquids make the use of spray stream desirable, combination nozzles which give a spray or a solid stream shall be provided instead of 1/2-inch nozzles.

Question: *Under what circumstances may standpipe hoses be removed?*

Answer: *The requirement for standpipe hoses was dropped in favor of requiring stair enclosures, interior finish restrictions, more restrictive exiting requirements, fire extinguishers, etc. To determine if a standpipe could possibly be removed, the designers should work with the local fire departments to evaluate the conditions as follows:*

1. Check the codes in effect at the time the building and any additions or alterations were constructed.

a. If the code did not require standpipes, they may be removed.

b. If older codes required standpipes, the choices are to:

1) Maintain.

2) Bring the building into compliance with the current code (i.e., standpipe hoses were dropped in favor of stair enclosures, interior finish, more restrictive exit requirements, fire extinguishers, etc.).

3) Get a variance to allow hose removal.

2. If the hoses may be removed and the local fire department authorizes the removal, the entire system must be removed or the appearance of the standpipe must be removed to avoid false sense of fire protection.

(f) *Water supply.* An automatic water supply shall be provided. The water supply shall be designed for 100 gpm for 30 minutes with 65 psi flowing pressure at the top outlet. The water supply may be from a city connection, gravity tank, pressure tank or pump.

Note 1: The department will permit the domestic water supply system to service Class II standpipes.

Note 2: The department will permit pumps, other than fire pumps, provided the water supply meets the requirements of sub. (4) (f).

(5) CLASS III - COMBINED FIRE DEPARTMENT AND FIRST-AID STANDPIPES.

(a) *Where permitted.* The features of Class I and II service may be combined in a single system if served by an acceptable automatic water supply conforming to the requirements of sub. (3) (j).

(b) *Requirements.* Class III standpipes shall conform to the requirements of Class I service except that 1 1/2-inch outlets with a hose and 2 1/2-inch outlets shall be provided on each floor and shall be installed to the requirements of the respective classes of service.

(6) DRY STANDPIPES.

(a) *Where required.* Dry standpipes shall be provided as required by chs. COMM 54 to 62.

Note: See ss. COMM 54.15, 55.33, 56.20, 57.15 and 62.30.

(b) *Number and location.* Required dry standpipes shall be provided in each stair enclosure.

In instances such as townhouses where there are no enclosed stairways, dry standpipes are not required.

(c) *Hose valves and connections.*

1. Required dry standpipes shall be provided with approved 2 1/2-inch valve hose connections at each floor level with one connection in the stair tower and one immediately outside.

2. Required dry standpipes with a fire department Siamese connection greater than 50 feet to a street shall be interconnected to a standpipe system with the connection 50 feet or less to a street.

(d) *Miscellaneous requirements.* Dry standpipes shall conform to the requirements specified in sub. (3) (e) to (i).

(7) COMBINED AUTOMATIC SPRINKLER AND STANDPIPE SYSTEM.

(a) *Definition.* A combined system is a system where the vertical water piping serves both the automatic sprinkler system and the 2 1/2-inch hose outlets of the standpipes used by the fire department. The combined system shall comply with the automatic sprinkler requirements of s. COMM 51.23 and the standpipe and hose requirements of s. COMM 51.21.

(b) *Water supply and riser size.* The minimum water supply and riser size for a combined system shall comply with the requirements of sub. (3) (f) and (j), except the minimum water supply for a combined system for a completely sprinklered, light hazard occupancy building shall be 500 gallons per minute. When the building is completely sprinklered, the risers may be sized by hydraulic calculations.

Note: NFPA 13 defines light hazard occupancies as occupancies where the quantity and/or combustibility of contents is low and fires with relatively low rates of heat release are expected, such as: churches; clubs; educational; hospitals; institutional; libraries, except large stack rooms; museums; nursing or convalescent homes; offices, including data processing; residential; restaurant seating areas; theaters and auditoriums, excluding stages and prosceniums; and unused attics.

(c) *Connections.* Each connection from a vertical riser of a combined system shall be provided with an individual control valve of the same size as the outlet.

(8) MAINTENANCE. Standpipe systems and equipment, whether required by this code or not, shall be maintained in an operable condition.

(9) CROSS CONNECTION CONTROL. A standpipe system connecting to a domestic water supply system or to a municipal water main shall be protected against backflow conditions in accordance with s. COMM 82.41. If a reduced pressure principle backflow preventer or a reduced pressure detector backflow preventer is used as the type of cross connection control, plans for the device shall be submitted for review in accordance with s. COMM 82.20 (1).

COMM 51.22 FIRE EXTINGUISHERS.

(1) GENERAL. All required fire extinguishers shall comply with the provisions of NFPA No. 10.

(2) INSTALLATION. Fire extinguishers as specified in chs. COMM 54-62 shall be installed as specified in NFPA No. 10.

(3) MAINTENANCE. All portable fire extinguishers, whether required by chs. COMM 54-62 or not, shall be maintained in operable condition as specified in NFPA No. 10.

TABLE 3-2.1

	Light (Low) Hazard Occupancy	*Ordinary (Moderate) Hazard Occupancy*	*Extra (High) Hazard Occupancy*
Minimum rated single extinguisher	*2-A*	*2-A*	*4-A**
Maximum floor area per unit of A	*3,000 sq. ft*	*1,500 sq. ft.*	*1,000 sq. ft.*
Maximum floor area for extinguisher	*11,250 sq. ft.*	*11,250 sq. ft.*	*11,250 sq. ft.*
Maximum travel distance to extinguisher	*75 ft.*	*75 ft.*	*75 ft.*

** Two 2 1/2 gallon water type extinguishers can be used to fulfill the requirements of one 4-A rated extinguisher.*

A-51.22 FIRE EXTINGUISHERS. The following information is taken from the National Fire Protection Association Standard #10-1988 - Portable Fire Extinguishers. The information is provided to assist building designers in determining the number, type and location of fire extinguishers needed to comply with the provisions of the standard.

1-4 Classification and Ratings of Fire Extinguishers.

1-4.1 Portable fire extinguishers are classified for use on certain classes of fires and rated for relative extinguishing effectiveness at a temperature of plus 70°F by testing laboratories. This is based upon the preceding classification of fires and the fire-extinguishment potentials as determined by fire tests.

1-4.2 The classification and rating system described in this standard is that used by Underwriters Laboratories, Inc., and Underwriters Laboratories of Canada and is based on extinguishing preplanned fires of determined sizes and description as follows:

Class A Rating—Wood and excelsior.

Class B Rating—Two-inch depth n-heptane fires in square pans.

Class C Rating—No fire test. Agent must be a nonconductor of electricity.

Class D Rating—Special tests on specific combustible metal fires.

1-5 Classification of Hazards.

1-5.1 Light (low) hazard. Light hazard occupancies are locations where the total amount of Class A combustible materials, including furnishings, decorations and contents, is of minor quantity. This may include some buildings or rooms occupied as offices, classrooms, churches, assembly halls, etc. This classification anticipates that the majority of contents items are either noncombustible or so arranged that a fire is not likely to spread rapidly. Small amounts of Class B flammables used for duplicating machines, art departments, etc., are included provided that they are kept in closed containers and safely stored.

1-5.2 Ordinary (moderate) hazard. Ordinary hazard occupancies are locations where the total amount of Class A combustibles and Class B flammables are present in greater amounts than expected under light (low) hazard occupancies. These occupancies could consist of offices, classrooms, mercantile shops and allied storage, light manufacturing, research operations, auto showrooms, parking garages, workshop or support service areas of light (low) hazard occupancies and warehouses containing Class I or Class II commodities as defined by NFPA 231, Standard for General Storage.

1-5.3 Extra (high) hazard. Extra hazard occupancies are locations where the total amount of Class A combustibles and Class B flammables present, in storage, production use, and/or finished product is over and above those expected and classed as ordinary (moderate) hazards. These occupancies could consist of woodwork, vehicle repair, aircraft and boat servicing, individual product display showrooms, product convention center displays, storage and manufacturing processes such as painting, dipping, coating, including flammable liquid handling. Also include warehousing of, or in-process storage of other than Class I and Class II commodities.

3-2 Fire Extinguisher Size and Placement for Class A Hazards.

3-2.1 Minimal sizes of fire extinguishers for the listed grades of hazards shall be provided on the basis of Table 3-2.1 except as modified by 3-2.3. Extinguishers shall be located so that the maximum travel distances shall not exceed those specified in Table 3-2.1, except as modified by 3-2.3.

3-2.1.1 Certain smaller extinguishers which are charged with multipurpose dry chemical or Halon 1211 are rated on Class B and Class C fires, but have insufficient effectiveness to earn the minimum 1-A rating even though they have value in extinguishing small Class A fires. They shall not be used to meet the requirements of 3-2.1.

3-2.2 Up to one-half of the complement of extinguishers as specified in Table 3-2.1 may be replaced by uniformly spaced 1 1/2-inch hose stations for use by the occupants of the building. When hose stations are so provided, they shall conform to NFPA 14, Installation of Standpipe and Hose Systems. The location of hose stations and the placement of fire extinguishers shall be in such a manner that the hose stations do not replace more than every other extinguisher.]

3-2.3 Where the floor area of a building is less than that specified in Table 3-2.1, at least one extinguisher of the minimum size recommended shall be provided.

3-2.4 The protection requirements may be fulfilled with extinguishers of higher rating provided the travel distance to such larger extinguishers shall not exceed 75 feet.

COMM 51.23 AUTOMATIC SPRINKLERS.

(1) GENERAL REQUIREMENTS.

(a) All automatic fire sprinkler systems shall be designed and installed in accordance with NFPA No. 13 except as permitted in chs. COMM 54 to 62.

***Question**: NFPA 13, Section 4-5.5.1 Exception allow the omission of sprinklers at the bottom of an enclosed non-combustible elevator shaft if it does not contain combustible hydraulic fluids. Is there a hydraulic fluid that is classified as non-combustible?*

***Answer:** In accordance with NFPA 30, Flamable and Combustible Liquids Code, any liquid having a flash point , when tested in accordance with the appropriate ASTM standard such as D56, D3278, D3828, is considered to be combustible. At this time, there are no hydraulic fluids that meet the noncombustibility criteria of the ASTM standards.*

(b) 1. A sprinkler system shall be so designed, installed and maintained as to provide complete coverage for all portions of the building, except:

2. Sprinkler heads may be omitted within a room dedicated exclusively to electrical equipment provided:

The intent of this rule is to prevent electrical shock due to high voltage equipment. It is not the intent of this rule to omit sprinkler protection from rooms containing low voltage, communication or computer equipment.

a. The room is separated from other portions of the building by at least one-hour fire-resistive construction;

b. The room is equipped with a smoke detector the activation of which is either audible throughout all the occupied areas of the building or interconnected to a manual fire alarm system; and

c. The storage of combustible materials within the room is prohibited.

Note: See ch. COMM 18 for requirements pertaining to automatic fire sprinkler system protection for elevators.

(c) Reinstallation of used sprinkler heads shall be prohibited.

(d) Approved secondhand devices other than sprinkler heads may be installed by special permission of the department.

Question: *When can sprinkler protection (i.e., sprinkler heads) be omitted from concealed combustible truss spaces?*

Analysis: *This requirement for sprinkler installation within concealed combustible spaces are identified within NFPA 13, the standard recognized by this department and referenced under s. COMM 51.23. It should be noted that the standard includes the requirement for the protection of all concealed combustible spaces, not just those involving wood trusses. It must also be noted that the answers/exceptions noted below are being provided in response to those spaces incorporating the use of open web wood trusses/joists only.*

Answer: *NFPA 13-1987 sect. 4-4.4.1 indicates "All concealed spaces enclosed wholly or partly by exposed combustible construction shall be protected by sprinklers.*

The exceptions to the requirement which are applicable to wood trusses/joists (having openings in the web area) being part of the concealed spaces are as follows:

1. The ceiling is attached directly to the underside of the truss/joist and the space is fire-stopped into volumes not exceeding 160 cubic feet each.

2. The ceiling is suspended below the bottom of the truss/joist, noncombustible insulation is used to fill the space from the suspended ceiling to the bottom of the joist/truss, and the space above the bottom of the joist if fire-stopped into volumes not exceeding 160 cubic feet each.

3. The space is entirely filled with noncombustible insulation.

4. Small spaces over rooms not exceeding 50 square feet in area provided the space is effectively fire-stopped at the perimeter of the room (otherwise 160 cubic foot rule would prevail).

5. If the combustible construction (wood deck, stud walls, trusses, or joists) is fire retardant treated [see 51.01 (52)].

Note: The department will accept equipment, materials and devices listed or labeled by Underwriters' Laboratories or approved by Factory Mutual. Other testing laboratories or inspection agencies will be recognized as an approved agency if accepted in writing by the department.

(2) WATER SUPPLY.

(a) Approved automatic water supplies for the sprinkler system recognized by the department are listed below:

1. City water main;
2. Gravity or pressure tank;
3. Ground storage reservoir; or
4. Natural bodies of water approved by the department (lakes, rivers, streams, etc.).

(b) If the water supply has inadequate pressure, an approved fire pump or tank shall be provided. The design and installation of water supply facilities for gravity tanks, fire pumps, reservoirs or pressure tanks, and underground piping shall conform to NFPA No. 22, NFPA No. 20, and NFPA No. 24.

(c) The connection of an automatic fire sprinkler system to a municipal water main shall be protected against backflow conditions in accordance with s. COMM 82.41.

1. If a reduced pressure principle backflow preventer or a reduced pressure detector assembly backflow preventer is used as the type of cross connection control, plans for the device shall be submitted for review in accordance with s. COMM 82.20 (1).

2. Cross connection control devices shall be tested in accordance with s. COMM 82.21 (3).

(3) BASEMENT SPRINKLERS. In buildings where sprinklers are installed in the basement only, sprinklers shall also be provided in all of the following:

(a) All shafts leading to the story above.

(b) All elevator hoistways as required by NFPA 13.

(4) FIRE DEPARTMENT CONNECTION. Except as provided in s. COMM 57.016 (1)(a), every automatic fire sprinkler system installed in accordance with NFPA 13 shall have an approved fire department connection as specified in NFPA 13. The connection shall be marked "Sprinkler." If standpipes are also supplied by the hose connection, the sign shall read "Standpipe and Automatic Sprinkler." The elevation of the connection shall be not less than 18 inches nor more than 42 inches above the sidewalk or ground. If municipal water is available at the building site, the fire department connection shall be located within 150 feet of a municipal fire hydrant, unless the fire department provides a written statement accepting a specified greater distance.

(5) SPRINKLER ALARMS. Every sprinkler system shall be provided with a suitable audible alarm. In all buildings over 60 feet in height, each sprinkler system on each floor shall be equipped with a separate water flow device connected to an alarm system.

(6) MAINTENANCE.

(a) All installed automatic sprinkler systems, whether required by this code or not, shall be properly maintained for efficient service pursuant to NFPA 25. Owners or operators shall be responsible for the condition of their sprinkler system and shall use due diligence in keeping the system in good operating condition. Records of inspections, test, and maintenance as specified in NFPA 25 shall be kept and shall be made available, upon request, to the department or its authorized deputies. The local fire department shall be notified whenever the automatic fire sprinkler system is shut down or impaired and when it is placed back in service. The owner shall arrange for immediate and continual servicing or repair of the automatic fire sprinkler system until it is placed back in operation.

All sprinkler systems whether required by code or not must be maintained in a operable condition. In lieu of maintaining a sprinkler system which is not required by the code, the sprinkler system may be removed. Local fire officials should be contacted prior to removal of a nonrequired sprinkler system and their permission obtained.

(b) The requirements of par. (a) shall apply to all buildings in existence on the effective date of this section and to those buildings constructed thereafter.

(c) The activities relating to the inspection and testing of all existing automatic fire sprinkler systems as required by NFPA 25, including waterflow and alarm tests, shall be conducted at least once a year by a person who holds a credential issued by the department as a licensed

automatic fire sprinkler contractor, licensed journeyman automatic fire sprinkler fitter, registered automatic fire sprinkler system apprentice, registered automatic fire sprinkler contractor-maintenance, registered fire sprinkler maintenance fitter or registered automatic fire sprinkler system tester.

Note 1: Section 51.23 (6)(c) does not limit or preclude other individuals from conducting the daily, weekly, monthly, quarterly or semi-annual activities relating to inspection and testing of automatic fire sprinkler systems required under NFPA 25 and NFPA 72.

Note 2: See ss. 145.12 (1), 145.15 (4), 145.165 and 145.175, Stats., and ss. Comm 5.50 to 5.55 concerning who may install, modify or maintain automatic fire systems.

(7) PARTIAL AUTOMATIC FIRE SPRINKLER SYSTEMS. Partial automatic fire sprinkler systems may be connected without a fire department connection to the domestic water supply system or a first-aid standpipe or a fire department standpipe provided all of the following conditions are satisfied:

(a) The number of sprinkler heads per building does not exceed 20;

(b) The connection is equipped with an approved indicating valve with a monitor or an approved locking device and a check valve;

(c) The water pressure and volume is adequate to supply the required flow of the largest number of sprinkler heads in any one of the enclosed areas;

(d) An audible alarm is provided to sound when the system is in operation; and

Note: See ch. COMM 82 for requirements pertaining to cross connections.

(e) A pressure gauge and test valve are provided to facilitate the testing and maintenance of the system in accordance with sub. (6).

(8) SUBSTITUTE AUTOMATIC FIRE SUPPRESSION SYSTEMS. When approved by the department, substitute automatic fire suppression systems may be used in lieu of an automatic fire sprinkler system in areas where the use of water could cause unusual damage to equipment, or where water may have a limited effect or may be hazardous to use because of the nature of processes involved.

(9) SYSTEM SUPERVISION AND MONITORING. The height limitations and fire resistive ratings in s. COMM 51.02 (21) and (22) and the unlimited area buildings specified in chs. COMM 54 to 62 shall be permitted only where the automatic fire sprinkler system is equipped with supervised sprinkler system valves or other approved component indicators, such as but not limited to fire pump power indicator or low water level indicator. The supervision function of the automatic fire sprinkler system shall be monitored by a central station, remote, auxiliary or proprietary fire alarm system company.

(10) CROSS CONNECTION CONTROL. The connection of an automatic fire sprinkler system or a partial automatic fire sprinkler system to the domestic water supply system for a building shall be protected against backflow conditions in accordance with s. COMM 82.41.

(a) If a reduced pressure principle backflow preventer or a reduced pressure detector backflow preventer is used as the type of cross connection control, plans for the device shall be submitted for review in accordance with s. COMM 82.20 (1).

(b) Cross connection control devices shall be tested in accordance with s. COMM 82.21 (3).

COMM 51.24 FIRE ALARM SYSTEMS.

Interior fire alarm systems required under ss. COMM 54.17, 56.19 and 57.17 shall be designed and constructed in conformity with NFPA 72 and the following requirements:

(1) All such alarm systems shall consist of operating stations on each floor of the building, including the basement, with bells, horns, or other approved sounding devices which are effective throughout the building. The system shall be so arranged that the operation of any one station will actuate all alarm devices connected to the system except in the case of a presignal system. Fire alarms shall be readily distinguishable from any other signalling devices used in the building. A system designed for fire alarm and paging service may be used if the design is such that fire alarm signals will have precedence over all others;

As described in NFPA 1993-72-2-4.1, a presignal system is one which may have a feature where initial fire alarm signals will sound only in department offices, control rooms, fire brigade stations, or other central locations and where human action is subsequently required to activate a general alarm, or a feature where the control equipment delays general alarm by more than one minute after the start of the alarm processing. Where there is a connection to a remote location, it shall activate upon initial alarm signal.

(a) In all buildings where a fire alarm system and a complete automatic sprinkler system are required, a water flow detecting device shall be provided to actuate the fire alarm system.

(2) Every fire alarm system shall be electrically operated or activated by noncombustible, nontoxic gas. Electrically operated systems shall be operated on closed circuit current under constant electrical supervision, so arranged that upon a circuit opening and remaining open or in case of a ground or short circuit in the ungrounded conductor, audible trouble signals will be given instantly. Gas-activated systems shall be mechanically supervised and under constant gas pressure, so arranged that in case of a pressure drop an audible trouble signal will be given instantly. Means shall be provided for testing purposes;

(3) (a) Except as provided in par. (b), coded fire alarm systems shall be provided in buildings more than 3 stories in height and the systems shall be so arranged that the code transmitted shall indicate the location and story of the structure in which the signal originated.

(b) 1. The department shall approve noncoded continuous sounding fire alarm systems under constant automatic supervision in apartment buildings.

2. The department shall approve noncoded continuous or march time sounding fire alarm systems with electrically supervised enunciator panels that indicate the location and the story of the structure in which the signal originated.

3. The department shall approve fire alarm and communication systems for high rise construction as specified in s. COMM 52.01 (2) (e).

(4) Operating stations shall be prominently located in an accessible position at all required exit doors and required exit stairways. Operating stations shall be of an approved type and shall be conspicuously identified. All such operating stations shall be of a type, which after being operated, will indicate that an alarm has been sent therefrom until reset by an authorized means. (Operating stations having a "Break Glass" panel will be acceptable. On coded systems having a device to permanently record the transmission of an alarm, "Open Door" type stations may be used). The fire alarm operating stations shall be mounted not less than 3 feet nor more than 4 feet above the finished floor as measured from the floor to the center of the box;

As a general guideline, most fire departments accept pull stations within 5 feet of an exit door. The stations should be inside the building and readily apparent to occupants exiting the building.

(5) All alarm systems shall be tested at least once a month and a record of the tests shall be kept;

(6) Existing fire alarm systems that are effective in operation will be accepted if approved by the department;

(7) The gas for operation of noncombustible, nontoxic gas activated fire alarm systems shall be supplied from approved pressure cylinders on the premises. The cylinders shall have sufficient capacity and pressure to properly operate all sounding devices connected to the system for a period of not less than 10 minutes. Cylinders shall be removed for recharging immediately after use and shall be replaced by fully charged cylinders;

(8) Spare cylinders shall be kept on the premises at all times for immediate replacement and separate cylinders for testing shall be incorporated in the system;

(9) Tubing in connection with non-combustible, nontoxic gas activated fire alarm systems shall be installed in rigid metal conduit, flexible metal conduit, or surface metal raceways where subject to mechanical injury. Noncorrosive metallic tubing not less than 3/16" in diameter which will withstand a bursting pressure of not less than 500 pounds per square inch shall be used. The maximum length of 3/16" tubing shall not exceed 300 feet between charged cylinders. All tubing and other component parts shall be installed by skilled workers in accordance with the provisions of this code; and

Note: See Wisconsin State Electrical Code, Volume 2, ch. COMM 16.

(10) MAINTENANCE. All fire alarm systems shall be maintained in accordance with NFPA 72.

COMM 51.245 SMOKE DETECTORS.

(1) GENERAL REQUIREMENTS. All smoke detectors shall be approved by the department and shall comply with the provisions of NFPA 72.

(2) INSTALLATION.

(a) 1. Except as provided under subd. 2., smoke detectors and smoke detector systems shall be installed in accordance with the provisions of NFPA 72 and in accordance with the manufacturer's directions and specifications.

2. Residential occupancies shall have smoke detectors provided as specified in s. COMM 57.16 or 66.49.

Question: *May wireless smoke detectors be used?*

Answer: *COMM 51.25 (4) adopts NFPA 72 which in 2-2.2 indicates, "For wireless systems, compliance with this standard shall require the use of equipment specifically listed for the purpose." Thus, wireless detectors may be used if specifically listed for that purpose.*

(b) Except as provided in s. COMM 57.16 (2) (b), all smoke detectors interconnected with each other or with the manual fire alarm system shall be installed in accordance with the provisions of NFPA 72A. Where smoke detectors are interconnected with the manual fire alarm system, the smoke detectors shall be wired in accordance with the provisions specified in s. COMM 16.34.

(3) MAINTENANCE. Smoke detectors shall be maintained in accordance with NFPA 72 and the following requirements::

All smoke detectors and smoke detection equipment whether required by the code or not must be maintained in an operable condition. In lieu of maintaining smoke detectors or smoke detection

equipment, this equipment may be removed if the detection equipment is not required by code. Local fire officials should be contacted prior to removal and their permission obtained.

(a) The owner shall be responsible for maintaining the smoke detectors and the smoke detection system in good working order;

(b) Tenants shall be responsible for informing the owner, in writing, of any smoke detector malfunction, including the need for a new battery;

(c) The owner shall have 5 days upon receipt of notice from the tenant to repair or replace the smoke detector or replace the battery; and

(d) The owner shall furnish to the tenant written notice of the responsibilities of the tenant and the obligations of the owner regarding smoke detector maintenance.

COMM 51.25 INCORPORATION OF STANDARDS BY REFERENCE.

(1) CONSENT. Pursuant to s. 227.21, Stats.; the attorney general and the revisor of statutes have consented to the incorporation by reference of the standards listed in sub. (4).

(2) COPIES. Copies of the adopted standards are on file in the offices of the department, the secretary of state and the revisor of statutes. Copies of the standards may be purchased through the respective organizations listed in Tables 51.25-1 to 51.25-21.

(3) INTERIM AMENDMENTS. Interim amendments of the adopted standards shall have no effect in the state until such time as this section is correspondingly revised to reflect the changes.

(4) ADOPTION OF STANDARDS. The standards referenced in Tables 51.25-1 to 51.25-21 are hereby incorporated by reference into this chapter.

Note: The tables in this section provide a comprehensive listing of all of the standards adopted by reference in this code. For requirements or limitations in how these standards are to be applied, refer to the code section that requires compliance with the standard.

***Question**: What standard may be applied when installing heat detectors in an elevator shaft to activate the disconnecting means?*

***Answer:** Either the NFPA 72E-1987 or NFPA 72-1993 may be used. Whichever standard is used, it must be used in its entirety.*

TABLE 51.25-1

AA	Aluminum Association 900 19th Street NW Washington, D.C. 20006
Standard Reference Number	Title
SAS-30	Specifications for Aluminum Structures Aluminum Construction Manual, Section 1, 1986.

TABLE 51.25-2

ACI	American Concrete Institute P.O. Box 19150 Detroit, Michigan 48219
Standard Reference Number	Title
1. 318-89 (Revised 1992)	Building Code Requirements for Reinforced Concrete.
2. 318.1-89 (Revised 1992)	Building Code Requirements for Structural Plain Concrete and Commentary.
3. 530-88/ASCE 5-88	Building Code Requirements for Masonry Structures
4. 530.1-88/ASCE 6-88	Specifications for Masonry Structures

TABLE 51.25-3

AIA	The American Institute of Architects Order Department 9 Jay Gould Court P.O. Box 753 Waldorf, MD 20601
Standard Reference Number	Title
R673	Guidelines for Construction and Equipment of Hospital and Medical Facilities, 1987 edition.

TABLE 51.25-4

AISC	American Institute of Steel Construction 400 North Michigan Avenue Chicago, IL 60611
Standard Reference Number	Title
S326	Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, with Commentary, November 1, 1978, with supplement #1.

TABLE 51.25-5

AITC	American Institute of Timber Construction 11818 S.E. Mill Plain Blvd., Suite 415 Vancouver, Washington 98684
Standard Reference Number	Title
1. 117.87	Design Standard Specifications for Structural Glued Laminated Timber of Softwood Species
2. 119-85	Standard Specifications for Hardwood Glued Laminated Timber

TABLE 51.25-6

AISI	American Iron and Steel Institute 1133 15th Street, N.W. Suite 300 Washington, D.C. 20005
Standard Reference Number	Title
1. SG-671	Specification for the Design of Coldformed Steel Structural Members, August, 1986.
2.	Manual for Structural Applications of Steel Cables for Buildings, 1973.

TABLE 51.25-7

ANSI	American National Standards Institute, Inc. 1430 Broadway New York, New York 10018
Standard Reference Number	Title
1. Z21.10.1-1993	Gas Water Heaters, Volume I, Storage Water Heaters with Input Ratings of 75,000 Btu per Hour or Less.
2. Z21.10.3-1993	Gas Water Heaters, Volume III, Storage, with Input Ratings Above 75,000 Btu per Hour, Circulating and Instantaneous Water Heaters.
3. Z21.47-1993	Gas-Fired Central Furnaces (except Direct-Vent Central Furnaces).
4. Z83.4-1991, with Z83.4a-1992 Addendum	Direct Gas-Fired Make-up Air Heaters.
5. Z83.8-1989, with Z83.8a-1990 and Z83.8b-1992 Addendum	Gas Unit Heaters.

TABLE 51.25-7
(Continued)

ANSI	American National Standards Institute, Inc. 1430 Broadway New York, New York 10018
Standard Reference Number	Title
6. Z83.9-1990	Gas-Fired Duct Furnaces. Direct Gas-Fired Industrial Air Heaters.
7. Z83.18-1990, with Z83.18a-1991 Addendum	Safety Glazing Materials Used in Buildings.
8. Z97.10-1994	ANSI/AAMA Aluminum Poly (Vinyl Chloride) (PVC) Prime Windows and Glass Doors.
9. 101-93	ANSI/NWWDA Wood Windows.
10. I.S.2-87	ANSI/NWWDA Wood Sliding Patio Doors.
11. I.S.3-88	

TABLE 51.25-8

APA	American Plywood Association P.O. Box 11700 7011 South 19th Street Tacoma, Washington 98460
Standard Reference Number	Title
1. PS 1-83U.S.	Product Standard for Construction and Industrial Plywood, Revised October, 1988.

TABLE 51.25-9

ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. 1791 Tullie Circle, NE Atlanta, Georgia 30329
Standard Reference Number	Title
1. 81850	Handbook of Fundamentals, 1993.
2. 52-76	Methods of Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter
3. 90.1-1989	Energy Efficient Design of New Buildings Except Low Rise Residential Buildings.

TABLE 51.25-10

ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, Pennsylvania 19103
Standard Reference Number	Title
1. A6-87d	General requirements for rolled steel plates, shapes, sheet piling and bars for structural use.
2. A36-87	Structural steel.
3. A82-85	Plain steel wire for concrete reinforcement.
4. A116-87	Zinc-coated (galvanized) steel woven wire fence fabric.
5. A153-82 (1987)	Zinc coating (hot-dip) on iron and steel hardware.
6. A615-87a	Deformed and plain billet-steel bars for concrete reinforcement.
7. A616-87	Rail-steel deformed and plain bars for concrete reinforcement.
8. A617-87	Axle-steel deformed and plain bars for concrete reinforcement.
9. C22-83	Gypsum.
10. C25-88	Chemical analysis of limestone, quicklime, and hydrated lime.
11. C34-84	Structural clay load-bearing wall tile.
11a. C36-91	Specification for gypsum wallboard.
12. C39-86	Compressive strength of cylindrical concrete specimens.
13. C42-84a	Obtaining and testing drilled cores and sawed beams of concrete.
14. C50-86	Sampling, inspection, packing, and marking of lime and limestone products.
15. C55-85	Concrete building brick.
16. C56-71 (1986)	Structural clay non-load-bearing tile.
17. C57-57 (1983)	Structural clay floor tile.
18. C62-87	Building brick (solid masonry units made from clay or shale).
19. C67-87	Sampling and testing brick and structural clay tile.
20. C90-85	Hollow load-bearing concrete masonry units.
21. C91-87a	Masonry cement.
22. C97-83	Absorption and bulk specific gravity of natural building stone.
23. C99-87	Modulus of rupture of natural building stone.

TABLE 51.25-10
(Continued)

ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, Pennsylvania 19103
Standard Reference Number	Title
24. C110-87	Physical testing of quicklime, hydrated lime, and limestone.
25. C140-75 (1980)	Sampling and testing concrete masonry units.
26. C144-87	Aggregate for masonry mortar.
27. C145-75 (1981)	Solid load-bearing concrete masonry units.
28. C150-86	Portland cement.
29. C170-87	Compressive strength of natural building stone.
30. C177-85	Test method for steady-state heat flux measurements and thermal transmission properties by means of the guarded-hot-plate apparatus.
31. C207-79 (1984)	Hydrated lime for masonry purposes.
32. C236-87	Test method for steady-state thermal performance of building assemblies by means of a guarded hot box.
33. C270-88	Mortar for unit masonry.
34. C317-87	Gypsum concrete.
35. C335-84	Test method for steady state heat transfer properties of horizontal pipe insulations.
36. C457-82a	Microsopical determination of air-void content and parameters of the air-void system in hardened concrete.
37. C471-87	Chemical analysis of gypsum and gypsum products.
38. C472-84	Physical testing of gypsum plasters and gypsum concrete.
39. C473-87a	Physical testing of gypsum board products and gypsum lath.
40. C476-83	Grout for reinforced and nonreinforced masonry.
41. C518-85	Test method for steady-state heat flux measurements and thermal transmission properties by means of the heat flow meter apparatus.
42. C652-87a	Hollow brick (hollow masonry units made from clay or shale).
43. C666-84	Resistance of concrete to rapid freezing and thawing.
44. C952-86	Bond strength of mortar to masonry units.

TABLE 51.25-10
(Continued)

ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, Pennsylvania 19103
Standard Reference Number	Title
45. C956-81 (1986)	Installation of cast-in-place reinforced gypsum concrete.
46. C976-82	Test method for thermal performance of building assemblies by means of a calibrated hot box.
47. D245-81	Establishing structural grades and related allowable properties for visually graded lumber.
48. D635-81	Rate of burning and/or extent and time of burning of self-supporting plastics in a horizontal position.
49. D1037-87	Evaluating the properties of wood-base fiber and particle panel materials.
50. D1143-81 (1987)	Testing piles under static axial compressive load.
51. D1929-77 (1985)	Ignition properties of plastics.
52. D2843-77	Density of smoke from the burning or decomposition of plastics.
53. D4099-87	Specification for polyvinyl chloride (PVC) prime windows.
54. E72-80	Conducting strength tests of panels for building construction.
55. E84-87	Surface burning characteristics of building materials.
56. E108-87	Fire tests of roof coverings.
57. E119-88	Fire tests of building construction and materials.
58. E136-82	Behavior of materials in a vertical tube furnace at 750°C.
59. E152-81a	Fire tests of door assemblies.
60. E163-84	Fire tests of window assemblies.
61. E283-84	Rate of air leakage through exterior windows, curtain walls and doors.
62. E447-84	Compressive strength of masonry prisms.
63. E648-88	Critical radiant flux of floor covering systems using a radiant heat energy source.
64. E814-94b	Standard Test Method for Fire Tests of Through-Penetration Fire stops.

TABLE 51.25-11

AWS	American Welding Society P.O. Box 351040 Miami, Florida 33135
Standard Reference Number	Title
1. D1.1-88	Structural Welding Code-Steel
2. D1.3-89	Structural Welding Code-Sheet Steel

TABLE 51.25-12

AWPA	American Wood Preservers Association P.O. Box 286 Woodstock, Maryland 21163-0286
Standard Reference Number	Title
1. C1-1993	All Timber Products
2. C2-1988	Lumber, Timbers, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes
3. C4-1989	Poles - Preservative Treatment by Pressure Processes
4. C9-1993	Plywood

TABLE 51.25-13

AWPB	American Wood Preservers Bureau P.O. Box 5283 Springfield, Virginia 22150
Standard Reference Number	Title
1. LP-2 1988	Standards for Softwood Lumber, Timber and Plywood Pressure Treated with Water-Borne Preservatives for Above Ground Use.
2. LP-22 1988	Standards for Softwood Lumber, Timber and Plywood Pressure Treated with Water-Borne Preservatives for Ground Contact Use.
3. FDN 1988	Quality Control Program For Softwood Lumber, Timber and Plywood Pressure Treated With Water-Borne Preservatives, For Ground Contact Use in Residential and Light Commercial Foundations.

TABLE 51.25-13M

DOE	U.S. Department of Energy U.S. Government Printing Office Washington, DC 20585 Telephone: 202/512-1800
Standard Reference Number	Title
1. 21 CFR, Section 1002.10 (1994)	None
2. 47 CFR, Part 5 (1993)	Experimental Radio Services

TABLE 51.25-14

FM	Factory Mutual Research Corporation 1151 Boston-Providence Turnpike Norwood, Mass. 02062
Standard Reference Number	Title
4450, Revised Aug. 5, 1977	Approval Standard for Class I Insulated Steel Deck Roofs.

TABLE 51.25-15

GA	Gypsum Association 810 First Street NE, #510 Washington, DC 20002
Standard Reference Number	Title
GA-600-88	Fire Resistance Design Manual

TABLE 51.25-16

NiDI	Nickel Development Institute 15 Toronto Street, Suite 402 Toronto, Ontario, Canada M5C 2E3
Standard Reference Number	Title
9023	Stainless Steel Cold-Formed Structural Design Manual, 1974 edition

TABLE 51.25-17

NFPA	National Fire Protection Association One Batterymarch Park P.O. Box 9101 Quincy, Massachusetts 02169-9101
Standard Reference Number	Title
1. 10-1998	Standard for Portable Fire Extinguishers.
2. 13-1996	Standard for the Installation of Sprinkler Systems.
3. 13R-1996	Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height.
4. 15-1996	Standard for Water Spray Fixed Systems for Fire Protection.
5. 20-1996	Standard for the Installation of Centrifugal Fire Pumps.
6. 22-1996	Standard for Water Tanks for Private Fire Protection.
7. 24-1995	Standard for the Installation of Private Fire Service Mains and Their Appurtenances.
8. 25-1998	Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.
9. 31-1997	Standard for the Installation of Oil-Burning Equipment.
10. 54-1996	National Fuel Gas Code.
11. 72-1996	National Fire Alarm Code.
12. 90A-1996	Standard for the Installation of Air Conditioning and Ventilating Systems.
13. 96-1994	Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment.
14. 211-1996	Standard for Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances.
15. 231-1998	Standard for General Storage.
16. 231C-1998	Rack Storage of Materials.

TABLE 51.25-17M

NFRC	National Fenestration Rating Council 962 Wayne Ave., Suite 750 Silver Spring, Maryland 29010
Standard Reference Number	Title
1. 100-91	Procedure for Determining Fenestration Product Thermal Properties.
2. LAP1-92, PCP1-92 and CAP1-92	Fenestration Thermal Performance Rating Certification and Labeling Program.

TABLE 51.25-18

NFiPA	National Forest Products Association 1250 Connecticut Avenue, N.W., #200 Washington, DC 20036
Standard Reference Number	Title
1. NDS	National Design Specification for Wood Construction, 1991 Edition, including Design Values for Wood Construction, a 1991 supplement to the 1991 Edition of National Design Specification for Wood Construction.
2. Technical Report No. 7	The Permanent Wood Foundation System, Basic Requirements, Revised January, 1987.

TABLE 51.25-18M

SMACNA	Sheet Metal and Air Conditioning Contractors National Association Vienna, Virginia 22180
Standard Reference Number	Title
	HVAC Duct Leakage Test Manual, 1st Ed, 1985.

TABLE 51.25-19

SJI	Steel Joist Institute Suite A 1205 48th Ave., North Myrtle Beach, South Carolina 29577
Standard Reference Number	Title
	Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders, 1988.

TABLE 51.25-20

TPI	Truss Plate Institute, Inc. 583 D'Onofrio Dr., Suite 200 Madison, Wisconsin 53719
Standard Reference Number	Title
TPI-85	Design Specification for Metal Plate Connected Wood Trusses, Including 1987 Supplement and Errata Addendum Sheet.

TABLE 51.25-21

UL	Underwriters Laboratories, Inc. Publication Stock 333 Pfingsten Road Northbrook, Illinois 60062
Standard Reference Number	Title
1. 181-1981	Factory-Made Air Ducts and Connectors, Including revisions dated March 19, 1994.
2. 1256-1985	Fire Test of Roof Deck Constructions.

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Chapter COMM 52

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Subchapter I — Fire Prevention, Detection and Suppression for High Rise Buildings

COMM 52.01 FIRE PREVENTION, DETECTION AND SUPPRESSION FOR HIGH RISE BUILDINGS.

(1) AUTOMATIC FIRE SPRINKLER SYSTEM. A complete automatic sprinkler system, as specified in s. COMM 51.23, shall be provided in every building more than 60 feet in height, the initial construction of which is commenced after July 2, 1974. The requirements of this section shall not apply to open parking structures as defined in s. COMM 62.10 (2).

(a) *Additions to existing buildings.* Building additions more than 60 feet in height shall have an automatic sprinkler system installed. The sprinkler protection shall be provided throughout the existing building unless the addition is separated from the existing building by a fire division wall as specified in s. COMM 51.02 (13). The requirements of this section shall not apply to open parking structures as defined in s. COMM 62.10 (2).

If an addition is proposed to a building which is currently under 60 feet high or which presently exceeds 60 feet in height but was constructed prior to 1974, and if the building addition is higher than 60 feet or increases the height of the existing building to more than 60 feet, the entire building, new addition and existing, must be sprinklered. The sprinkler protection may be omitted in the existing portions of the building only if the addition is separated from the existing building by a 4-hour fire division wall. A wall is a vertical element, therefore separation of the addition from the existing building by 4-hour rated floor assemblies is not permitted.

(b) *Substitute suppression systems.* When approved by the department, substitute automatic suppression systems may be used in lieu of a sprinkler system in areas where the use of water could cause unusual damage to equipment, or where water may have a limited effect or may be hazardous to use because of the nature of processes involved.

Note: The department will accept design and installation in accordance with the latest edition of the national fire protection association standards for special extinguishing systems.

(c) *Alternate methods.* When approved by the department, alternate methods of fire prevention, detection and suppression may be provided in lieu of a complete automatic sprinkler system.

The requirement to sprinkler buildings exceeding 60 feet in height is statutory. Petitions related to this code section are therefore difficult to process and approve. The department has processed petitions for high, special purpose buildings such as those where the occupancy is at low elevations and the building height is generated due to equipment only. Examples of this type of structure include power generating plants, paper mills, foundries, etc. Petitions to omit sprinkler protection from typical multistory buildings will probably not be approved unless an equivalency to the code requirement is clearly established.

Note 1: The department will request a position statement regarding the proposed method to be submitted by the fire chief of the municipality wherein the building is located.

Note 2: The department will consider alternate methods of fire prevention, detection and suppression to include, but not limited to, fire-resistive construction, compartmentation, automatic detection systems, interior finish restriction, and partial sprinkler protection.

(2) ADDITIONAL REQUIREMENTS FOR HIGH-RISE BUILDINGS. The following requirements apply to all buildings more than 100 feet in height or having more than 10 stories. Open parking structures and buildings used for low hazard industrial processes, including the production and distribution of gas, steam or electric power, foundries and similar uses which require unusual heights to accommodate cranes, special machinery or equipment, are exempt from the provisions of this subsection.

(a) *Smoke control.* Natural or mechanical ventilation for the removal of products of combustion shall be provided in every story and shall consist of one or more of the following methods. Controlling devices may be automatic or manual as approved by the local fire department.

1. Panels or windows in the exterior wall which can be opened from a location other than the fire floor. Such venting facilities shall be provided at the rate of at least 20 square feet per 50 lineal feet of exterior wall in each story, and distributed around the perimeter at not more than 50-foot intervals. Such panels shall be clearly identified as required by the fire department.

2. Openable windows in habitable rooms of residential units.

3. When an automatic sprinkler system is installed in compliance with s. COMM 51.23, the mechanical air handling equipment may be designed to assist smoke removal. Under fire conditions, the return and exhaust air shall be taken directly to the outside without recirculation to other sections of the building.

4. A mechanical ventilation system which will prevent the transfer of smoke from the fire source to other floors of the building. The design shall be substantiated by calculations or tests showing that a pressure differential of 0.10 inch of water column will be produced.

5. Any other design which will produce equivalent results.

(b) *Exit stairways.*

1. All stairways shall be pressurized. The pressure across each door shall be at least 0.15 but not more than 0.20 inch of water column with all doors closed. Pressurization shall be activated by the fire alarm system, the detection systems, and the sprinkler system. In lieu of pressurization, a smokeproof stair tower, as defined in s. COMM 51.17, will be accepted.

Note: The department will accept alternate designs which will produce equivalent results.

2. All stairway doors which are to be locked from the stairway side shall have the capability of being unlocked without unlatching upon a signal from the central control station.

(c) *Elevators.* Every floor level of the building shall be accessible to a fire department by means of one or more elevators. If the building is not provided with an automatic sprinkler system in accordance with s. COMM 51.23, the elevator lobby at each floor level shall be separated from the remainder of the building by an effective smoke barrier.

Note: See ch. COMM 18 for additional requirements pertaining to elevators.

(d) *Fire alarm and detection system.*

1. A manual fire alarm box shall be located adjacent to exit doors into stairway shafts and in every elevator lobby.

2. An approved system which will provide for automatic detection of products of combustion other than heat shall be installed in every air-handling equipment room, unless sprinklered, and in the return air portion of every air conditioning and mechanical ventilation system. Approved heat detectors may be installed in boiler rooms and furnace rooms in lieu of product of combustion detectors.

a. Detectors shall be located in the main return air and supply air ducts of each ventilation system and at each opening into a vertical return air shaft or duct.

b. The detectors shall actuate an alarm or signaling system and shut down the ventilation system except where automatic smoke control is incorporated in the system.

3. The manual alarm and automatic detection system shall conform to the Wisconsin State Electrical Code, Volume 2, ch. Comm 16 and NFPA 72.

4. Detectors shall conform to NFPA 72.

(e) *Alarm and communication systems.* The following alarm and communication systems shall be provided. The systems shall be supervised and exposed wiring shall be encased in a metal conduit.

1. Voice alarm system. The detection system, sprinkler water flow device and the fire alarm system shall actuate a prerecorded message or voice alarm capable of being operated from the central control station on a general as well as a selective basis to the area involved. The alarm shall be designed to be heard by all occupants within the building or designated portions.

2. Voice communication system. There shall be a voice communication system between the central control station and the following areas:

Note: The department will accept systems installed in accordance with NFPA No. 72.

a. Elevators, elevator lobbies, in stairways at every fifth floor, and all manual fire alarm boxes (2-way communication system);

b. Every office area exceeding 1,000 square feet in area (one-way address system); and

c. Each dwelling unit and hotel guest room (one-way address system).

3. Fire department communication system. A system providing 2-way communication shall be provided at all floor levels, stairways, the central control station, and other locations required by the fire department.

a. The system shall be designed so the fire department communication system will override the other communication systems.

b. Wiring shall be arranged so that open circuits or short circuits on individual floors will not interfere with communications on another floor.

4. Combined system. When approved by the local fire department, the fire department communication system may be combined with the voice communication system and the voice alarm system.

(f) *Central control station.* A central control station for fire department operations shall be provided in a location approved by the fire department. It shall contain the voice communication systems panel; fire detection and alarm system panels; status indicators and controls for elevators, smoke venting and air handling systems; controls for unlocking stairway doors; a public telephone; sprinkler valve and water flow detectors; and standby power controls. All fire alarm and water flow signals shall be transmitted directly to the systems indicated in s. COMM 52.01 (2) (d) 3.

(g) *Standby power and light.* An approved permanently installed standby power generating system shall be provided. The system shall be equipped with suitable means for automatically starting the generator set upon failure of the normal electrical service and for automatic transfer and operation of the required electrical functions at full power within 60 seconds of such normal service failure. System supervision with manual start and transfer features shall be provided at the central control station.

1. An on-premise fuel supply sufficient for not less than 2 hours full demand operation of the system shall be provided.

2. The power requirement shall be determined so as to provide service to, but not limited to the following:

a. Fire alarm system;

b. Exit and other emergency lighting;

c. Fire protection equipment;

Note: Standby power to service fire pumps may be omitted if approved by the local fire department.

d. Mechanical ventilation required by this section;

e. Fire department elevator; and

f. Communication systems.

(h) *Maintenance.* All communication, fire prevention, detection and suppression systems required under this section shall be tested and maintained in an operable condition. All installed automatic sprinkler systems shall be maintained pursuant to NFPA 25. Records of inspections, tests and maintenance as specified in NFPA 25 shall be kept and shall be made available, upon request, to the department or its authorized deputies. The local fire department shall be notified whenever the life safety systems are shut down or impaired and when placed back in service. The owner shall arrange for immediate and continual servicing or repair of the communication, fire prevention, detection and suppression systems until they are placed back in operation.

(i) *Floor level identification.* Each floor level or story shall be identified as to its number or name. Identification signs shall be posted in all elevator lobbies and in all required exit stairways.

Summary of Life Safety Features in High-Rise Buildings

	BUILDING HEIGHT	
	60' TO 100'	Over 100'
Structural integrity	Fire-resistive over 85'--Type A 85'--Type B 75' & 4 stories (COMM 54 only) Protected metal or Heavy timber	Fire-resistive, Type A
Sprinkler protection	Yes	Yes
Smoke control	Not required	Yes
Elevator for fire department access	See COMM 18 Elevator Code	Yes
Automatic fire/smoke detection	See COMM 57.16, 58.27, 58.65	HVAC smoke detector & see COMM 57.16, 58.27, 58.65
Manual fire alarm	See occupancy chapter	Yes
Communication; systems & central control station	Not required	Fire department & voice

Subchapter II — Automatic Fire Sprinkler Systems for Low Rise Buildings

COMM 52.011 PURPOSE, SCOPE AND APPLICATION.

(1) GENERAL. Pursuant to s. 101.14 (4) (a), (c) and (g), Stats., created by 1983 Wis. Act 295, this subchapter establishes automatic fire sprinkler system requirements for buildings under 60 feet in height which are used as public buildings or places of employment.

(2) GENERAL REQUIREMENT. Except as provided in sub. (3), automatic fire sprinkler systems shall be installed in the rooms, areas, locations, and building occupancies as specified in ss. COMM 52.012 and 52.013.

Note: See Comm 56.03 for additional system installation requirements.

(3) ALTERNATE METHODS. When approved by the department through the petition for variance process, alternate methods of fire protection, detection or suppression providing an equivalent degree of life safety protection may be provided.

Note: See s. COMM 50.25 for the procedure used for submitting a petition for variance to an administrative rule.

(4) SYSTEM DEFINITION AND STANDARD. The automatic fire sprinkler systems specified in this subchapter shall conform to the definition specified in s. COMM 51.01 (7a) and shall comply with the requirements specified in standards listed in s. COMM 51.27 (7)(b), (c), (cm), (d), (e), (f), (r) and (s).

Note 1: The definition of the term "automatic fire sprinkler system" in s. COMM 51.01 (7)(a) is taken from s. 145.01 (2), Stats.

(5) AREA SEPARATION WALLS.

(a) Buildings having an area exceeding the area limitations specified in s. COMM 52.013, may be constructed without complete automatic fire sprinkler systems provided the building is divided into areas less than the specified area limitations by at least 2-hour rated vertical fire separation walls. The fire separation wall shall extend from the foundation to the underside of the roof deck.

This code section, related to area separation walls based on the areas and usages specified in COMM 52.01 (3), should not be confused with the area limitation walls required by COMM 54.01, 57.02, or 59.12. Those code sections typically refer to 51.02 (13) calling for 4-hour fire-division walls based upon class of construction, sprinkler protection, number of stories, and fire department access. COMM 57.02 will under certain circumstances permit area division walls with ratings less than 4 hours. COMM 52.011 (5) addresses only separation of sprinklered and unsprinklered areas and area limitations based upon usage of the building or space as described in COMM 52.013.

1. Structural framing members may continue through or over the separation wall provided the framing and supporting elements are of noncombustible or one-hour fire-resistive combustible construction.

2. All openings in the separation wall shall be protected by fire-resistive door assemblies as specified in s. COMM 51.047.

(b) Where additions to buildings result in the area of the entire building exceeding the area limitations specified in s. COMM 52.013, one of the following conditions shall apply:

1. The existing building and the building addition shall be completely protected by an automatic fire sprinkler system;

2. The building addition shall be separated from the existing building by a 2-hour rated vertical fire separation wall. If the area of the building addition exceeds the area limitations specified in s. COMM 52.013, the building addition shall be completely protected by an automatic fire sprinkler system or the building addition shall be divided with 2-hour rated vertical fire separation walls as specified in par. (a); or

3. The existing building and the building addition shall be divided by 2-hour rated vertical fire separation walls as specified in par. (a).

(6) MULTIPLE-USE BUILDINGS. Where a building contains multiple occupancies or use areas and one occupancy or use area is required by s. COMM 52.013 to be protected by an automatic fire sprinkler system, one of the following conditions shall apply:

(a) The occupancy or use area protected by the automatic fire sprinkler system shall be separated from the unprotected areas by at least 1-hour fire-resistive rated construction; or

(b) The entire building shall be protected by an automatic fire sprinkler system.

Note: See ss. COMM 55.05 and 59.22 for occupancy separation requirements mandating fire-resistive separations of more than 1-hour rating.

(7) SEPARATION OF AREAS PROTECTED BY A PARTIAL AUTOMATIC FIRE SPRINKLER SYSTEM. Where the provisions of s. COMM 52.012 require the protection of an automatic fire sprinkler system, the protected area or room shall be enclosed with construction assemblies as specified in chs. COMM 54 to 62 and as designated in Table 51.03-A for the class of construction.

Note: This rule is intended to require an effective fire barrier between those portions of the building protected by the automatic fire sprinkler system and the adjoining unprotected portions. The fire barrier is not required to be of fire-resistive construction unless required for the occupancy, use or class of construction.

Separations of areas protected in accordance with COMM 52.012 from other areas of the building need not be by fire rated construction. Due to the wording of the note following this section, the department will accept any type of separating construction provided it is an effective smoke barrier. If the barrier also serves as an occupancy, class of construction, or hazard isolation separation, it shall comply with the most stringent requirements.

COMM 52.012 INDIVIDUAL ROOM, LIMITED AREA AND PARTIAL AUTOMATIC FIRE SPRINKLER SYSTEMS.

The rooms or areas within buildings as specified in subs. (1) to (5) shall be protected by an automatic fire sprinkler system.

COMM 52.012 and COMM 52.013 requirements stand alone. Where a conflict occurs, the most restrictive section governs.

(1) WINDOWLESS FLOOR LEVELS.

(a) Except as permitted in pars. (b) and (c), automatic fire sprinkler system protection shall be provided in all basements and floor levels where openings as specified in s. COMM 52.02 (2) are not provided.

Please see the discussion under COMM 52.02 (2).

(b) Automatic fire sprinkler system protection need not be provided in the following windowless floor level applications:

1. Windowless floor levels of 2500 square feet or less in total area and equipped with an approved smoke detection system which is:

a. Directly and permanently wired to a proper unswitched circuit; and

b. Interconnected to the building manual fire alarm system. If the building does not have a manual fire alarm system, the smoke detection system shall be capable of sounding an audible alarm which can be heard in all occupied areas of the building.

Question: *Can portions of a floor level have windows and the rest of that floor level meet an exception outlined in COMM 52.012 (1)(b)?*

Stated another way, is the 2500 square foot maximum applied to ONLY the windowless area OR to the entire floor level?

Answer: *The entire floor level must be counted in applying any of the exceptions noted under COMM 52.012 (1)(b). It is NOT acceptable to provide windows in a portion of the level, and then utilize one of the exceptions for the remaining area of the floor level.*

2. Communication equipment rooms separated from the remainder of the building by at least one-hour fire resistive construction and the room is equipped with an approved automatic fire detection and alarm system;

3. Windowless floor levels in ch. COMM 54 occupancies classified as low hazard and not exceeding 3000 square feet in area;

The plan examination staff will consider all occupancies as moderate hazard unless it is obvious that the occupancy is either high or low hazard. If the use is not obvious, it is the responsibility of the building designer and owner to submit substantiating data to classify an occupancy as a low hazard. See table in COMM 52.012 commentary for hazard classifications.

4. Windowless floor levels within individual living units of ch. COMM 57 occupancies;

5. Interior balconies and open mezzanine floors; and

6. Windowless floor levels in hospitals and nursing homes.

Note: See chs. COMM 58 and HSS 124 and 132 for additional requirements.

(c) One-story buildings with no floor levels below the first floor need not be provided with exterior wall openings other than the required exits. Except as provided in par. (b), enclosed mezzanine floor levels shall be protected by an automatic fire sprinkler system or provided with exterior wall openings.

(2) LAUNDRY AND TRASH COLLECTION ROOMS AND CHUTES. Automatic fire sprinkler system protection shall be provided in all laundry and trash chutes and terminal rooms. Automatic fire sprinklers shall be installed at the top of the chute and at alternate floor levels.

This section will require automatic sprinkler protection in laundries and trash collection rooms ***with chutes.*** *It is not the intent to require automatic sprinkler protection in clean linen storage rooms or other rooms without chutes. See (3) below for requirements for storage rooms without chutes.*

(3) STORAGE AREAS.

Question: *Are kitchen "prep" rooms considered storage rooms which must have sprinkler protection?*

Answer: *The owner may submit a letter to the department verifying the use and frequency of use of a "prep" room. If the department determines this is an active room, it will not be considered as storage.*

Question: *Are shop open mezzanines in schools considered as storage areas that are required to have sprinkler protection?*

Answer: *The intent of the code requirement is to provide automatic fire sprinkler protection in unoccupied storage rooms where a fire may originate and spread without the knowledge of the building occupants. Areas which are open and directly related to an ongoing activity do not pose the potential for undetected fires that a room dedicated to unattended general storage would. Thus, a shop open mezzanine which is utilized as an integral part of an active operation and which is open and easily visible from the main shop area will not be considered as a storage area for the purpose of COMM 52.012 (3) sprinkler protection requirements.*

(a) Except as provided in par. (b), automatic fire sprinkler system protection shall be provided in storage areas exceeding 100 square feet in area and located in chs. COMM 55, 56, and 57 occupancies. The areas of individual adjacent storage areas shall be considered cumulatively unless each storage area is separated from the adjacent area by at least 30-minute fire-resistive rated construction with openings protected by 20-minute rated fire doors.

(b) Automatic fire sprinkler system protection need not be provided in the following storage area applications:

1. Storage areas not exceeding 1500 square feet in area which are separated from the remainder of the building by at least one-hour fire-resistive construction and the area is equipped with an approved smoke detection system, which is:

   a. Directly and permanently wired to a proper unswitched circuit; and

   b. Interconnected with the building manual fire alarm system. If the building does not have a manual fire alarm system, the smoke detection system shall be capable of sounding an audible alarm which can be heard in all occupied areas of the building; and

Question: *Where are smoke detectors required to be located in this application?*

Answer: *The intent of providing the smoke detection system in this application is to provide early warning of smoke and/or fire that might originate in the storage area. Typically, storage areas are unattended and contain significant combustible fireload. The combined safety of an approved smoke detection system with fire-resistive construction around the storage area is intended to provide an equivalency to an automatic fire sprinkler system in the storage area.*

To meet the code intent and provide adequate warning of fire and/or smoke in the storage area, smoke detector heads must be placed to effectively monitor all compartments or sections of the storage area. Thus, the presence of walls, partitions and other compartmentalizing barriers within the storage area will mean that more smoke detector heads will be necessary unless some provision is made for free flow of air from the compartments to the smoke detector heads.

Centrally located smoke detectors in the aisle area of storage cubicles are acceptable IF an adequate area leading to each cubicle is open to allow air flow for a minimum of 18 inches from the ceiling. The opening must permit free air flow to the centrally located detector head(s).

If an area is NOT open to allow free flow of air to the smoke detector(s), then smoke detectors are required in each individual storage cubicle that is separated from the central detectors.

The spacing and square footage limits, distance to walls, etc., of the detectors in the above instances may not exceed those specified by the manufacturer of the equipment.

2. Storage areas located within individual living units of ch. COMM 57 occupancies.

(4) STAGE AREAS REQUIRING PROSCENIUM SEPARATIONS. Automatic fire sprinkler system protection shall be provided for all stage areas requiring proscenium separations within or behind the proscenium separation as follows:

The requirements of this section will apply only if a proscenium separation is required by Chapters COMM 55 or 56.

(a) Over the stage;

(b) Under the stage gridiron with side wall sprinkler heads rated at 135° having heat baffle plates. The heads shall be installed around the entire perimeter of the stage, except above the proscenium opening, at points not more than 30 inches below the gridiron, nor more than 6 inches below the baffle plate;

(c) Under all fly galleries;

(d) Under the stage;

(e) In all basements, workrooms, dressing rooms, store rooms and property rooms; and

(f) In toilet, lounge and smoking rooms.

COMM 52.013 SPECIFIED APPLICATIONS BY OCCUPANCY OR USE.

Except as provided in s. COMM 52.011 (5), a complete automatic fire sprinkler system shall be installed as specified in the following occupancies:

All specified area limits refer to gross building area. If the areas required to be sprinklered are separated from the rest of the building by the appropriate fire rating specified in COMM 52.011 (5) or 52.011 (6), this section does not require the entire building to be sprinklered.

(1) MERCANTILE OCCUPANCIES.

(a) Except as provided in par. (b), in mercantile occupancies where the area exceeds 15,000 sq. ft. per floor or 30,000 sq. ft. total area of all floors; or the height exceeds 3 stories;

Note that the requirement to sprinkler mercantile occupancies at 15,000 square feet is more restrictive than the area limitation rules calling for sprinklers found in COMM 54.01. A mercantile occupancy may be divided into areas less than those indicated by this section with 2-hour walls as permitted by COMM 52.011 (5) to avoid sprinkler or smoke detection. However, if the total area exceeds that specified by COMM 54.01, the building must either be sprinklered or divided by 4-hour fire-division walls.

(b) Mercantile occupancies without complete automatic fire sprinkler protection may be constructed up to the areas permitted in Table 54.01-1, but not exceeding 20,000 sq. ft. per floor provided the following conditions are satisfied:

1. The building is completely equipped with an automatic smoke detection system monitored by a fire alarm system company, proprietary or remote station service;

2. The distance to an exit does not exceed 100 feet; and

3. Street access for fire fighting vehicles is provided on at least 50% of the building perimeter.

(2) EXHIBITION ROOMS. In rooms having more than 12,000 sq. ft. of floor area which can be used for exhibition or display purposes.

Designers of large open buildings should review with their clients the usage of the building with respect to this code section. Although a skating rink may not necessarily require sprinkler protection, if that building is also used at times as an exhibition building, sprinkler protection will be required. The code requirements are not based on primary use, but rather most critical use.

(3) LIBRARIES AND MUSEUMS. In libraries and museums either of which exceed 15,000 sq. ft. area per floor.

Note that the 15,000 square feet is total area per floor in the building, not the area of the library or museum. Area separation walls as provided in COMM 52.011 (5) must be provided to divide the building into acceptable areas or sprinkler protection must be provided.

(4) RESTAURANTS, NIGHT CLUBS AND DANCE HALLS.

(a) In restaurants where the floor area exceeds 12,000 sq. ft. per floor or where the capacity is more than 1,000 persons.

The areas indicated in this section are total floor areas in the building, per floor, not the area used exclusively for the occupancies indicated. Area separation walls as provided in COMM 52.011 (5) must be provided to exclude other areas of the building from area determinations.

(b) 1. In buildings with rooms primarily used for dance halls or entertaining occupants who are drinking or dining and unseparated accessory uses where the total area exceeds 5,000 sq. ft. per floor or where the capacity is more than 300 persons.

Question: *Restaurant sprinkler protection is required when the floor area exceeds 12,000 square feet per floor or where the capacity is greater than 1,000 persons. However, nightclubs and dance halls require sprinkler protection when the area exceeds 5,000 square feet per floor or 300 persons. What differentiates between an establishment serving food and drinks with incidental entertainment and/or small dancing area and a nightclub or dance hall?*

Answer: *The code intent is to provide sprinkler protection for higher density areas used **primarily** for **dance halls or entertaining** occupants who are eating and/or drinking. It is not the intent to require sprinklers in every building that has dancing or that has background music, etc., in dining areas. The following definitions were derived in an effort to establish measurable criteria for dance halls and nightclub use.*

A building will be considered a dance hall if it has a dance area greater than 1,000 square feet. Multiple use buildings such as banquet halls will be considered dance halls if the non-carpeted floor area excluding corridors, passageways, and employee areas, exceeds 1,000 square feet.

*A building will be considered a nightclub if there is entertainment provided **and** there is a cover charge or minimum purchase necessary.*

2. The area of accessory rooms such as but not limited to kitchens, storage rooms and other use areas shall be included unless the accessory rooms are separated from the remainder of the building by at least one-hour fire-resistive construction.

Accessory Rooms – The provisions of subdiv. 2. apply to occupancies described in (a) and (b) above.

(5) DETENTION AND CORRECTION FACILITIES. In all detention and correctional facilities with a resident population of 6 or more.

(6) STORAGE OCCUPANCIES.

(a) 1. Except as provided in par. (b), in buildings having an area exceeding 20,000 sq. ft. and used for high-piled storage of moderate hazard contents as specified in subd. 2.

2. High-piled storage shall include moderate hazard combustible materials in closely packed piles more than 15 feet in height or moderate hazard combustible materials on pallets or in rack more than 12 feet in height.

This section is intended to apply to storage warehouses and large areas of buildings used for warehousing purposes. Smaller, incidental storage is covered under COMM 52.012 (3).

(b) 1. The automatic fire sprinkler system protection may be limited to the storage area of the building only provided the storage area is separated from the remainder of the building by at least 2-hour fire-resistive rated construction.

2. Automatic fire sprinkler system protection need not be provided in freezer warehouses.

Note: See s. COMM 54.01 (2)(c) for additional requirements.

(c) The automatic fire sprinkler protection required by this subsection shall be in accordance with NFPA 231 and 231C.

A52.012 HAZARD CLASSIFICATIONS. The following information is provided to assist building owners and designers in determining the hazard classifications of typical building usage or occupancy.

HAZARD CLASSIFICATION	DESCRIPTION OF FUEL LOAD	TYPICAL EXAMPLES
Low Hazard	Buildings or structures used for the manufacture or storage of noncombustible or low hazard materials that do not ordinarily burn rapidly, such as but not limited to: asbestos; chalk; nonalcoholic beverages; brick and masonry; ceramic products; gypsum; glass and metals; foods in noncombustible containers; fresh fruits and vegetables in nonplastic containers; dairy products in nonwax coated paper containers; beer or wine in metal or glass containers; electrical motors and coil; and fertilizer.	Metal fabricating and assembly; foundries; water pumping and wastewater treatment plants; fertilizer storage; telephone exchanges; freezer warehouses; storage in closed front metal cabinets; storage of noncombustible or low hazard materials on wood pallets or in paper cartons without significant amounts of combustible wrappings; and similar occupancies with slight combustibles.
Moderate Hazard	Buildings and structures used for the manufacture or storage of moderate hazard materials, which are likely to burn with moderate rapidity, but which do not produce either poisonous gases, fumes or explosives, such as but not limited to: cloth, burlap and paper bags; bamboo and rattan; canvas and leather belting; baskets; books and paper in rolls or packs; boots and shows; cardboard and cardboard boxes; clothing; cordage; furniture; furs; glue, mucilage, paste and size; linoleum; silk; soap;	Mercantile storage and display; offices; schoolrooms; auto showrooms; aircraft storage; light manufacturing; school shop areas; leather enameling or japanning operations; grain elevators with less than one million bushel bulk storage capacity; livestock shelters; fertilizer bagging operations; feed, flour and grist mills; lumber yards; motor vehicle repair shops; petroleum warehouses for storage of lubricating oils with a flash point of 200°F. or higher; photo engraving operations; public garages; stables; upholstering and mattress manufacturing; aircraft servicing; woodworking and millworking; bakeries; boat

Moderate Hazard	sugar; tobacco products; wax candles; athletic equipment; musical instruments; beverages containing more than 12% alcohol; furniture other than metal; business machines; electronics; and plastic products not classified as high hazard.	building operations; food processing; condensed and powdered milk manufacturing; paper mills or products; printing or publishing; refuse incinerators; and textile mills.
High Hazard	Buildings and structures used for the storage, manufacture or processing of: highly combustible or explosive products or materials which are likely to burn with extreme rapidity or which may produce poisonous fumes or explosions; highly corrosive, toxic, or noxious alkalis, acids or other liquids or chemicals producing flame, fumes, poisonous, irritant or corrosive gases; materials producing explosive mixtures or dusts or which result in the division of matter into fine particles subject to spontaneous ignition.	Ammunition, explosive and firework manufacture; artificial flowers and synthetic leather manufacture; celluloid and celluloid products; cotton batting and waste processes; dry cleaning establishments using or storing more than 3 gallons of flammable liquids with a flash point below 100°F. or more than 60 gallons of flammable liquids with a flash point between 100°F. and 140°F.; feather renovating; fruit ripening processes; grain elevators with one million bushel or more bulk storage capacity; hydrogenation processes; match manufacture and storage; metal enameling and japanning; nitro-cellulose film exchanges and laboratories; paint and varnish manufacture; petroleum manufacture; processing of paper or cardboard in loose form; pyroxylin product storage and manufacture; smoke houses; factories or warehouses where loose combustible fibers or dust are manufactured, processed, generated or stored; handling or using flammable liquids under conditions involving possible release of flammable vapors; and fabrication facilities and research and development areas in which hazardous production materials are used.

(7) HIGH HAZARD BUILDINGS.

(a) Except as provided in par. (b), an automatic fire sprinkler system shall be installed in all high hazard occupancies exceeding 3000 sq. ft. in floor area.

(b) When approved by the department, alternate types of fire protection or suppression systems as may be appropriate for the particular hazard may be provided.

Note: The department will request a position statement regarding the proposed method to be submitted by the fire chief of the municipality having jurisdiction.

Subchapter III — Windows and Fire Department Access Openings

COMM 52.02 WINDOWS.

(1) NATURAL LIGHT.

(a) Every room in which one or more persons live or sleep, shall be lighted by a skylight or skylights, or a window or windows opening directly upon a street or alley or upon a court on the same lot with the building, except as permitted s. COMM 57.13 (2).

In addition to skylights and windows, the department will accept glazed doors to satisfy this requirement. If doors are utilized, only the glass area in the door may be used not the entire door area.

(b) Windows shall not be required in storage rooms, factories, offices, mercantile facilities, educational facilities or areas where the nature of occupancy will not permit windows provided artificial lighting as specified in ch. Comm 73 is provided.

(2) FIRE DEPARTMENT ACCESS OPENINGS.

(a) *Application.* Any basement or any floor level which is not protected by an automatic fire sprinkler system shall be provided with at least 20 square feet of aggregate opening in each 50 lineal feet of exterior wall of that basement or floor level on at least one side of the building, except as permitted under s. COMM 52.012 (1). For the purpose of this requirement, openings 20 square feet in area spaced 100 feet apart and no more than 50 feet from the end of a wall shall satisfy the intent of this requirement.

Each 50-foot segment of wall must be analyzed with respect to openings. One opening may satisfy two wall segments. For instance, a 97-foot long wall with a 36-inch wide opening at the center will be in compliance as there would be no 50-foot long wall segment without an opening.

(b) *Dimensions.* Openings shall have minimum dimensions of not less than 22 inches by 42 inches. The bottom of the opening shall be not more than 48 inches above the floor.

(c) *Accessibility.* The openings shall be accessible to the fire department from the exterior and shall be unobstructed to allow firefighting and rescue operations.

The openings must be accessible to the fire department. If security for the opening is desired, such as grillage or bars over the windows or lockable grates over an area way, the local fire department should be contacted and approval obtained for the security devices.

1. a. A clear space not less than 5 feet in width measured perpendicular to the building wall shall be provided outside of access openings.

b. A stairway or ramp to grade not less than 3 feet in width shall be provided where the bottom of the opening is more than 4 feet below grade.

2. An interior stairway may serve as basement access if the stairway leads directly to an exterior door and is separated at the first story with one-hour fire-resistive rated construction and protected openings. The stairway may not serve any floor level above the first story.

When an interior stair is used for fire department access, the 75 feet to all points in the basement will be measured from the exterior opening.

3. A skylight or hatch may serve as a basement access opening if a ladder or stairs from the floor below is provided.

4. Access openings shall be doors, windows, glazed panels or other panels readily identifiable and openable from the outside. Access panels requiring the use of a key, special tools or devices for opening will be permitted if approved by the fire department having jurisdiction.

5. The fire department access shall open into the general area of the floor being served, where an aisle or passageway leading to the opening can be maintained clear of obstructions.

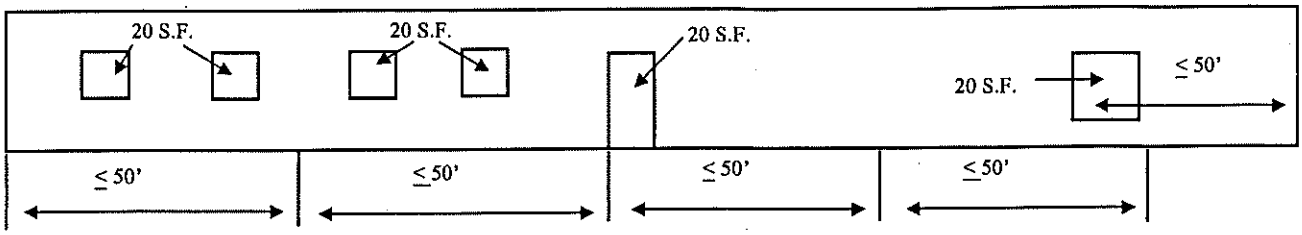
Note: An opening located within a tenant storage cubicle is not acceptable.

(d) *Number of openings required.* Except as provided in s. COMM 52.012 (1)(c), every floor level of a building more than 75 feet deep, measuring at right angles to the openings, shall have openings in that level on at least 2 sides of the building.

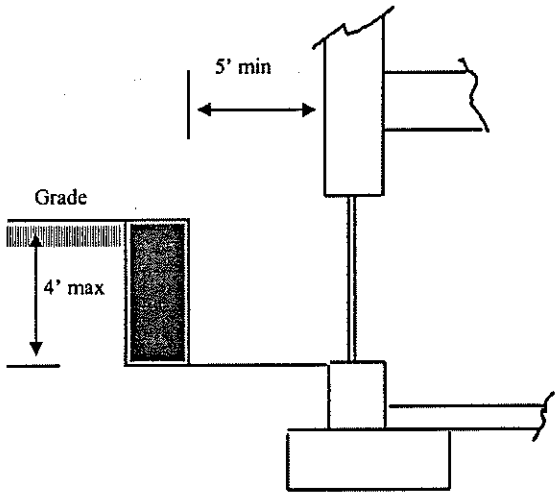
(e) *Locations.* Openings in the basement shall be located so any location in the basement is within 75 feet of an opening.

Based upon the width of the building, perpendicular to the wall having fire department access openings, another wall may be required to have fire department access openings. In no case will more than two of the building walls have to meet the full requirements for fire department access openings. However, if portions of the basement are beyond the 75 feet from an opening, additional openings, possibly in other walls of the building, may have to be provided.

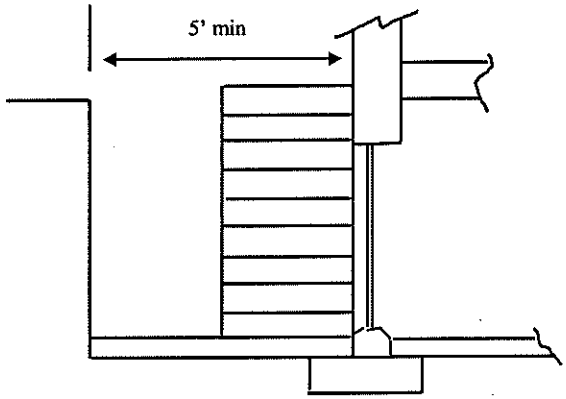
52.02 (2) FIRE DEPARTMENT ACCESS OPENINGS



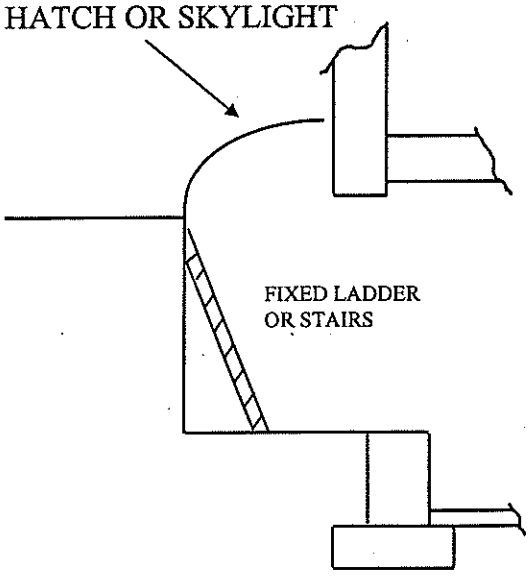
SECTION AT AREAWAY



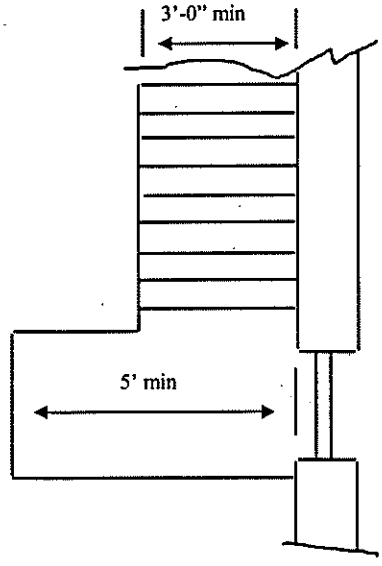
SECTION AT EXTERIOR STAIRWAY



HATCH OR SKYLIGHT



PLAN VIEW AT EXTERIOR STAIRWAY



Access Openings
COMM 52.02

Subchapter IV — Barrier-Free Design for the Physically Disabled

COMM 52.04 REQUIREMENTS FOR BARRIER-FREE ENVIRONMENTS.

(1) PUBLIC BUILDINGS AND PLACES OF EMPLOYMENT. Except for covered multifamily housing as specified in sub. (2), all public buildings and places of employment shall be designed to be accessible and usable by people with disabilities in accordance with the requirements of ch. COMM 69.

(2) MULTIFAMILY HOUSING. All covered multifamily housing as defined in s. COMM 57.77 (6) shall be designed and constructed in accordance with the requirements of ss. COMM 57.70 to 57.871.

Subchapter V — Courts

COMM 52.05 SIZE OF COURTS.

(1) In applying the following requirements, a building from 30 to 43 feet high shall be considered as having at least 3 stories, and each additional 13 feet shall be considered an additional story.

The width of a court is determined by the length of travel distance, within the court, from the building exit to an open space not less than 15 feet wide. The length of the court is not necessarily the total court length. The court must be ***uniform in width*** *for its entire length from the exit to the 15-foot wide space. The court does not get progressively wider. A court must be open to the sky with no obstructions. Therefore, balconies, decks, fire escapes, rescue platforms, etc., may not encroach into the required court width.*

(2) Outer lot line courts shall be not less than 5 feet wide for a court 2 stories or less in height and 40 feet or less in length, measured from the lot line to the wall of the building. For each additional story in height, the width of such court shall be increased one foot; and for each additional 15 feet or fraction thereof in length, the width of such court shall be further increased one foot.

(3) Outer courts between wings or parts of the same building, or between different buildings on the same lot, shall be not less than 6 feet wide for a court 2 stories or less in height and 40 feet or less in length. For each additional story in height, the width of such court shall be increased one foot, and for each additional 10 feet or fraction thereof in length, the width of such court shall be further increased one foot.

(4) Where outer courts or outer lot line courts open at each end to a street or other open space not less than 15 feet wide, the above lengths may be doubled.

(5) Inner lot line courts one story high shall be not less than 5 feet wide and not less than 45 square feet in area. Inner lot line courts 2 stories high shall be not less than 6 feet wide and not less than 60 square feet in area. For every additional story, every such inner lot line court shall be increased by at least one lineal foot in length and one lineal foot in its width.

(6) Inner courts shall be not less than 10 feet in width nor less than 150 square feet in area for courts 2 stories or less in the height; and for every additional story every such inner court shall be increased by at least one lineal foot in its length and one lineal foot in its width.

Building exits may not lead to an inner court, which is a court surrounded on all sides by walls, nor may they exit to an inner lot line court, which is a court surrounded on three sides by building walls

and an adjoining property line on the fourth side. Therefore, the size limitations for inner lot line courts and inner courts is based solely on ventilation needs.

Question: *Do the egress requirements for buildings, also apply to courts associated with commercial buildings?*

Answer: *There are various types of courts (see definitions) some of which are designed for occupant use.*

Those courts satisfying the egress requirement outlined in 52.21 must comply with all "building egress" requirements so as be "unobstructed" and therefore, usable by building occupants attempting egress.

Courts that have been designed and furnished for use should be arranged to meet all egress requirements the same as any other room.

In inner courts, the egress requirements for rooms will mandate the occupant have the ability to reenter buildings . . . unimpeded. This will cause security problems when the hardware on the doors leading back into the building have to meet the requirements of s. COMM 51.15 (3).

Inner courts which only provide light and ventilation (have not been designed for occupancy use) will not be subject to the various egress requirements.

Inner courts and inner lot line courts which have been designed for use by the building occupants will be subject to the same egress requirements as any other room in the building, including but not limited to door swing, exit hardware from court side, and two remote exit/exit accesses when the court has an occupant load exceeding 25 persons.

(7) Courts shall not be covered by a roof or skylight but the entire required area shall be open and unobstructed from the bottom thereof to the sky. No fire escape or stairway shall be constructed in any court unless the court be enlarged proportionately.

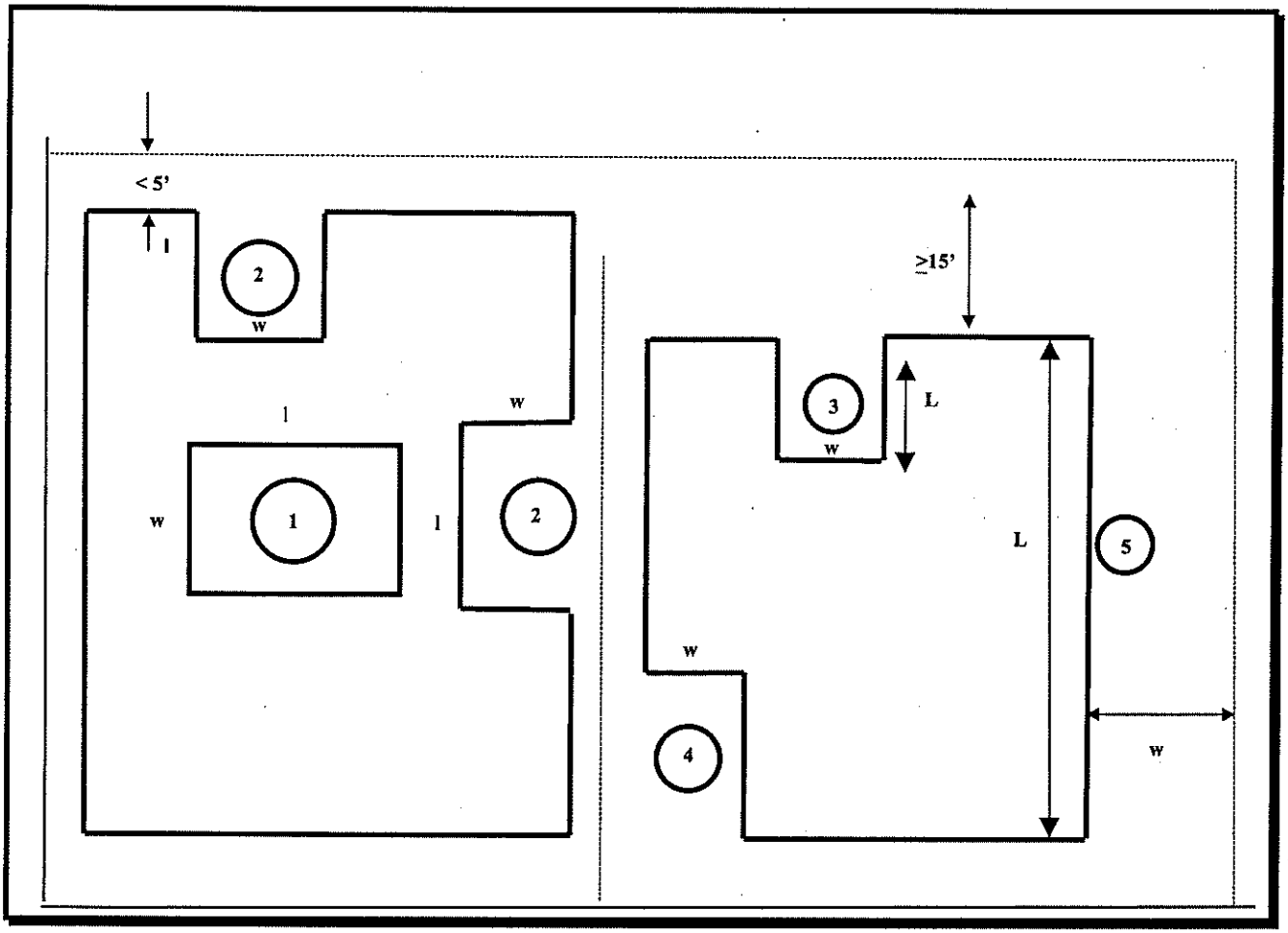
Question: *May cantilevers project into required court widths?*

Answer: *Courts shall not be covered by a roof or skylight but the entire required area shall be open and unobstructed from the bottom thereof to the sky. No fire escape or stairway shall be constructed in any court unless the court be enlarged proportionately.*

Court dimensions shall be measured from the protruding edges of cantilevers, including roof overhangs.

(8) Walls of inner courts whose least horizontal dimension is less than one-fourth the height, shall be faced with material with a permanent white surface or shall be painted white at least every 2 years.

(9) No buildings shall be altered or enlarged to encroach upon space reserved under this code for light and air on the lots or parcels of ground on which such building is erected.



w = Court width required by code
l = Court length required by code
N = Number of Stories
L = Length of building or distance between exit door and open space of min. 15' width

Light & vent courts:

1 INNER COURT
$w = 10 + (N-2)$
$l = 15 + (N-2)$

2 INNER LOT LINE COURT
$w = 6 + (N-2)$
$l = 10 + (N-2)$

Exit court if leads to street or alley:

3 OUTER COURT
$w^* = 6 + (N-2) + \frac{L-40}{10}$

4 OUTER LOT LINE COURT
$w^* = 5 + (N-2) + \frac{L-40}{15}$

5 OUTER LOT LINE COURT
$w^* = 5 + (N-2) + \frac{L-80}{30}$

** Not more than 15 feet required (becomes an open space)*

COMM 52.06 VENTILATION OF COURTS.

At the bottom of every shaft or inner court there shall be sufficient access to such shaft or court to enable it to be properly cleaned out. Every inner court which is required under s. COMM 52.02 and which is more than one story in height, shall have an intake for fresh air, leading from the street or

other open space. The area of such intake in square feet shall equal at least .002 of the number of cubic feet contained in the court, but such area need not be more than 50 square feet. Every intake shall be of not less than 2-hour fire-resistive construction and unless the intake is used as a passageway for persons, there shall be no openings into the same other than the inlet and outlet.

VENTILATION OF COURTS. The requirement for an air intake applies to inner courts and inner lot line courts where the court is provided for ventilation (typically Chapter COMM 57 occupancies). For courts having a relatively large area, where it can be shown that adequate air movement through the top opening will ventilate the court, the air intake may be omitted. A court having a least horizontal dimension equal to or exceeding the height may be assumed to have adequate air movement.

Subchapter VI — Atriums

COMM 52.07 ATRIUMS.

(1) SCOPE.

(a) All buildings, except those classified as high hazard, fully protected by an automatic fire sprinkler system may have atriums complying with the provisions of this section.

Compliance with the requirements of this section for atriums is one method whereby various floor levels can be connected by open shafts. Compliance with these requirements can be quite costly; therefore, if only two levels of the building are to be connected by an open shaft, it is suggested that the provisions of COMM 51.02 (11) and the provisions in the various occupancy chapters related to enclosure of stairs and shafts be reviewed as an alternative to creation of an atrium under this section of the code.

Note: See s. A 52.011 for further information regarding the classification and listing of high hazard buildings.

(b) All atriums, except as provided in ss. COMM 55.09, 58.06 (2), 60.34, 61.12 (4) and 62.27 shall comply with the provisions of this section.

(2) MINIMUM OPENING AND AREA. Atriums shall have a minimum opening and area as specified in Table 52.07-1.

TABLE 52.07-1
Atrium Opening and Area

Height in Floor Levels	Minimum Clear Opening[1] (Ft.)	Minimum Area (Sq.Ft.)
3-4	20	400
5-7	30	900
8 or more	40	1,600

The minimum clear opening size must be provided for the full height of the atrium such that a ball with a diameter of the size indicated can freely fall the entire extent of the atrium. Even though the individual floors involved in the atrium may have the required minimum clear opening, if those openings are offset to the degree a ball cannot freely fall through them, this requirement will not have been met.

[1]The specified dimensions are the diameters of inscribed circles whose centers fall on a common axis for the full height of the atrium.

(3) SMOKE CONTROL SYSTEM.

(a) *General.* A mechanically operated air-handling system shall be installed that will exhaust smoke either entering or developed within the atrium.

(b) *Exhaust openings.*

1. Exhaust openings shall be located in the ceiling or in a smoke trap area immediately adjacent to the ceiling of the atrium.

2. The lowest level of the exhaust openings shall be located above the top of the highest portion of door openings into the atrium.

(c) *Supply openings.* Supply openings shall be sized to provide a minimum of 50% of the exhaust volume and shall be located with the bottom of the opening within 18 inches of the floor of the lowest level of the atrium.

(d) *Supply air.*

1. When the height of the atrium is 55 feet or less, supply air may be introduced by gravity, provided smoke control is accomplished.

2. When the height of the atrium is more than 55 feet, supply air shall be introduced mechanically from the floor of the atrium and be directed vertically toward the exhaust outlets.

In the atriums over 55 feet in height or where tenant spaces above the second story are open to the atrium, supplemental supply air may be introduced at upper levels.

(e) *Systems activation and operation.*

1. The exhaust and supply system for the atrium shall operate automatically upon the actuation of either the automatic fire sprinkler system within the atrium or areas open to the atrium or by the actuation of 2 or more smoke detectors required by sub. (4), or both.

2. The exhaust and supply equipment shall also be manually operable by controls designed for fire department use.

3. The smoke-control system may be separate or integrated with other air-handling systems.

4. When the smoke-control mode is actuated, air-handling systems which would interfere with the smoke-control system shall be automatically shut down.

(f) *Smoke-control in spaces.* Spaces separated from the atrium but sharing a common wall shall be provided with a smoke-control system as follows:

When determining whether a space is separated from the atrium, (5) Enclosure of Atriums and (6) Openings in the Atrium Enclosure should be referenced. If the space is not separated by 1-hour construction with openings protected as required, the space will not be considered as separate from the atrium and the atrium smoke control system must be designed to protect that space. This may require that such spaces have appropriately sized louvers or vent openings between the space and the atrium.

If the space is properly separated, the space must be provided with its own smoke control system independent of the atrium smoke control system.

1. The mechanical air-handling equipment for the tenant space may be designed to accomplish smoke removal;

2. Upon activation of the smoke detection or automatic fire sprinkler system within the space, the return and exhaust air shall be moved directly to the outside without recirculation to other sections of the building; and

3. The air handling system shall provide a minimum of 6 air changes per hour of exhaust air for the tenant space involved.

(g) *Sizing of smoke-control systems.* The atrium smoke-control system shall exhaust not less than the following quantities of air:

1. Atriums of 600,000 cubic feet or less. a. Except as provided in subpar. b., a minimum of 6 air changes per hour but not less than 40,000 CFM for atriums having a volume of 600,000 cubic feet or less including the volume of any levels not physically separated from the atrium.

b. A lesser rate of air movement shall be acceptable provided it can be shown by test that smoke will not migrate beyond the perimeter of the atrium.

2. Atriums greater than 600,000 cubic feet. A minimum of 4 air changes per hour for atriums having a volume greater than 600,000 cubic feet including the volume of any levels not physically separated from the atrium.

The sizing of the smoke control system is based upon the total volume of the atrium. The volume of the atrium includes the atrium itself plus the volume of any space which is not separated from the atrium shaft in accordance with (5) Enclosure of Atriums and (6) Opening in the Atrium Enclosure.

(4) SMOKE DETECTION SYSTEM.

(a) 1. An interconnected smoke detection system which will automatically operate the atrium smoke-control system shall be installed at the perimeter and on the ceiling of the atrium and on the ceiling of each floor level that is open to the atrium.

2. Smoke detectors shall be located within 15 feet of the atrium on floor levels open to the atrium.

(b) Smoke detection systems and individual smoke detectors shall be located and installed in accordance with their listing from a nationally recognized testing laboratory and s. COMM 51.245.

(5) ENCLOSURE OF ATRIUMS.

(a) Except as provided in par. (b), atriums shall be separated from adjacent spaces by at least one-hour fire-resistive rated construction.

(b) Open exit balconies are permitted within the atrium.

(c) The separation between the adjacent space and the atrium as specified in par. (a) may be omitted on a maximum of any 3 floor levels, provided the remaining floor levels are separated as specified in par. (a).

Up to three floor levels may be open to the atrium. The three floor levels need ***not*** *be adjacent floor levels. All other floor levels must be separated from the atrium shaft by a minimum 1-hour construction. The separation is intended to separate the occupied portions of the the floor levels from the atrium shaft; therefore, balconies, walkways, bridges, etc., may be open on all floor levels provided the 1-hour separation is provided between those walkways and the occupied floor areas.*

(6) OPENINGS IN THE ATRIUM ENCLOSURE.

(a) *Door openings.*

1. Except as provided in subd. 2., openings in the atrium enclosure shall be protected by at least 3/4-hour, self-closing fire door assemblies as specified in s. COMM 51.047.

2. The doors may be left open if equipped with an automatic closing device activated by products of combustion other than heat.

These requirements regarding opening protection apply only to openings in the required, rated separation provided under (5). Openings to the three maximum floor levels which are not separated need not be protected in accordance with this section.

(b) *Fixed glazed openings.* Except as provided in subds. 1. and 2., fixed glazed openings shall be protected by at least 3/4-hour fire window assemblies as specified in s. COMM 51.048 and the total area of the openings shall not exceed 25% of the area of the common wall between the atrium and the room into which opening is provided.

1. In ch. COMM 57 residential occupancies, openings may be unprotected when the floor area of each guest room or living unit does not exceed 1000 square feet and each guest room or living unit has an approved exit not entering the atrium.

2. In all occupancies other than ch. COMM 57 residential occupancies, the tenant space may be separated from the atrium by a wired, tempered or laminated glass wall, in a gasketed frame so installed that the glazing system may deflect without breaking the glass before the automatic fire sprinkler system operates.

(7) EXITING.

(a) *Exit distance.* When a required exit enters the atrium space, the travel distance from the doorway of the tenant space to an enclosed stairway, horizontal exit, exterior door or exit corridor shall not exceed 100 feet. The maximum allowable exit distance, as required by chs. COMM 54 to 62 shall also be met.

(b) *Prohibitions.* Sleeping rooms of ch. COMM 58 health care facilities shall not be permitted to have required exits through the atrium.

(c) Except as provided in ss. COMM 54.08, 55.09 and 57.08, unenclosed stairs within the atrium may not serve as required exit stairs.

(8) OCCUPANCY SEPARATIONS.

(a) Except as provided in par. (b), at least a one-hour fire-resistive separation, as specified in s. COMM 51.08, shall be provided between different occupancies and each and every tenant space.

Occupancy separations as required by COMM 51.08 shall be provided between differing occupancies. Under certain circumstances however, the vertical portion of the occupancy separation may be omitted. This will require that floor/ceiling assemblies serving as occupancy separations must carry the appropriate rating but the walls facing the atrium which would normally be a part of the occupancy separation need not be rated. Please be advised that walls which serve as a part of an occupancy separation and which are not walls facing the atrium must carry a rating as required by COMM 51.08.

(b) The vertical portion of the occupancy separation adjacent to the atrium may be omitted between:

1. Chapter COMM 54 office and sales areas and ch. COMM 57 guest rooms and living units located on another level;

2. Chapter COMM 55 assembly halls without a stage and having an occupant load of less than 300 persons and ch. COMM 57 guest rooms and living units located on another level; and

3. Chapter COMM 54 office and ch. COMM 55 assembly halls without a stage and having an occupant load of less than 300 persons.

(9) STANDBY POWER. The smoke-control system for the atrium and the smoke-control system for the tenant space shall be provided with emergency standby power as specified in s. COMM 16.32 - 16.46, 16.50.

(10) INTERIOR FINISHES. The interior finish of walls and ceilings of the atrium and all unseparated tenant spaces as permitted in sub. (5)(c) shall be Class A. No reduction in class shall be permitted for automatic fire sprinkler system protection.

(11) ACCEPTANCE OF THE SMOKE-CONTROL SYSTEM. Before occupancy, the smoke-control systems shall be tested in an approved manner and shall show compliance with the requirements of this section.

A 52.07 (11) Acceptance of the atrium smoke control system. The following is a reprint of an approved test procedure:

Acceptance test procedure for the atrium smoke management system.

1. All testing shall be in the presence of a representative of the department.

2. All exhaust and supply-air systems shall be operationally balanced and tested. Complete air-balance reports shall be recorded on each piece of equipment, all exhaust inlets, and all supply outlets.

3. Each automatic initiating device shall be tripped to observe proper function. This test shall be performed on both normal and emergency power.

4. Each manual switch and override shall be tripped to observe proper function. This test shall be performed on both normal and emergency power.

5. All indicator lights shall display the appropriate detection and operating status.

6. Select a location on the first floor approximately 5 feet outside the perimeter of the atrium opening. The location shall be acceptable to the department's representative.

7. Prepare three two-minute smoke bombs.

8. Ignite all three smoke bombs. When they become fully active, manually activate the atrium smoke management system.

9. Observe and record the results.

10. After all smoke has been cleared, select an additional location on an upper level acceptable to the department's representative.

11. Prepare three more two-minute smoke bombs.

12. Ignite all three smoke bombs. When they become fully activated, again manually activate the atrium smoke management system.

13. Observe and record the results.

14. Acceptable performance shall be movement of the smoke from the source into the atrium and out through exhaust at the top of the atrium. Smoke migration down the corridors shall be limited to no more than a light haze at a point 25 feet from the source. Furthermore, the balconies around the perimeter of the atrium shall maintain a smoke-free zone.

15. Upon the successful completion of these tests, a signed and dated copy of the department's acceptance shall be filed with the test records and a copy shall be maintained with the quarterly test log.

16. A copy of this acceptance test procedure and all plans, specifications, and calculations for the building shall be maintained with the quarterly test log.

(12) INSPECTION OF THE SMOKE-CONTROL SYSTEM.

(a) All operating parts of the smoke-control systems shall be tested by an approved inspection agency or by the owner or designated agent or the smoke control system shall be fully supervised.

(b) The tests shall be made every 3 months and a log of the tests shall be kept. Fully supervised smoke control systems shall be tested at least annually.

(c) The log shall be on the premises and available for examination by department personnel or authorized deputies of the department.

Subchapter VII — Miscellaneous Provisions

COMM 52.19 GAS AND OIL LAMPS.

(1) Gas and oil lamps shall not be used where electricity is available, except within living units of apartment buildings.

(2) Gas and oil lamps shall be placed at least 6 feet above the floor level, at least 6 inches from any combustible partition or wall, and at least 2 feet (measured from top of flame) below any combustible ceiling unless properly protected by a metal shield with at least 2 inches of air space above. Swinging brackets shall be provided with a guard or stop so that the light cannot come nearer to the partition or wall than one foot. In aisles and public passageways, every such light shall be protected by an incombustible guard unless the light is at least 7 feet above the floor. Gas and oil lights shall be kept at least 2 feet from any drape or window curtain.

(3) Every gas supply main shall have a service cock outside of the building, so placed and maintained that it can be shut off at any time without entering the building.

COMM 52.20 ELECTRICAL WORK.

All electrical work shall conform to the requirements of the Wisconsin State Electrical Code, Volume 2, ch. COMM 16, of the department.

A-52.20 Chapter COMM 16, Wisconsin State Electrical Code, Volume 2, requires the installation of standby emergency power for certain occupancies; the following is a reprint of s. COMM 16.46 (1):

(1) Where required. Standby emergency power of a type recognized by NEC 700-12 (a), (b), (c) or (f) shall be provided as a source of supply for required exit lights, emergency lighting or power in occupancies where people are housed, assembled or confined with a capacity or area equal to or greater than those listed in Column B of Table 16.46.

TABLE 16.46

Occupancies Requiring Standby Emergency Power

	Column A Occupancy	Column B Calculated Capacity or Area
1.	Apartment buildings	50 bedrooms, including efficiency units
2.	Arenas	800 square feet (use seated space only)
3.	Art galleries	20,000 square feet
4.	Assembly halls such as church dining rooms and fellowship halls, dance halls, banquet halls, dining rooms, restaurants, taverns, night clubs, school and day care center multipurpose rooms, and similar occupancies	2,000 square feet
5.	Assembly halls with stage	1,400 square feet
6.	Auditoriums	1,400 square feet
7.	Banks	30,000 square feet
8.	Bowling alleys	200 persons based on 5 persons per alley plus number of spectator seats and 10 square feet per person for bar and dining areas
9.	Centers for developmentally disabled	20 inmate beds
10.	Children's homes	20 beds
11.	Community-based residential facilities	20 beds
12.	Convents	200 beds
13.	Dormitories, including those used in detention schools	200 beds
14.	Exhibition buildings	12,000 square feet
15.	Factories	30,000 square feet
16.	Field houses	800 square feet (use seated space only)
17.	Gymnasiums	200 persons based on 6 square feet per person for seated space and 15 square feet per person for unseated space
18.	Hospitals	20 patient beds
19.	Hotels	200 rooms
20.	Jails	20 inmate beds
21.	Lecture halls	1,400 square feet
22.	Libraries	200 persons based on 20 square feet per person for reading rooms and 100 square feet per person for balance
23.	Lodge halls	200 persons based on 6 square feet per person for seated space and 15 square feet per person for unseated space
24.	Motels	100 rooms
25.	Museums	20, 000 square feet
26.	Nursing homes	20 patient beds

27.	Office buildings	30,000 square feet
28	Rooming houses	200 rooms
29.	Skating rinks	2,000 square feet
30.	Stores	200 persons based on 30 square feet per person for first floor and 60 square feet per person for second floor and above
31.	Swimming pools (indoor)	450 square feet
32.	Theaters and theater lobbies	1,400 square feet (theater and lobby must be combined in determining total area)
33.	Warehouses	120,000 square feet

Note: For the design requirements for transformer vaults, see ch. E 450 of the Wisconsin State Electrical Code, Volume 2, ch. COMM 16.

COMM 52.21 LOCATION AND MAINTENANCE OF EXITS.

Every exit mentioned in ss. COMM 51.15 to 51.20, inclusive, shall lead to a street, alley or open court connected with a street. All such exits and all passageways leading to and from the same, shall be kept in good repair and unobstructed at all times.

All exits must be maintained in a clear and unobstructed condition. Typically, a 3'0" to 3'8" wide passageway must be provided leading to the exit. The exit and the pathway leading to the exit cannot be obstructed with stored materials, tables, chairs, or any other material which would obstruct or hinder exiting occupants. Snow must be removed from the exterior of exits if the snow obstructs operation of the door or, due to its depth, will hinder evacuation of the building. In particular, snow must be removed from fire escapes and rescue platforms including rescue platforms provided under the provisions of COMM 54.03 and 57.05.

COMM 52.22 REPAIRS.

Every building shall be kept in good repair and the roof shall be maintained to prevent leakage. All rainwater shall be so drained and conveyed to prevent dampness in the walls and ceilings.

Note: Public schools are required by s. 120.12 (5), Stats., to have annual building maintenance schedules, and are required by s. 121.02 (1) (i), Stats., to be safe and healthful. The inspections conducted by the department under s. COMM 56.21 include a review of these maintenance schedules.

Obvious building code violations noted during these inspections will be documented and referred to the local inspection authority, either building or fire, whichever is appropriate.

Inspections of all existing school buildings are required to be conducted at least once in a fire-year period. The department will inspect a portion of the school districts every five years. The results of these inspections will be included in DPI's standard (i) audit reports.

COMM 52.23 CLEANLINESS.

Every building, including connecting yards, courts, passages, areas or alleys, shall be kept clean, and shall also be kept free from any accumulation of dirt, filth, rubbish, garbage, or other matter.

COMM 52.24 RECYCLING SPACE.

(1) APPLICABILITY. All buildings under the scopes of chs. COMM 54 to 62 shall provide a separate room or designated space within or adjacent to the building for the separation,

temporary storage and collection of recyclable materials likely to be generated by the building occupants, under any of the following conditions:

The intent of the recycling rules, Act 355, is to assure public buildings designate adequate space for the separation, temporary storage and collection of recyclable materials likely to be generated by the building occupants and to effectively reduce the amount of solid waste disposed of in landfills. The law prohibits the landfilling and burning of various materials defined as recyclable materials; encourages the development of markets for post-consumer waste; and specifies the allocation of adequate space for the separation, temporary storage and collection of recyclable materials.

All public buildings built after the effective date of this rule and all buildings where an addition or alteration results in more than a 50% increase in area to comply with this rule are required to include a separate room or designated area for the separation, temporary storage and collection of recyclable materials.

The rules establish which public buildings must comply with this rule and specify the approximate size of the room or area designated for the separation, temporary storage or collection of recyclable materials. Recyclable materials include solid waste material prohibited for land disposal and incineration, that is separated, temporarily stored and collected. These materials include, but are not limited to, aluminum and glass containers, corrugated paper or container board, magazines, newspapers, office paper, foam polystyrene packaging, and plastic or steel containers.

(a) The construction of a new public building;

(b) An increase in the existing area of a public building which increases the gross floor area of the structure by 50% or more; or

(c) An alteration of 50% or more of the existing area of a public building that is 10,000 square feet or more in area.

Note: The collection and temporary storage of recyclable materials that are flammable or combustible is regulated by ch. COMM 14. Storage of liquids that are flammable or combustible is regulated by ch. COMM 10. Owners of buildings where these materials are stored should consult those chapters for isolation, removal, and storage standards.

(2) DESIGNATED SPACE. Designated space for the separation, temporary storage and collection of recyclable materials shall be provided within or adjacent to all buildings under sub. (1), except where a separate trash collection room is provided. In buildings where a trash collection room is provided, a clearly designated space for recyclables shall be provided.

APPENDIX C

When verified amounts of previously generated recyclable materials are available, the following may be used to determine adequate space for the separation, temporary storage and collection of recyclable materials:

One cubic yard should be allocated for each 200 pounds of newspaper and mixed paper.

One cubic yard should be allocated for each 80 pounds of mixed or commingled recyclable materials.

The guidelines in the following table are provided for determining adequate space allocation when verified amounts of previously recyclable materials are not available. These guidelines are based on accumulation of recyclable materials likely to be generated by the building occupants for one week and one month, respectively.

GUIDELINES FOR RECOMMENDED SPACE ALLOCATION
BY TYPE OF BUILDING OCCUPANCY[a]

Type of Building Occupancy	Space Allocation (cu. ft./1,000 sq. ft. floor area)	
	One Week	One Month
Assembly Hall, Theater	2.2	10.0
Child Day Care		
with meals served	4.5	20.0
without meals served	3.0	12.0
Detention and Correctional	13.5	60.0
Garage		
storage	0	0
repair	[b]	[b]
Health Care		
hospital	13.5	60.0
clinic, without meals served	8.0	36.0
nursing/rest home	4.5	20.0
Hotel/Motel		
without meals served	3.5	15.0
Industrial	[b]	[b]
Library	2.2	10.0
Mercantile		
department store, shopping mall	9.0	40.0
grocery	18.0	80.0
Museum, Art Gallery	2.2	10.0
Office	7.0	30.0
Residential, Multifamily Dwelling	9.0	40.0
Restaurant or Food Service	[c]	[c]
School, Places of Instruction	3.0	12.0
Warehouse	[b]	[b]

[a] This information is to be used only as a guide in determining space allocation. Space allocation may differ from the listed value when using verified amounts of previously generated recyclable materials.

[b] Varies with type of activity.

[c] Varies with number of meals served and type of meal service.

(3) ROOMS FOR SEPARATION, COLLECTION AND STORAGE.

(a) Separate rooms provided for the separation, collection and temporary storage of recyclable materials shall comply with s. COMM 52.012 (2).

(b) When an automatic fire sprinkler system is provided, the system shall be designed and installed in an acceptable manner, and material may not be placed closer than 18 inches below sprinkler deflectors or discharge orifices.

COMM 52.012 (2) sprinkler requirements only apply to rooms with chutes, otherwise COMM 52.012 (3) applies.

(c) for buildings regulated under ch. COMM 58, rooms provided for the separation, collection and temporary storage of recyclable materials shall comply with s COMM 58.24 or 58.62.

COMM 14 may have additional requirements. The following is a reprint of a relevant part of COMM 14.

COMM 14.20 Accumulation of waste. (1) GENERAL. (a) Accumulations of litter or combustible or flammable waste may not be permitted to remain longer than 24 hours in any court, yard, vacant lot, alley, parking lot or open space unless in closed metal, noncombustible or other approved containers.

(2) VEGETATION. All weeds, grass, vines or other growth which endangers property through the spread of fire shall be cut down and removed.

(3) STORAGE WITHIN BUILDINGS. (a) All combustible rubbish or waste material not stored in approved covered, metal or noncombustible containers and not located in rooms of at least one-hour rated fire-resistive construction shall be removed from the building at least once every 24 hours.

Note: This rule is not intended to apply to storage of waste paper at individual work stations for recycling purposes.

(b) Oily waste and oily rags, when not in actual use, shall be kept in listed self-closing metal waste cans, set firmly on 3-inch legs or approved noncombustible containers and located at least 10 feet from any combustible materials.

(c) All chemically-soiled wastes with the potential for spontaneous combustion shall be kept in listed self-closing metal waste cans until removed from the building.

(4) NUISANCE OR HAZARD. Storage of waste may not produce conditions which in the opinion and judgment of the fire chief will tend to create a nuisance or a hazard to the public safety.

COMM 14.21 Handling and storage of combustible materials. (1) HANDLING. Any person making, using, storing or having under their control any flammable or combustible materials shall, at the close of each day, cause all material which is not compactly baled and stacked in an orderly manner to be removed from the building or stored in a single portable metal bin of a size for one day's supply; in metal-lined, covered portable receptacles or bins; or in a hazard enclosure as specified in s. COMM 54.14.

(2) INSIDE STORAGE. (a) Combustible storage in buildings shall be orderly, shall be more than 2 feet from the ceiling, and shall be so located as not to endanger exit from the building. A minimum of 18 inches clearance shall be maintained between the top of storage and ceiling sprinkler deflectors.

(b) clearances between combustible materials and electric equipment shall be as specified in Section 110.16 of the National Electric Code as adopted by reference in ch. COMM 16.

Note: Structural support for safe floor loads shall be in accordance with s. COMM 53.11 (1)(d).

(4) STORAGE HEIGHT. The height of recyclable materials temporarily stored shall be limited so that stacked material is stable and secured against sliding or collapse.

Note: See ch. COMM 14 for more restrictive storage heights, where applicable.

(5) CLEARANCE.

(a) Containers for the collection or temporary storage or the space designated as a collection or storage point may not be located so as to limit the use of exits, exit passageways, stairways, fire escapes or areas normally used for safe egress for the building occupants or in such a manner as to obstruct normal movement of employes in the performance of their duties.

(b) Where mechanical equipment is used in the collection, separation, temporary storage or removal or recyclable materials, sufficient safe clearance shall be provided for equipment turning and passage.

(6) PROHIBITIONS. Storage of recyclable materials is prohibited within furnace or mechanical rooms. If designated space is adjacent to the building, the area provided may not be within 5 feet of combustible walls, wall openings or roof eaves.

Note: See ch. COMM 14 for more restrictive distances from storage of flammable and combustible materials to adjacent buildings and lot lines.

COMM 52.25 FIRE DIVISION WALL OR OCCUPANCY SEPARATION WALL IDENTIFICATION.

(1) PURPOSE. Pursuant to s. 101.135, Stats., the purpose of this section is to establish uniform standards for the identification of fire division walls or occupancy separation walls of 2-hour fire-resistive rating or greater on the exterior of buildings.

This section specifies the identification of fire walls, and the type of walls which need identification. The code includes the sign requirements, and where and how signs can be located.

This section applies only where a city, village, or town has adopted an ordinance that requires fire walls to be identified with signs.

(2) MUNICIPAL ORDINANCE. A city, village or town may by ordinance require owners to identify the location of a fire division wall or occupancy separation wall at the exterior walls of buildings with a sign. A sign may not be required to identify a fire division wall or occupancy separation wall:

(a) Abutting exterior walls of 2 or more buildings along streets in downtown areas;

(b) With a visible parapet from the street;

(c) Which extends above roofs and is an exterior wall of another part of a building; and

(d) In buildings more than 3 stories.

(3) DEFINITION. "Fire division wall or occupancy separation wall" means a wall extending from the lowest floor level to or through the roof and extending the full width or length of the building.

Note: See "fire division wall" as defined in s. COMM 51.01 (144)(b); fire division wall requirements in accordance with s. COMM 51.02 (13), or occupancy separation wall requirements in accordance with s. COMM 51.02 (20); and occupancy separation requirements in accordance with Table 51.08.

(4) SIGN REQUIREMENTS.

(a) *General.* The sign shall consist of 3 circles arranged vertically on the exterior wall marking the location of the fire division wall or occupancy separation wall and centered on the fire division wall or occupancy separation wall. The circles may be affixed directly to the surface of the building or may be placed on a background material which is affixed to the building.

(b) *Size of circle.* Each circle shall be the same size. The diameter of the circle shall be at least 1 1/2 inches, but no greater than 2 inches.

(c) *Spacing.* The circles shall be spaced equal distance apart. The maximum distance measured from the top of the uppermost circle to the bottom of the lowermost circle shall be 12 inches.

(d) *Color.* The color of the circle shall be limited to either red, amber (orange-yellow) or white (clear) and shall be reflective. The color of the circle shall contrast with the color of the background.

(5) LOCATION. The top of the sign shall be located on the face of the exterior wall of the building and located no more than 12 inches below the eave, roof edge, fascia, or parapet.

Subchapter VIII — Sanitation Requirements

COMM 52.50 TOILET ROOMS.

(1) Every place of employment and public building shall be provided with toilet rooms as specified in chs. COMM 54 to 62.

Every place of employment or public building must have sanitary facilities. The scope of this section is very broad and will include buildings such as park shelters, golf driving range buildings, athletic field bleachers, press boxes, etc. The department will not expect that sanitary facilities be provided within each building; however, sanitary facilities must be provided on the property and within a reasonable distance from the building. Utilization of toilets located on adjoining properties is not permitted.

(2) Entrances for toilet rooms shall be provided with doors or mazed passageways to ensure privacy to the users of the toilet rooms, except as permitted in ss. COMM 56.16 (1) and 60.15 (2)(a). If mazed passageways are employed in lieu of doors,:

The intent of the code is to assure toilet rooms are completely enclosed and separated from other uses in a manner which will ensure privacy for the users. Walls used for the general room enclosure should extend from floor to ceiling. The walls forming the mazed opening may be permitted to terminate at 7 feet above the floor.

(a) The passageways of the maze shall be at least 48 inches in width;

(b) The walls creating the maze shall be at least 6 feet 8 inches high;

(c) The maze shall prevent a direct view of the water closet compartments, urinals or lavatories from the outside entrance of the maze;

(d) The maze shall prevent an indirect view of the water closet compartments, urinals or lavatories from the outside entrance of the maze by means of mirrors located within the toilet room; and

(e) The toilet room shall be provided with an exhaust fan which is to be on continuously while the building is occupied, and which is to create a negative pressure within the toilet room with respect to the area outside the toilet room.

COMM 52.52 SEX DESIGNATION.

Where separate toilet rooms are provided for each sex are required by this code, each toilet room shall be clearly marked with regard to the sex which it is designated. Words such as MEN or WOMEN, in letters not less than one inch high, or appropriate symbols may be used to designate

the sex for which the toilet room is designed. Where a single toilet room is provided for use by either sex, the toilet room may be marked as UNISEX.

Note: The American Disabilities Act Accessibility Guidelines may require more restrictive standards on size and arrangement of toilet rooms as published in the Federal Register, 28 CRF, Part 36.

If, due to the occupant load of the building, sex-designated toilet rooms are required for males and females, all toilet rooms in the building must be sex designated for male, female, or UNISEX use. An exception is made to a private toilet room located directly off a private office, such as the corporation president's office and private bathroom.

COMM 52.53 LOCATION, LIGHT AND VENTILATION.

(1) Toilet rooms shall be ventilated in accordance with the provisions of s. COMM 64.65.

(2) Toilet rooms may not have ventilation openings in an elevator shaft or inner court that has windows of habitable rooms above unless the shaft or court has an area greater than 1,250 square feet and a least dimension greater than 20 feet.

COMM 52.55 ARTIFICIAL LIGHT.

Every toilet room, except those within living units, shall be artificially lighted during the entire period that the building is occupied, wherever and whenever adequate natural light is not available, so that all parts of the room, especially the toilet compartments, shall be provided with artificial light intensity of not less than 2.5 footcandles at the floor level.

COMM 52.56 SIZE.

Every toilet room shall have at least 14 square feet of floor area with a minimum width of 3 feet, and at least 100 cubic feet of air space for each water-closet and each urinal in addition to the space required for lavatories if installed within the toilet room.

This section sets for the minimum size of a toilet room with no consideration given to barrier-free access. If the toilet room is required as a barrier-free toilet room, the room must comply with the size requirements found in COMM 52.04.

COMM 52.57 FLOOR AND BASE.

Every toilet room, except those within living units of apartment buildings, shall have the entire floor and the side walls to a height of not less than 4 inches of a material impervious to water.

This code section requires that the floor of a toilet room be of a material which is impervious to water. This section does not limit itself to the floor finish material. Therefore, if a floor finish material is utilized which has cracks, such as square vinyl tiles, they must be installed on a subsurface which is impervious to water. Impervious, vinyl sheet flooring with welded seams will satisfy this requirement. If moisture can penetrate the floor finish material, something in the floor construction beneath the finish must provide for the impervious to water criteria.

Note: This section is also intended to prohibit the use of wall registers within 4 inches of the floor, baseboard registers and floor registers.

COMM 52.58 WALLS AND CEILINGS.

(1) The walls and ceilings of every toilet room shall be completely covered with smooth nonabsorbent material.

(2) The interior surface of walls and partitions shall be of light color to improve illumination and facilitate cleaning.

COMM 52.59 ENCLOSURE OF FIXTURES.

(1) PRIVACY. Water closets and urinals within a toilet room shall be arranged to ensure privacy. Water closets shall be enclosed with partitions, except as provided in ss. COMM 58.68 (1) and 60.15 (2)(a). Urinals shall be placed against walls at least 6 feet 8 inches high and arranged individually with or without partitions.

(a) *Exception.*

1. The above requirements need not apply to toilet rooms accommodating only a single closet or urinal or as specified in COMM 58.59(6)(b).

2. A privacy lock shall be provided for a toilet room with a single water closet and a nonregulated urinal when privacy partitions are not provided.

Where the term nonregulated is used, the intent was "non-required."

(2) PARTITION DESIGN. The partition enclosure shall provide privacy from an elevation of 12 inches above the floor to 5 1/2 feet above the floor.

(3) COMPARTMENT DESIGN. The water closet compartments in toilet rooms shall be not less than 30 inches in width, and shall be not less than 54 inches in depth with a clearance of not less than 24 inches between the fixture and the compartment door when closed except as specified in s. COMM 52.04 (8). Compartment doors which are hung to swing inward shall clear the fixture not less than 2 inches.

(4) PROHIBITIONS. No admission fee shall be charged for the use of any toilet room in a public building or place of employment. Key-locking of toilet rooms is prohibited in all buildings except service stations and filling stations having exterior toilet room access.

Note: Section 146.085, Stats., prohibits charging a fee for the use of toilet facilities and imposes a fine of $10 to $50 for violations.

COMM 52.60 FIXTURES.

(1) WATER CLOSETS.

(a) Except as permitted in par. (b), all water closets required to be provided in public buildings and places of employment shall:

1. Be of an elongated bowl type; and

2. Provided with either:

a. Hinged, open-front seats without covers; or

b. Hinged, closed-front seats, without covers, which are encased with a continuous plastic sleeve capable of providing a clean surface for every user and for which a specific material approval under s. COMM 50.19 has been issued.

WATER CLOSET CLEARANCES. Currently this code section does not address the location of a water closet that is not located in a toilet compartment. The Wisconsin Plumbing Code does address this issue and has the following requirement.

COMM 84.20 (4)(a) 7. A water closet shall not be located closer than 15 inches from its center to any side wall, partitions, vanity, or other obstruction, nor closer than 30 inches center to center, between toilets. There shall be at least 24 inches clearance in front of the water closet to any wall, fixture or door.

The Plumbing Code requirement must be met when locating water closets.

(b) Water closets which are required to be provided in day care centers or individual living units or sleeping units of residential occupancies within the scope of either ch. COMM 57 or 61 may be of a round-bowl type with a hinged, closed front seat with or without a cover.

Note 1: Under s. 145.25, Stats., and s. COMM 84.20 (3) all water closets may not use more than 4 gallons of water per flush.

Note 2: The plumbing code, s. COMM 84.20 (5) (m) 7., prescribes requirements for water closets relative to their location to partitions, side walls and other obstructions.

(2) URINALS.

(a) *Stall type.* Stall-type urinals shall be set into the floor, and the floor shall be graded toward the fixture. Spaces between stall-type urinals, or urinals and sidewalls, shall be filled in flush with the front and top of the urinal with nonabsorbent material if the space is less than 12 inches.

(b) *Wall type.* Wall-hung urinals may be installed in all buildings except child day care facilities and elementary schools kindergarten through 8th grade.

Note 1: The definitions and general classifications for schools are found in s. 115.01, Stats.

Note 2: The department recommends that wall-hung urinals be installed at a height between 22 inches to 24 inches above the floor.

Note 3: See s. COMM 52.04 (8) for additional requirements dealing with making wall-hung urinals accessible for people with disabilities.

(c) *Flushing devices.* The urinals shall be equipped with an effective flushing device which limits the use of water to not more than 1.5 gallons per urinal per flush.

(d) *Multiple urinals.* Batteries of urinals shall be spaced not less than 30 inches center-to-center. The center line of a single urinal shall be at least 16 inches from the nearest sidewall or partition.

(e) *Materials.* Only individual urinals of porcelain, vitreous china, stainless steel, or other nonabsorbent materials approved by the department shall be used.

(3) HAND-WASHING AND DRYING FACILITIES. Hand-washing facilities shall be provided in all places of employment and public buildings as specified in the occupancy chapters of COMM 54 to 62.

(a) *Lavatories.* Except as provided in sub. (6), lavatories shall be of an approved type and shall be provided with hot and cold running water. The faucets of such lavatories shall be of a type which limits the flow of water through the faucet, after the handle is released, to not more than one gallon. Lavatories in toilet rooms of private living units shall be equipped to limit the flow of water to not more than 3 gallons per minute. The lavatories may be equipped with a hot and cold regulating device. If a multiple-use lavatory is installed, 24 lineal inches of wash sink or 20 inches measured along the edge of a circular basin will be considered equivalent to one lavatory. At least one lavatory shall be provided either in each toilet room or in a sex-designated lounge adjacent to the toilet room.

(b) *Hand-drying facilities.* Individual hand towels, sections of cloth or paper, or clean individual sections of continuous toweling, convenient to the lavatories, shall be provided. Hand-drying facilities shall be provided at the ratio of at least one unit for every 3 lavatories. Warm-air blowers may be substituted for up to one-half of the required hand-drying units. Warm-air blowers shall provide air at not less than 90° F, nor more than 140° F.

Please note that warm air dryers may be used only to supplement paper or cloth towels. Warm air dryers are not permitted as the only hand-drying means.

Note: The department will accept the qualified blowers listed by Underwriters' Laboratories, Inc.

(c) *Toilet soap.* Soap or similar cleansing agents shall be provided.

(d) *Receptacles.* Receptacles shall be provided for the disposal of used towels and other waste materials.

(4) DRINKING FACILITIES. Drinking facilities shall be provided in all buildings except in areas where food and drinks are served. Drinking facilities shall not be installed in toilet rooms, except in residential occupancies. Drinking fountains, coolers or individual cups at a potable water source may be provided. Common drinking cups are prohibited.

Note: Where running water is not available, a covered drinking water container, equipped with a faucet or bubbler, may be provided. The container should be cleaned and sanitized at frequent intervals.

The intent of this section is not to prohibit bottled water dispensers. Even though running water may be available to the building, a bottled water dispenser or cooler may be used as the only source of drinking water. Owners are advised however that they have the responsibility to ensure that an adequate supply of bottled water is maintained in the building during all periods of occupancy.

(5) BATHING FACILITIES. Bathing facilities shall be provided for the specific occupancies outlined in the occupancy chapters of this code.

(a) All shower compartments, regardless of shape, shall have at a minimum finished interior of 900 square inches and shall be capable of encompassing a 30-inch circle. The minimum required area and dimension shall be measured at a height 24 inches above the top of the threshold and at a point tangent to its centerline. The minimum area and dimensions shall be maintained to a point 70 inches above the shower waste outlet with no protrusions other than the fixture valve or valves, showerheads, soap dishes and safety grab bars or rails. Each shower room or compartment shall be constructed of material impervious to moisture. The floor of the shower room or compartment shall be provided with a slip-resistant finish.

(b) *Hot and cold water.* Except as provided in sub. (6), bathing facilities shall be provided with hot and cold water and be equipped with a hot and cold water regulating device. The device shall be plainly marked. Supply or feed pipes to showers shall be placed overhead or protected to avoid the probability of a person coming in contact with the hot water pipes. Showers shall be equipped to limit the flow of water to not more than 3 gallons per minute per shower head.

(c) *Toilet soap and towels.* Employes who use showers shall be provided with soap or other appropriate cleansing agents and clean individual towels.

Note: See ch. COMM 82 for special fixture requirements.

(6) LAVATORIES, USE OF HOT OR TEMPERED WATER.

(a) Lavatories, wash fountains and shower heads which are not located in dwelling units or living units shall be supplied with either tempered water or hot water.

1. Tempered water shall be provided to lavatories, wash fountains and shower heads by means of tempering mixing valves.

(b) Lavatories located in park shelters and bath houses which are not open during the period from November 15 to March 15 and which are not places of employment shall not be required to be provided with hot water.

(c) Lavatories located in waysides which are not places of employment shall not be required to be provided with hot water.

Note: The exception of providing hot water under pars. (a) to (c) does not supersede the requirements of other state agencies for providing hot water.

COMM 52.61 PROTECTION FROM FREEZING.

All water closets and urinals and the pipes connecting therewith shall be properly protected against freezing, so that such water closets and urinals will be in proper condition for use at all times.

COMM 52.62 DISPOSAL OF SEWAGE.

(1) Each water closet and urinal, and each lavatory or slop sink, located in a toilet room shall be connected with a sewer and water system, where such systems are available. In locations where a sewer system is not available, or cannot be made available, the disposal of human waste may be accomplished as follows:

(a) Sewage treatment tank and disposal system; or

Note: For detailed requirements on such systems see ch. COMM 82.

(b) Where the local conditions make it impractical to install such system, outdoor toilets, as described in s. COMM 52.63, or other facilities, such as septic toilets installed in accordance with the provisions of the state plumbing code, chs. COMM 81 to 87, may be used; provided that in the case of places of employment for more than 10 persons, schools larger than 2 rooms, and apartment houses, water flush toilets as herein described shall be provided, unless outdoor toilets or other facilities are permitted in writing by the department.

For all practical purposes, this section of the code prohibits privies or pit toilets. Except as allowed in 52.63 (2), all toilet facilities must be provided with running water and a waste disposal system where running water and a waste disposal system are available or where running water and a waste disposal system can be provided. In most areas of the state, running water can be made available by drilling a well and, even though municipal waste disposal is not available, a private, on site waste disposal system can be provided subject to the rules administered by our water and waste systems bureau and local ordinances. A privy or pit toilet will only be permitted where municipal or private, on site waste disposal is not available or prohibited. County or municipal sanitarians should be contacted regarding the installation of private, on site waste disposal systems and privies.

The department will accept portable toilets for temporary facilities at short-term events such as festivals and fairs. Portable toilets are not permitted as a substitute for permanent fixtures in locations subject to long term occupancy. Local officials should be contacted with respect to their requirements regarding location and servicing of portable toilets.

COMM 52.63 PERMANENT AND TEMPORARY OUTDOOR TOILETS.

(1) PERMANENT OUTDOOR TOILETS. Permanent outdoor toilets shall comply with ss. COMM 52.50 to 52.59, inclusive, and in addition:

(a) No privy, with or without a seepage pit or other container as specified for use by the department, shall be erected or maintained within 50 feet of any well, 10 feet of the line of

any street or other public thoroughfare, 5 feet of the property line between premises or 25 feet of a door, window or other outdoor openings of any building;

(b) A permanent outdoor toilet shall be located on a site where the soil is well-drained, and where there is no possibility of contaminating any drinking water supply, groundwater or surface water;

Note: Refer to ch. COMM 83 for soil and site criteria for location of outdoor toilets.

(c) A permanent outdoor toilet shall be provided with a suitable approach, such as a concrete, gravel or cinder walk;

(d) For permanent outdoor toilets, the foundations shall be of concrete or other masonry;

(e) The vault of a permanent outdoor toilet shall extend at least 6 inches aboveground, be impervious to light, and be proof against entrance by flies, rats, or other vermin. The upper portion shall be of concrete, or of brick or stone laid in cement mortar. If located on a site with poorly-drained soil, the entire vault shall be of concrete, brick, or stone, or laid in cement mortar;

(f) All windows, ventilators and other openings shall be screened to prevent the entrance of flies, and all doors shall be self-closing. A separate ventilator shall be provided for the vault and shall extend from the vault to not less than one foot above the roof and be provided with an effective ventilating hood; and

(g) The entire installation shall be kept clean and sanitary. Milk of lime (freshly slaked lime) or other equally effective disinfectant shall be used in the vault and in the urinal trough in sufficient quantities, and at frequent intervals. The floors, seats and urinals shall be scrubbed as often as necessary. The vault shall be celaned out at proper intervals.

(2) TEMPORARY OUTDOOR TOILETS. Temporary outdoor toilets shall comply with ss. COMM 52.50 to 52.59, inclusive, and in addition:

(a) No temporary toilet may be erected or maintained within 50 feet of any well, 10 feet of the line of any street or other public thoroughfare, unless vehicular traffic has been temporarily detoured while toilets are in use, 5 feet of the property line between premises or 25 feet of a door, window or other outdoor openings of any building;

(b) A temporary outdoor toilet shall be stabilized and located on a site where the soil is well-drained, and where there is no possibility of contaminating any drinking water supply, groundwater or surface water;

(c) A temporary outdoor toilet shall be located with an approach such that access is unobstructed, and free of brush, debris and standing water;

(d) A temporary outdoor toilet shall be serviced by a licensed septage disposer and the contents disposed of properly as required by ch. NR 113.

(e) For specialty events centers without permanent sanitary fixtures in number as required by Tables 54.12-A or 54.12-B, temporary outdoor toilets shall be used to meet the number required for the event, using capacity or seating capacity.

COMM 52.64 MAINTENANCE AND HOUSEKEEPING.

(1) MAINTENANCE OF TOILETS. Every toilet room, and every part thereof, including walls, floor, ceiling and fixture therein, shall be kept clean, efficient, and in good repair.

(2) PAPER. In every toilet room, sufficient toilet paper made of material which will not interfere with the operation of the system or obstruct the fixtures, shall be provided.

(3) **DEFACEMENT.** Indecent or suggestive marks, pictures, or words are forbidden in toilet rooms, and such defacement when found shall be removed at once.

(4) **SERVICE CLOSETS.** In buildings having 5 or more fixtures (water closets and/or urinals), a service closet shall be provided conforming with the requirements for toilet rooms.

(a) The service closet shall be supplied with mop, broom, bucket, soap, toilet paper, toweling and other equipment for sanitary upkeep of toilet rooms.

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Chapter COMM 53

STRUCTURAL REQUIREMENTS

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COMM 53.01 SCOPE.

This chapter provides the minimum requirements for the structural design of all buildings, structures and foundations to provide safe support of all dead loads, superimposed live and special loads, without exceeding the prescribed allowable stresses or departing from accepted engineering practice.

Scope. *This chapter provides minimum requirements for the safe support of designated and special loads using conventional structural materials. The information necessary to determine if the design meets requirements of the code is specified in s. COMM 50.12 (4)(a) and includes: itemized design loads, material properties, soil-bearing values, wind bracing and lateral stability requirements, connection details and typical calculations (complete calculations if requested). The use of materials not mentioned in this chapter requires approval in accordance with s. COMM 50.19.*

Note: References. All standards referred to in this chapter will be identified by the acronym designation and the number of the standard.

Subchapter I — Minimum Allowable Loads

COMM 53.10 DEAD LOADS.

All buildings and structures, and parts thereof, shall be designed and constructed to support the actual dead weight of all component members in addition to the weight of partitions, ceiling finishes, floor finishes, stairways, safes and service equipment such as sprinkler systems, plumbing stacks, heating and air conditioning equipment, electrical equipment, elevators, flues and similar fixed equipment which become a part of the building.

Dead load. *Dead load is the actual weight of all construction materials-structural components, walls and partitions, finish materials, equipment and services which are a permanent part of the building. The 3 psf minimum service equipment load is intended for miscellaneous piping, ductwork, fans and other light equipment which may not be known at the time the building is designed. The 3 psf load may not be adequate for design of members directly supporting major HVAC or other fixed service equipment. These loads should be given special consideration by the designer.*

Note: Unless the project owner submits a written application for waiver, the department will consider 3 pounds per square foot as minimum service equipment load.

COMM 53.11 LIVE LOADS.

(1) All buildings and structures, and parts thereof, shall be designed and constructed to support the superimposed live loads, specified in Table 53-I, uniformly distributed in pounds per square foot of horizontal area. These load requirements shall be considered only as a minimum. In every case where the loading is greater than this minimum, the design of the building or structure, or part thereof, shall be for the actual load and loading conditions. The most severe distribution, concentration and combination of design loads and forces shall be taken into consideration.

Live loads. *Live loads assumed for design should be the maximum probable loads that will be produced by the intended use of occupancy, but not less than the loads specified in Table 53-1. Designers and owners should consider factors that result in differences between actual and calculated loads.*

TABLE 53-I
FLOOR LOADINGS

Occupancy	PSF
(a) Business	
1. Offices	50
2. Offices with heavy business machines, heavy files, book stacks	100
(b) Mercantile	
1. Retail stores, shops, banks, restaurants, taverns, funeral homes	100
2. Wholesale stores	125
(c) Industrial	
1. Manufacturing, light	100
2. Manufacturing, heavy	150
(d) Storage	
1. Warehouse, light	125
2. Warehouse, heavy	250
3. Paper storage	
a. Compact	50 psf per ft. of ht.
b. Loose	30 psf per ft. of ht.
4. Garages/storage or repair or 8,000 pound axle load in any possible position (whichever produces larger stresses).	80
5. Parking decks	
a. All areas for passenger cars	50
b. Top floors, if open to sky, shall be designed for 50% of the roof load specified in sub. (4) in addition to	50
c. Express lanes and ramps with a slope of 12% or more, the vertical loading (50 psf) shall be increased by 25%	
d. All areas for trucks and buses or 8,000 pound axle load in any possible position (whichever produces larger stresses)	80
(e) Assembly areas	
1. Armories, drill rooms	150
2. Assembly halls, auditoriums, lecture halls, churches, lodge rooms, theaters, courtrooms, balconies, with:	
a. Fixed seats	60
b. Movable seats	100
3. Dance floors gymnasiums, exhibition rooms, passenger stations, skating rinks, restaurant serving and dining areas	100

TABLE 53-I
FLOOR LOADINGS

Occupancy		PSF
	4. Recreational areas such as bowling alleys and pool rooms	75
	5. Floors supporting portable reviewing stands and assembly seating facilities with vertical dead load less than 15 pounds per square foot	100
	6. Stage floors	150
	7. Floors supporting portable reviewing stands and assembly seating facilities with vertical dead load of 15 pounds per square foot or more plus the actual vertical dead load of reviewing stand or assembly seating facility	100
(f)	Educational	
	1. Schools and related facilities	
	a. Classrooms, study rooms, laboratories, display areas, offices	50
	b. Floors of open plan schools	75
	c. Industrial arts, home economics, music and band rooms	80
	d. Gymnasiums, cafeteria areas	100
	2. Libraries (public or in schools)	
	a. Reading areas	60
	b. Stack areas (20 psf per foot of height) but not less than	150
	3. Museums and art galleries	80
(g)	Residential	
	1. Apartments, dormitories, guest rooms in hotels and motels	40
	2. Storage in apartment buildings	80
	3. Attic storage within living units	20
(h)	Institutional	
	1. Ward and private rooms in hospitals, nursing homes, asylums, cells in penal institutions	40
	2. Operating rooms in hospitals, clinics	60
(i)	Miscellaneous (applies to all occupancies above)	
	1. Stairways, corridors, vestibules, lobbies	
	a. in residential and institutional buildings	80
	b. in all other buildings	100
	2. Rest rooms and toilet rooms in public places	50
	3. Equipment rooms (heating-ventilating, mechanical, electrical) equipment weight plus 40 psf, but not less than	75
	4. Structural sidewalks and promenade decks	
	a. with no vehicular restriction or 12,000 pounds concentrated load in any position	250
	b. with vehicular restriction	100
	5. Walkways and elevated platforms, other than exitways, and their supports serving as access to equipment rooms and other normally unoccupied areas	60
	6. Accessible, nonstorage attics and catwalks	25

Question: *Table 53-I sets forth floor loading requirements for various uses of the floor. Although small CBRF (9 to 20) and small rooming houses allow 40#/sf for the rooms, must the corridors to the rooms be designed for 80#/sf and the living room and dining room be designed for 100#/sf*

Analysis: *The floor loadings are based on the need for structural capability based on the number of people likely to be occupying the floor at any one time. Larger facilities may have a significant number of people in the corridors under emergency exiting situations and the living and dining rooms may be occupied in a manner similar to a commercial restaurant. This would justify the increased structural capacity called for by the table for corridors and dining rooms. Small CBRF and rooming houses operate similar to a single apartment or living unit and have relatively few people with which to load the floor. It is reasonable to require only the 40#/sf loading in the public corridors, living rooms, and dining rooms in such an occupancy, as that is all that is required within a living unit of a true apartment.*

Answer: *New and existing building conversions to a CBRF, with a licensed capacity of 20 or less and in rooming houses with 10 or fewer rooms, require only 40#/sf loading throughout the building, including the corridors and common use rooms. Use judgment for storage rooms, requiring 125#/sf only for rooms exceeding a typical apartment size closet or store room. In other words, basically treat the entire building as a living unit for floor loading purposes.*

Question: *What live load should be used for nonrequired decks?*

Answer: *Decks not required for exiting purposes need to meet an 80 psf live load or greater if the deck is used for assembly, storage or other use with a higher live load requirement specified in Table 53-I.*

(2) LOADS NOT SPECIFIED IN TABLE 53-I. See s. COMM 53.11 (1).

Occupancies not listed. *For occupancies not listed, the live load should be determined in a manner acceptable to the department. Additional information on live loads can be found in ANSI/ANSI A7.*

(3) LIVE LOAD REDUCTIONS.

(a) No reduction of live load shall be allowed in the design of any slab or joist.

(b) No reduction of live load shall be allowed in the occupancies mentioned in Table 53-I pars. (d) storage and (e) assembly areas.

(c) For determining the total live load carried by foundations, columns, piers, and walls, the following reductions can be applied to the entire floor area tributary to these members:

carrying the roof..... 0%	carrying 5 floors and roof..... 30%
carrying 1 floor and roof..... 0%	carrying 6 floors and roof..... 35%
carrying 2 floors and roof 10%	carrying 7 floors and roof..... 40%
carrying 3 floor and roof..... 20%	carrying 8 floors and roof..... 45%
carrying 4 floors and roof 25%	carrying 9 or more floors and roof..... 50%

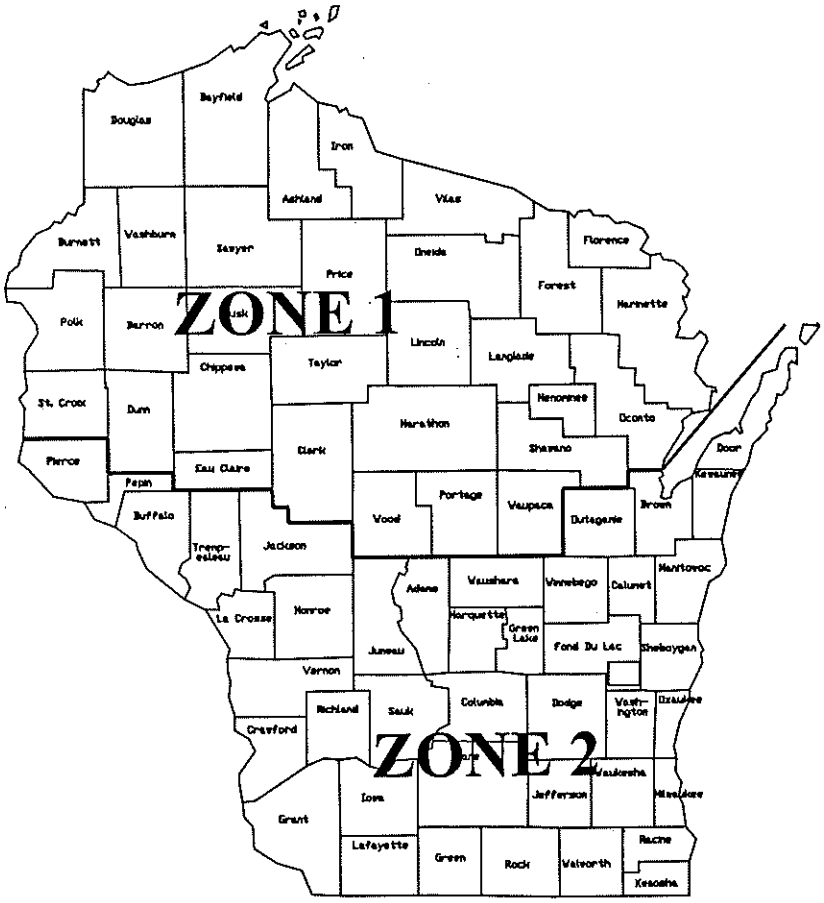
The total loads developed in the design of a column or bearing wall that were based on the load reductions permitted by (c), may be used as the design (point or linear) load on a slab or joist supporting the column or bearing wall, without being in conflict with (a).

(d) Except for roofs, a reduction in live load of one percent per 20 square feet is allowed for beams and girders which have a tributary area in excess of 150 square feet. The maximum reduction should not exceed 15% and such reduction shall not be carried into the structural members supporting these beams and girders.

(4) ROOF LOADS. Roof structural members subject to snow accumulation shall be designed for all of the following roof load distributions.

ZONE MAP FOR ROOF LOADS

ROOF LIVE LOADS
Zone 1 40 PSF
Zone 2 30 PSF



Roof loads. *Roof loads indicated in the zone map are the minimum design live loads. Roofs subject to drifting or sliding snow or water accumulation require special consideration as described in (b) through (d). All non-uniform design load conditions are the responsibility of the building designer and must be specified on building plans when a structure component is to be designed by others. See COMM 50.12 (4)(a) 1.*

Question: *When an existing roof system is re-roofed, thereby adding additional dead load, must there be beefing up of the structure, taking into account a change in the live load and drift load requirements, from the code in effect at the time the building was constructed? What is repair versus what is alteration?*

Answer: *1. If structural analysis shows the additional dead load will cause the original design live load plus dead load code requirements to be exceeded, the designer must either remove part of the*

roofing so that the original design load is not exceeded or beef up the structure to satisfy the current code requirements.

2. If the re-roofing changes the shape of the roof (other than increasing the shape by adding flat members supported for the entire length), the re-roofing will be considered an alteration required to meet the current code.

3. If the reroofing is considered an alteration, the alteration is then required to comply with the present live load and drift load requirements.

4. If the reroofing is considered a repair of the existing roof system, the code in effect at the time that the roof was constructed would be the governing code.

Note: For the purpose of this evaluation, adding insulation to an existing roof is not considered as increasing the snow load due to preventing melting of snow on the roof.

(a) 1. Except as provided in subd. 2., full load as indicated in the zone map for roof loads distributed over the entire area. The loads shall be applied to the horizontal projection of the roof.

2. a. Roofs, except of greenhouses, with an unobstructed slippery surface such as glass, plastic, metal, slate or similar material that will allow snow to slide off the eaves and having a slope (a) exceeding 30°, may be designed for a load determined by multiplying the roof load specified in subd. 1., by a slope factor (CR) using the following formula:

$$C_R = 1.0 - \left(\frac{a - 30^\circ}{40^\circ} \right)$$

b. Roofs of greenhouses and other similar glazed structures shall be designed in accordance with this section or s. COMM 62.96.

A reduction of the design load is permitted for roofs having a slippery surface and slope exceeding 30°. Composition roofing and wood shingles do not qualify for the reduction. Design loads for greenhouses are specified in COMM 62.96 (3).

(b) Unbalanced or partial loading for the following conditions:

1. Full load on the leeward side and one-half load on the windward side of sloped roofs having a pitch of 15° or more;

2. Full load on the end span of continuous purlin members having a tributary area of 200 square feet or less and one-half on the remaining spans; and

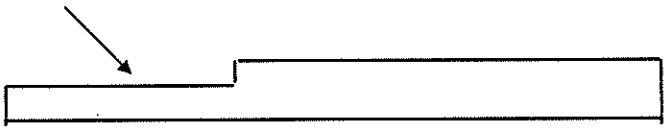
3. a. Except as provided in subpar. b., full load on any one portion of the roof area and one-half on the remaining portion of the roof area, in a manner to produce the greatest effects on cantilever members and the anchor spans.

b. Cantilever roof framing design shall include anchorage and supports capable of providing stability for full load applied on the cantilever without relying upon possible live load on the anchor span.

Canopies and other roofs having cantilevered framing require special consideration for distribution of the design live load.

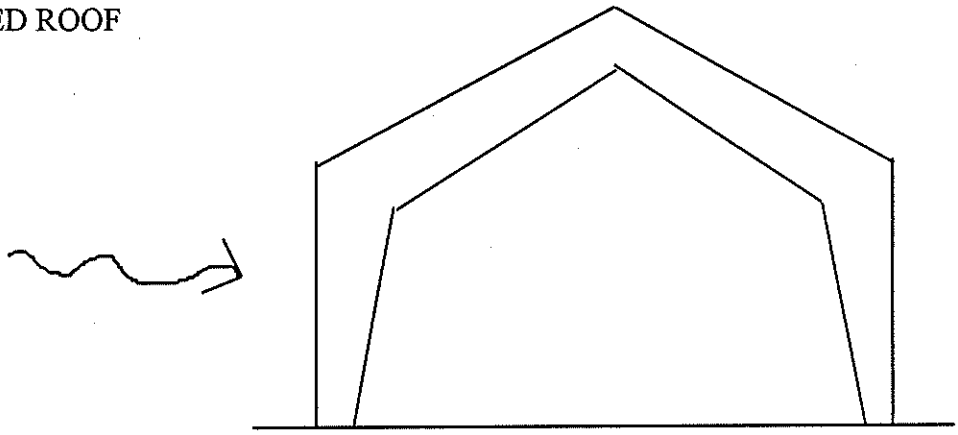
53.11 (4)(b) UNBALANCED/PARTIAL ROOF LOAD

1/2 Load



1. SLOPED ROOF

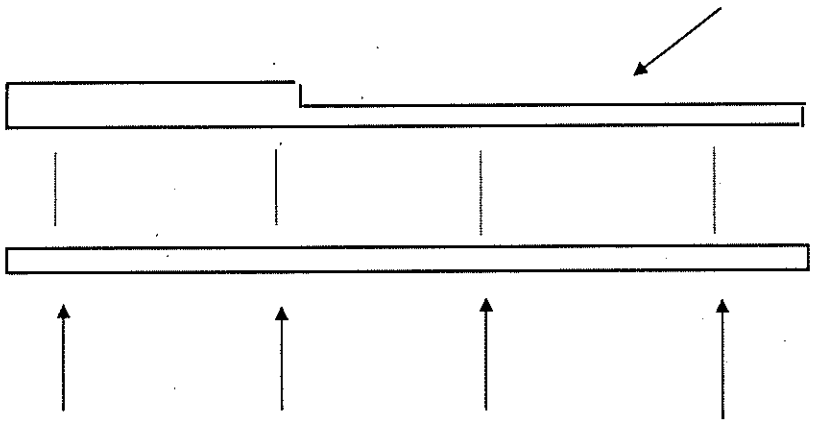
wind



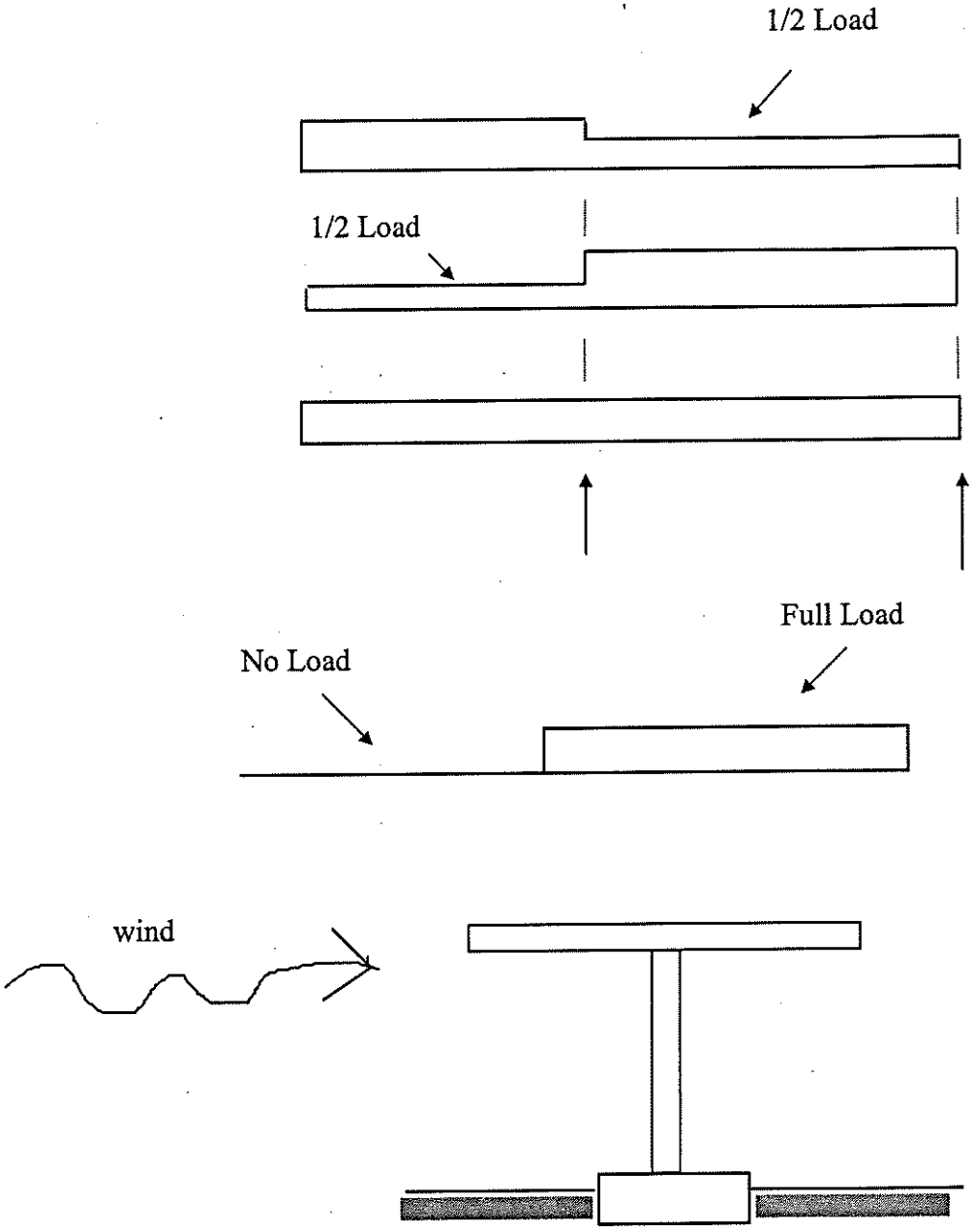
Applies to framed structures with slope greater than $15° \frac{(3\ 1/2)}{12}$

2. CONTINUOUS PURLINS

1/2 Load



3. CANTILEVER MEMBERS



(c) Nonuniform load caused by excess snow, ice or water accumulation at roof level elevation differences, parapets, canopies, valleys and similar areas.

1. The nonuniform snow loading shall be determined by multiplying the indicated roof load by a snow load coefficient (Cs) appropriate for the roof area considered.

$S = C_{sg}$

where S = design snow load, psf

g = roof live load as indicated in the zone map for roof loads see [par. (a)]

C_s = snow load coefficient

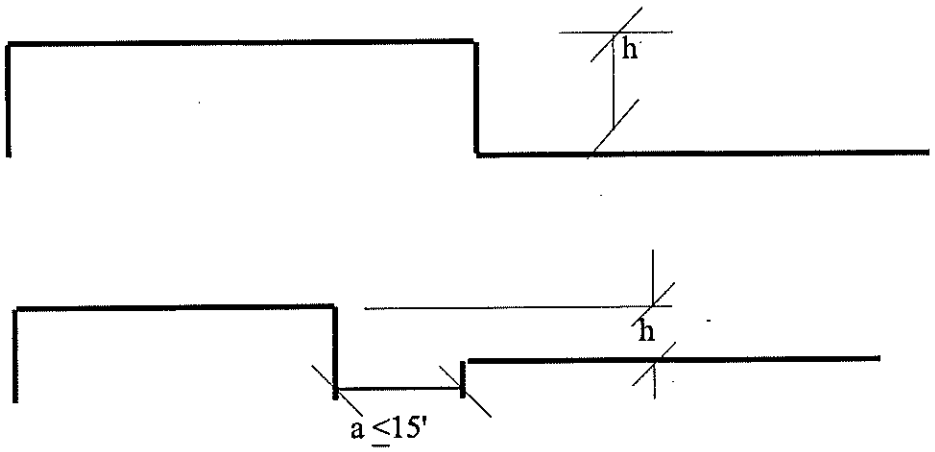
2. The roof load shall be increased to account for the accumulation of drifting snow on the lower of multilevel roofs if the upper roof is part of the same building or of an adjacent building not more than 15 feet away.

The provisions for drift loads and other considerations in this section are applicable to new buildings and also to existing buildings where a higher roof or wall is constructed adjacent to an existing building on the same property. The necessary structural alterations, shoring or other provisions for supporting increased roof loadings are required to meet the current code. The rule is not considered to apply to existing buildings on adjoining properties; however, the department strongly recommends the provisions be made. The designer should advise the owner of an adjoining building regarding the probability of a roof being subject to drift load.

The 1986 edition of the "Metal Building Systems Manual" of the Metal Building Manufacturers Association (MBMA) contains a design provision for drift loads on lower roofs that may result in lower design loads than the loads generated using the following design provisions. These lower design loads are not acceptable.

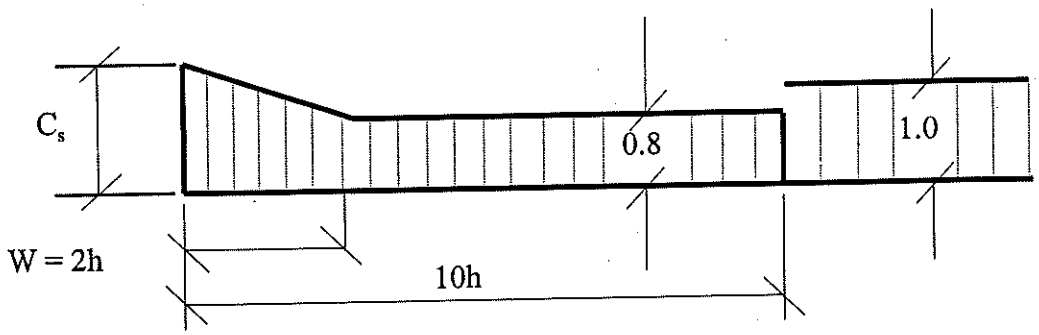
***53.11 (4)** The following design provisions may be used to determine the non-uniform snow loads as required by this section.*

ROOF SHAPES



Lower level of multi-level roofs (when upper roof is part of the same building or on an adjacent building not more than 15 feet away.

SNOW LOAD DISTRIBUTIONS AND COEFFICIENTS, LIMITATIONS



C_S = 15h/g = Snowload Coefficient

when 15h/g < 1.0 use C_S = 1.0

*when 15h/g > 3.0 use C_S = 3.0**

W = 2h

when h < 5 ft use W = 10

h > 15 ft use W = 30

h = difference of roof heights in ft.

g = roof live load in psf [COMM 53.11 (4)]

W = width of drift from higher building in ft.

Design upper roof for loads applicable to single-level roofs.

**An upper limit of 3 times the basic roof load has been suggested. It should be noted, however, that higher loads have been observed where an upper roof was very long (measured perpendicularly to the step between the upper and lower roofs). On the other hand, for relatively short upper roofs (say less than 50 ft.), a reduction below the calculated C_S value may be judged adequate by the designer.*

***Question:** What are the guidelines used to clarify snow drifting in valley areas of trusses or roof framing?*

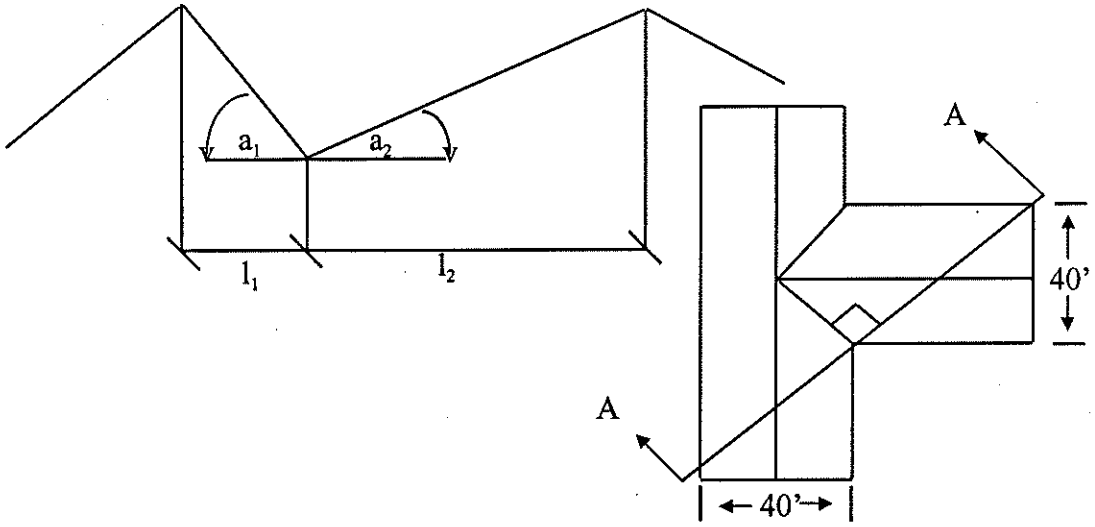
***Answer:** The following diagrams indicate criteria for valley areas of two-span and multi-span sloped or curved roofs. The design shall be for the most critical of three cases dependent on the angle of the roof with horizon.*

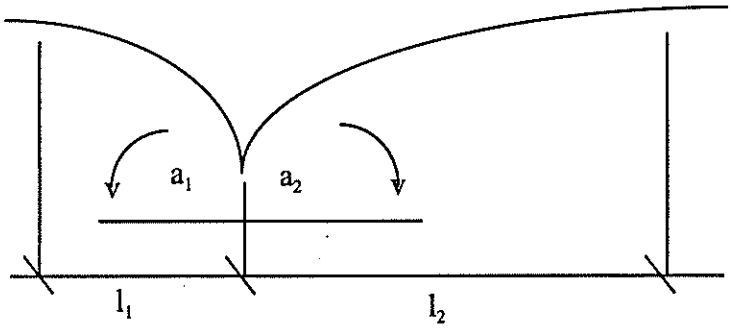
The requirements utilized for roof framing to horizon greater than 10 degrees equates to a 3:12 pitch. The requirements are not dependent on the steepness of the valley as the snow load coefficient is set at either 1.0 or 1.5. The requirements also base the span of the higher loading on the peak-to-peak distance. Also do not set an end point for the .5 coefficient adjacent to the higher loading.

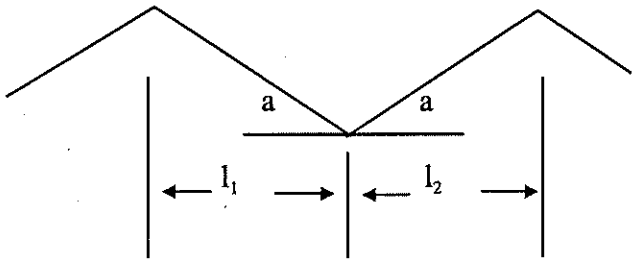
The following diagram indicates a cross section through an intersecting ridge line roof system with the snow load distributions and coefficients equivalent to what is in the Code Appendix, but with a recommendation that both angles theta 1 and theta 2 less than or equal to 15 degrees use case 1 only, otherwise use case 1, 2 and 3, whichever is the most restrictive.

ROOF SHAPES

Valley areas of two-span and multi-span sloped or curved roofs







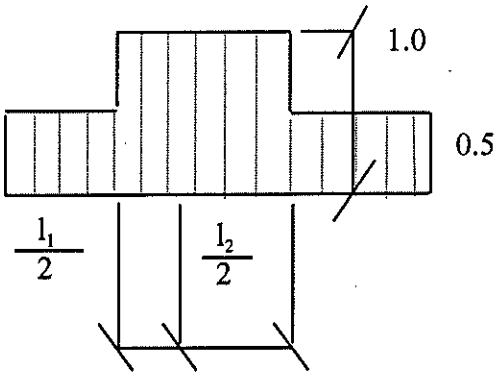
SNOW LOAD DISTRIBUTIONS AND COEFFICIENTS, LIMITATIONS

CASE I

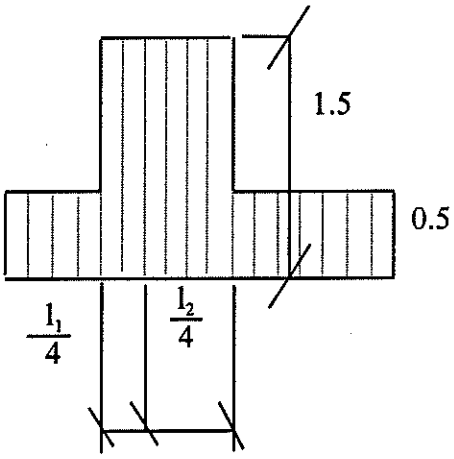


$C_s = 1.0$

CASE II

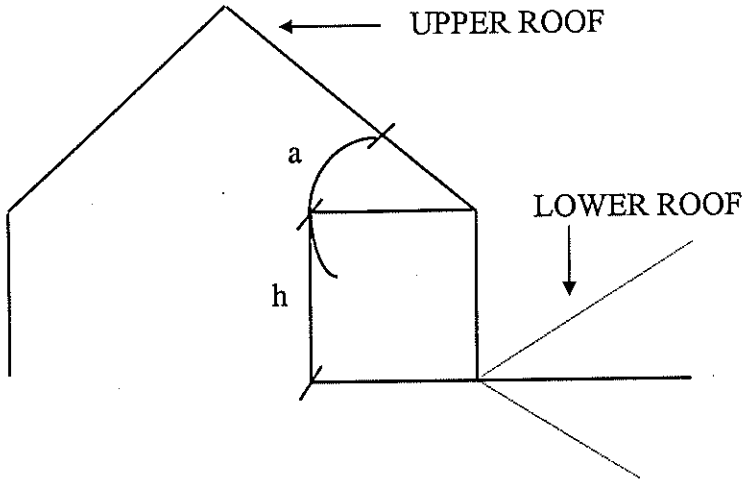


CASE III



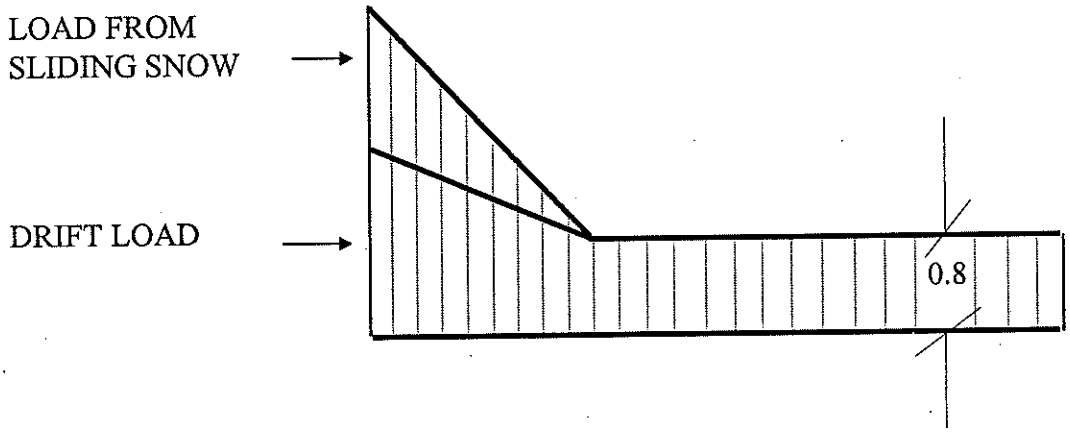
For both a_1 and $a_2 \leq 10^o$ use Case I only; otherwise Case I, II and III

ROOF SHAPES



Lower of multi-level roofs with upper roof sloped towards lower roof, where a exceeds 10^o.

SNOW LOAD DISTRIBUTIONS AND COEFFICIENTS, LIMITATIONS

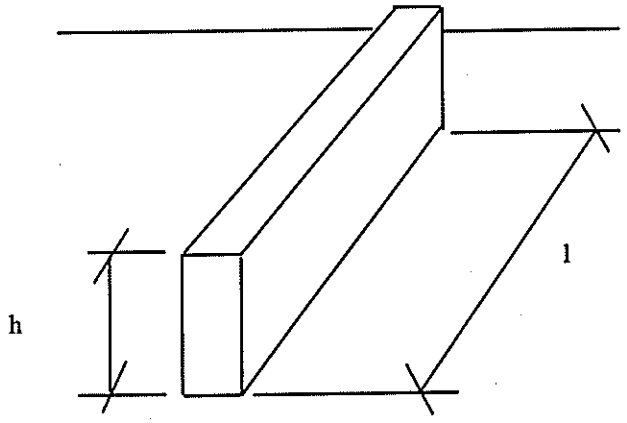


***Design lower roof** for loads applicable to multi-level roof plus a portion of the sliding snow from the upper roof.**

***Design upper roof** for loads applicable to single-level roofs.*

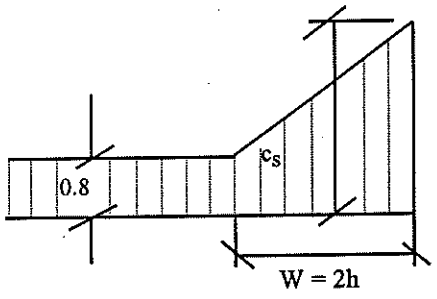
**Where snow is likely to slide onto a lower roof from an upper roof, the lower roof should be designed for the load as provided for multi-level roofs plus an additional load produced by the snow that may slide from the upper roof. It is not possible to provide coefficients for this situation, but the following guide is recommended. Because of the remote probability that both upper and lower roofs will have their full load over the full areas simultaneously when sliding occurs, it may be assumed that the lower roof would be carrying its full load and that sliding of 50% of the total weight of the applicable uniformly distributed snow from the upper roof would occur.*

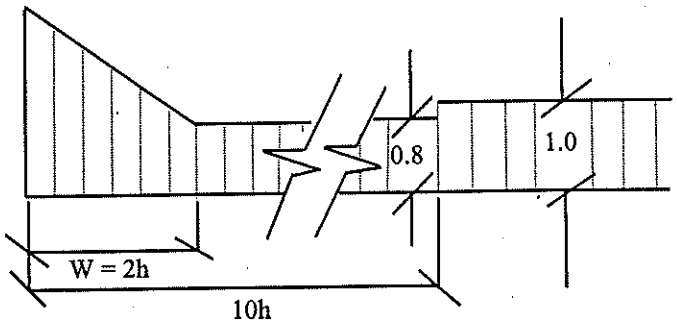
ROOF SHAPES



Roof areas adjacent to projections and obstructions on

SNOW LOAD DISTRIBUTIONS AND COEFFICIENTS, LIMITATIONS





$C_S = 10h/g$

when $10h/g < 1.0$ *use* $C_S = 1.0$

when $10h/g > 2.0$ *use* $C_S = 2.0$

when $l < g/6$, *use* $C_S = 1.0$

W = 2h

when h < 5 feet, use W = 10

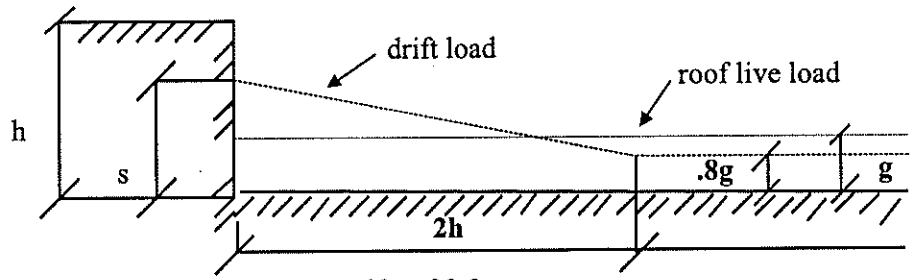
when h > 15 feet, use W = 30

h = *height of projection in feet*

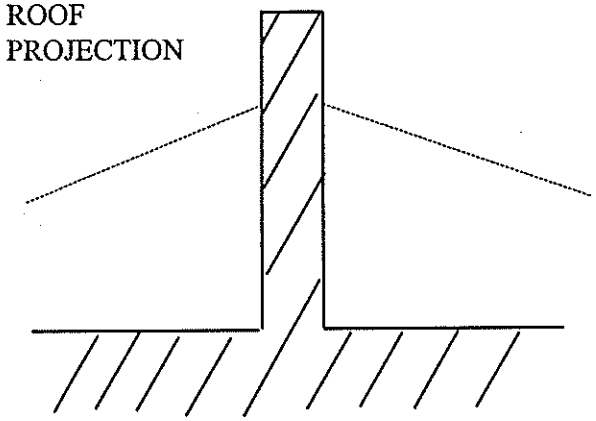
g = *roof live load in psf*

W = *width of snow drift in feet*

l = *length of projection in feet.*



10 to 30 feet

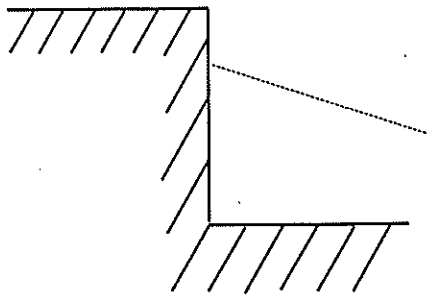


$C_s = \frac{10h}{g}$

(max. 2.0)

h	Drift Load, $S=C_S$ g	
	Zone 1	Zone 2
≤3	40	30
4	40	40
5	50	50
6	60	60
7	70	60
≥8	80	60

MULTI-LEVEL ROOF



$Cs = \frac{15h}{g}$ (max. 3.0)

h	Drift Load, $S=C_S$ g Zone 1	Zone 2
≤2	40	30
3	45	45
4	60	60
5	75	75
6	90	90
7	105	90
≥8	120	90

COMM 53.11 (4)(d)

Snow Load Accumulation

(d) 1. Roof designs incorporating storm drain sizes less than those specified in s. COMM 82.36 (4) and (5), shall be investigated by calculation to determine if stability of the building or structure due to ponding is achieved.

2. When roof drains are needed to remove precipitation and are the sole means of water escape, there shall be placed in all parapet walls, scuppers or relief openings to prevent overloading of the roof.

Special attention to design of the roof structure is necessary where the roof drainage system incorporates devices or methods for delaying the flow or controlling the capacity of storm drain systems. See Plumbing Code s. COMM 82.36 for information and approval required for such systems. Tables for determining minimum drainpipe sizes for adequate drainage are provided in the Appendix of the Building Code for reference.

As the building designer can choose the roof shape and slope direction during the design process, ***scuppers are REQUIRED to be installed in parapet walls*** *which will cause ponding of water on the roof to occur. In most cases, openings are permitted in these parapet walls and scuppers may be installed without any problem. When scuppers are not possible due to fire-rated parapets, a secondary roof drain system may be permitted. The secondary roof drain system must meet the following:*

1. Be independent of the primary roof drain piping system.

2. Have an inlet height of not less than 4 inches above the other roof drain, but not more than 5.75 inches for 30 PSF snow load or 7.7 inches for 40 PSF snow load regions (unless the roof is clearly shown as designed for ponding of a greater depth).

3. Be protected from freezing (piped through the building interior).

4. Provided with inlet and outlet protection from clogging and freezing.

5. Be discharged to daylight at least 12 inches above grade to a splashblock or similar device.

6. Meet all other state codes and local ordinances as required.

Other such codes as COMM 82.36 plumbing rules, Dept. of Commerce rules on erosion control, DNR stormwater control rules, and local (city) ordinances requiring storm sewer connections should be investigated by the building designer before this alternative is chosen.

A-53.11 (4)(d) ROOF DESIGNED FOR CONTROL FLOW DRAINAGE. This section refers to the requirements of the Plumbing Code (ch. COMM 82) for storm drain sizes where control flow drainage roof design is used. The following information from the Plumbing Code is provided for use by the building designer.

Partial Reprint of s. COMM 82.36 (4) and (5):

(4) LOAD ON DRAIN PIPING. (a) Storm water drainage. The load factor on storm water drain piping shall be computed in terms of gallons per minute or on the square footage of the horizontal projection of roofs, paved areas, yards and other tributary areas.

(b) Continuous flow devices. Where there is a continuous or semi-continuous discharge into the storm building drain or storm building sewer, as from a pump, air conditioning unit, or similar device, each gallon per minute of such discharge shall be computed as being equivalent to 26 square feet of roof area.

***(5) SELECTING SIZE OF STORM AND CLEAR WATER DRAIN PIPING.** (a) Horizontal storm water drain piping. The pipe size for horizontal drain piping for storm water shall be determined from Tables 82.36-1 to 82.36-4.*

Table 82.36-1
MINIMUM SIZE OF STORM WATER HORIZONTAL DRAIN PIPING SERVING ROOF AREAS

Pipe Diameters (in inches)	Maximum Roof Areas (in square feet) Pitch of Piping Per Foot			
	1/16 inch	1/8 inch	1/4 inch	1/2 inch
3	650	910	1,300	1,820
4	1,300	1,950	2,990	3,770
5	2,470	3,640	5,070	7,020
6	4,160	5,980	8,320	11,700
8	9,320	13,000	18,200	26,000
10	17,680	24,700	33,800	50,440
12	27,300	41,080	57,200	81,900
15	52,000	72,800	105,300	146,640
18	85,500	121,550	174,200	247,000
21	156,520	179,660	256,880	374,400
24	187,200	261,560	382,200	546,000

Note: Divide square footage by 26 to obtain flow in gpm.

Table 82.36-4
MAXIMUM CAPACITY OF STORM WATER
HORIZONTAL DRAIN PIPING FLOWING FULL

Pipe Diameters (in inches)	Maximum Capacities in Gallons Per Minute) Pitch of Piping Per Foot			
	1/16 inch	1/8 inch	1/4 inch	1/2 inch
3	25	35	50	70
4	50	75	115	145
5	97	140	195	270
6	160	230	320	450
8	355	500	700	1,000
10	680	950	1,300	1,940
12	1,050	1,580	2,200	3,150
15	2,000	2,800	4,050	5,640
18	3,300	4,675	6,700	9,500
21	6,020	6,910	9,880	14,400
24	7,200	10,060	14,700	21,000

(b) Vertical conductors for storm water.

1. A vertical conductor for storm water shall not be smaller than the largest horizontal branch connected thereto.

2. Vertical conductors shall be sized in accordance with Table 82.36-5 or the diameter D, where

$$D = 1.128 \sqrt{\frac{A}{X}}$$

Where,

A = the area of the roof in square feet

X = 300 square feet per square inch for a roof covered with gravel or slag and with a pitch not exceeding 1/4 inch per foot; or

= 250 square feet per square inch for a roof covered with gravel or slag and with a pitch of greater than 1/4 inch per foot; or

= 200 square feet per square inch for a roof with a metal, tile, brick or slate covering and of any pitch.

Table 82.36-5
MINIMUM DIAMETER OF VERTICAL CONDUCTORS

Type of Roof	Maximum Roof Areas (in square feet) Pipe Diameters (in inches) 2 1/2	3	4	5	6	8
Roofs covered with gravel, slag or similar material and with a pitch of 1/4" per foot or less.	1,645	2,120	3,780	5,885	8,490	15,125
Roofs covered with gravel, slag or similar material and with a pitch grater than 1/4" per foot.	1,220	1,770	3,150	4,905	7,075	12,600
Roofs covered with metal, tile, brick, slate or similar material and of any itch.	975	1,415	2,520	3,925	5,660	10,080

Note: Divide square footage by 26 to obtain flow in gpm.

A-53.15 LOAD COMBINATIONS. It is the intent of this section that the loads specified in ss. COMM 53.10 through 53.14 be considered to act in the following combinations, whichever is critical, for the design of the building frame, foundation or structural member:

1. *Dead load plus live load.*
2. *Dead load plus wind load.*
3. *Dead load plus live load plus wind load.*
4. *Dead load plus live load plus crane loads.*

Distribution of live loads which would cause the maximum shear, bending moment or stress in structural members should be investigated.

COMM 53.12 WIND LOADS.

(1) LOADING. Every building (including all components of the exterior wall) and structure shall be designed to resist a minimum total wind load in accordance with the following table:

Up to 50 feet.....20 psf

Over 50 to 100 feet.....25 psf

Over 100 to 150 feet.....30 psf

Over 150 to 200 feet.....35 psf

Over 200 feet.....40 psf

The wind pressure shall be taken on the gross area of the vertical projection of the building or structures facing the wind. No allowance shall be made for the shielding effect of other buildings and structures. For purposes of wind load design, the height shall be measured above the average level of the adjoining ground.

Wind load analysis. *Wind load analysis procedures that are acceptable to the department may be used for the design of the main wind-force resisting system, which includes rigid or braced frames,*

roof and wall bracing diaphragms and shear walls. Cladding and structural elements directly loaded by the wind must be designed for the loads specified in (1) and (2). Such elements include siding, wall panels, roof sheathing, purlins, girts, and wall studs. Gypsumboard sheathing may be used in shear walls if sufficient data and construction details are provided.

(2) UPLIFT AND SUCTION FORCES. Buildings and structures, including attachment of roof to building or structure and anchorage of building or structure to the foundation, shall be designed and constructed to withstand a wind pressure acting outward normal to the surface equal to the values set forth in sub. (1). These suction and uplift forces need not be considered as additive to the design wind loads in the overall analysis of the building or structure. Roof overhangs, eaves, cornices, canopies and buildings open on one or more sides shall be designed and constructed to withstand an upward pressure of at least 30 PSF, unless a higher value is indicated in sub. (1).

(3) OVERTURNING MOMENT. The overturning moment due to wind load shall not exceed 2/3 of the moment of stability due to dead load only, unless the building or structure is anchored to foundations of sufficient weight to resist this force. The weight of earth superimposed over footings may be used to calculate the dead load resisting moment. Sufficient diaphragm bracing, diagonal bracing or rigid connections between uprights and horizontal members shall be provided to resist distortions.

(4) SHAPE FACTORS. The following shape factors may be used for the design of structures such as chimneys, tanks and solid towers in conjunction with sub. (1).

Horizontal Cross Section	Shape Factors
square or rectangular	1.0
hexagonal or octagonal	0.8
round or elliptical	0.6

(5) WIND LOAD ANALYSIS. More exact wind load analysis will be acceptable if a recognized procedure is used.

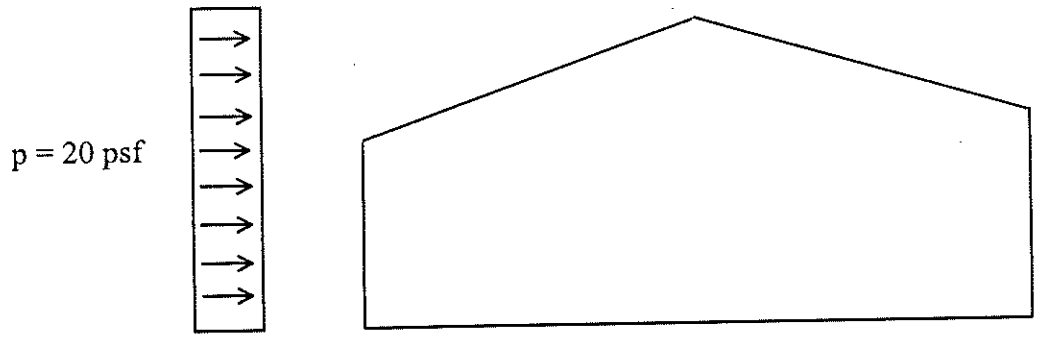
*The use of more exact wind load analysis **procedure** is acceptable to the department. The designer should be careful that the analysis does not reduce the initial required load in 53.12 (1). The analysis also should not reduce the required loading by terrain or shielding effects of surrounding buildings or trees as identified in 53.12 (1).*

***Question:** Are deflection limitations listed in the code requirements?*

***Answer:** No. Deflection, with the exception of severe cases, is normally a serviceability problem which does not lead to structural failure. The Building Code only addresses minimum requirements for safety and therefore does not recognize deflection as it is more of a comfort level issue. Load tables of manufactured products may be based on deflection limitations. These tables should be followed as they are more conservative than shear or moment tables.*

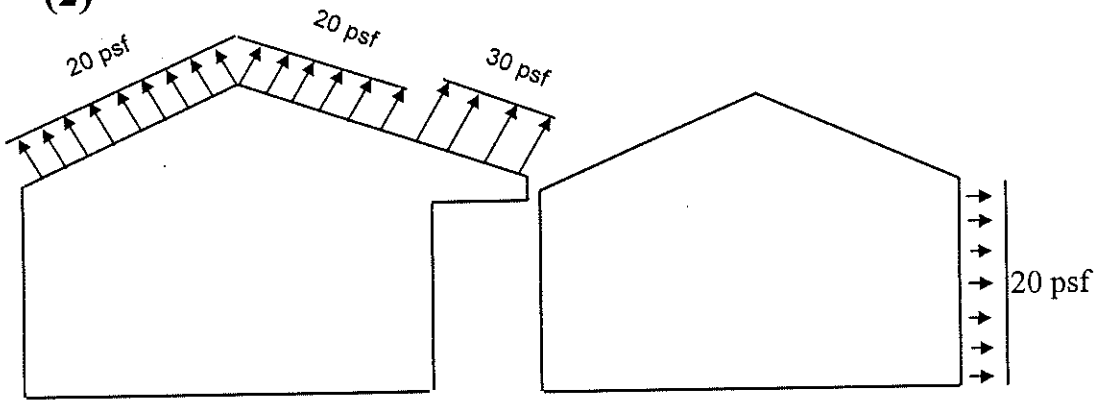
Note: The department will accept recognized procedures such as, but not limited to Department of Navy, Bureau of Yards and Docks, NAVFAC DM-2 (Dec. 1967); or "Wind Forces on Structures," by the Structural Division of ASCE Test Committee on Wind Forces (ASCE Transactions, Vol. 126, Part II, Paper No. 3269).

(1)

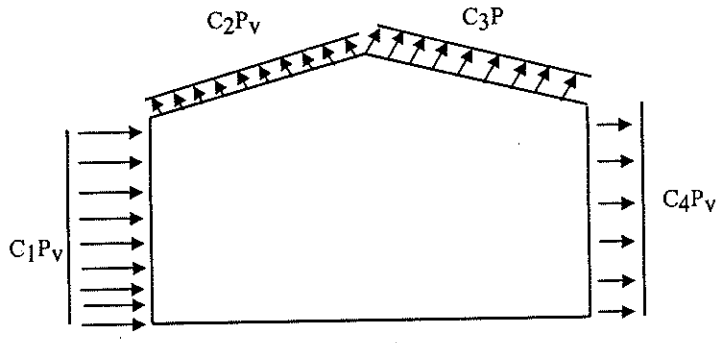


Effects of (1) and (2) are not additive.

(2)



(5)



More exact analysis considers:

- Height/width ratio
- Roof slope
- Openings
- Velocity wind pressure, P_v

For comparison with (1)

$(C_1 + C_4)\, P_v = P$

Where P = specified wind pressure

COMM 53.12

Wind Loads

COMM 53.13 IMPACT LOADS.

Structural elements carrying live loads which induce impact shall have the live loads increased by the following minimum percentages in the structural design consideration of the forces:

For supports of elevators 100

For traveling crane support girders, monorail supports, and their connections:

Cab operated cranes 25

Top running pendant operated cranes 10

Underhung and monorail cranes 25

For supports of light machinery 20

For supports of vibrating machinery or power driven units 50

For hangers supporting floors and balconies 33

COMM 53.14 HORIZONTAL AND LONGITUDINAL CRANE FORCES.

The lateral force on crane runways shall be equal to 20% of the sum of the crane capacity and the crane trolley (but exclusive of other parts of the crane). The force shall be assumed to be applied at the top of the rail, one-half on each side of the runway, and shall be considered acting in either direction normal to the runway rail. The longitudinal force (in the direction of rail) shall be taken as 10% of the maximum wheel loads of the crane applied at the top of the rail.

COMM 53.15 LOAD COMBINATIONS.

Allowable stresses may be increased 33 1/3% when wind loads are acting in combination with dead, live and impact (if any) loads. The section computed on this basis shall be not less than that required for the design dead, live and impact (if any) loads, computed without the 33 1/3% stress increase. The most severe distribution, concentration and combination of design loads and forces shall be taken into consideration, as specified in s. COMM 53.11.

As indicated in the scope of this chapter, "accepted engineering practice" can permit slight variation on issues found within the code provided other areas are not compromised. One example is the use of the LRFD methodology of steel design. Although we can permit such a use, it must be used in its entirety without modification which would be "less" than required. When using that standard, you are reminded that the 33 1/3% stress increase will not be permitted.

COMM 53.16 STABILITY.

(1) GENERAL.

(a) Provisions shall be made to assure stability of the structure as a whole and lateral, torsional and local stability of all structural parts.

(b) Instability, including sway effects or lateral displacement, produced by vertical loads or vertical and lateral loads acting on the structure shall be taken into account in the design of all structures and structural members.

(2) CALCULATIONS AND TESTING.

(a) Calculations verifying structural stability shall be submitted under s. COMM 50.12 (4) (a) and (b) when requested.

(b) Bracing systems, for which the strength and stiffness cannot be calculated, shall be substantiated by test reports.

Question: Does the State of Wisconsin require seismic design?

Answer: No. At this time the Wisconsin code does not require seismic design for buildings or structures. With the State of Wisconsin in the lowest probability zone for seismic activity based on ANSI/ASCE A7, in most cases, wind load design will control over seismic design.

COMM 53.17 INTERIOR NONLOAD-BEARING WALLS AND PARTITIONS.

Interior nonload-bearing walls and permanent partitions more than 6 feet in height shall be designed to resist a lateral load of not less than 5 pounds per square foot of wall area. Movable or folding partitions are not required to meet the load criteria but shall be anchored to the supporting structure if their height exceeds 6 feet.

Subchapter II — Foundations

COMM 53.20 GENERAL.

All submittals for plan examination of new buildings or structures, and for the alteration of a permanent structure which requires changes in foundation loads and distribution, shall have the soil types and bearing capacities (indicating verified or presumptive) used in the design of footing and foundations shown on the plans. Sufficient records and data to establish the soil character, nature and load-bearing capacity shall be available to the department upon request.

COMM 53.21 SOIL BEARING CAPACITY.

Bearing capacity of soils shall be determined by one of the following methods:

(1) VERIFIED. The soil shall be subjected to field or laboratory tests to determine its bearing capacity. A report, certified by a registered architect or registered professional engineer, shall be available to the department upon request.

(2) PRESUMPTIVE.

(a) The type of soil under buildings shall be assigned a value not exceeding the bearing capacity, in pounds per square foot, as specified in Table 53-II. The type of soil shall be determined by explorations made at or adjacent to the site. The actual loading of the soil shall not exceed the specified bearing capacity unless verified by a written report as explained in sub. (1).

TABLE 53-II
PRESUMPTIVE SOIL BEARING VALUES

Type of Soil	PSF
1. Wet soft clay; very loose silt; silty clay	Verified method s. COMM 53.21 (1)
2. Loose fine sand; medium clay; loose sandy clay soils	2,000
3. Stiff clay; firm inorganic silt	3,000
4. Medium (firm) sand; loose sandy gravel; firm sandy clay soils; hard dry clay	4,000
5. Dense sand and gravel; very compact mixture of clay, sand and gravel	6,000
6. Rock	12,000

(b) The presumed soil bearing values shall be confirmed by exploring the type of soil to a depth of at least 5 feet below the footings during or before construction. The designer shall submit a report of confirmation to the department upon request.

(c) Where the bearing materials directly under a foundation overlie a stratum having smaller allowable bearing values, such smaller values shall not be exceeded at the level of such stratum.

COMM 53.22 UNPREPARED FILL MATERIAL, ORGANIC MATERIAL.

No foundation of buildings or structures shall be placed upon unprepared fill material, organic soil, alluvial soil or mud unless evidence has been presented to the department showing that the proposed load will be adequately supported. This evidence shall be in the form of a written report and shall be based on soil analyses, load tests or other acceptable criteria.

Note: The decomposition of organic material in landfill sites established for the disposal of organic wastes may produce odorous, toxic and explosive concentrations of gas which may seep into buildings through storm sewers and similar underground utilities unless provisions are taken to release the gases to the atmosphere.

COMM 53.23 FROST PENETRATION.

(1) DEPTH. Footings and foundations shall be placed below the frost penetration level, but in no case less than 42 inches below adjacent ground. Such footings shall not be placed over frozen material.

Frost Penetration. *Frost penetration depths of more than 42 inches may occur in areas without sod cover or where there is snow removal, especially in the central and northern parts of the state. Local building codes may require footings and foundations to be placed at a greater depth.*

(2) FLOATING SLABS AND GRADE BEAMS. The edges of floating slabs and grade beams need not be installed below the minimum frost penetration provided adequate measures have been taken to prevent frost forces from damaging the structure.

(3) WALKS, STOOPS AND RAMPS ADJACENT TO REQUIRED EXITS. The edges of walks, stoops or ramps or the footing and foundation of walks, stoops or ramps need not be installed below the minimum frost penetration line provided adequate measures have been taken to prevent frost forces from damaging the structure or affecting the structure in such a manner as to obstruct the exit.

Stoops. *(Also see COMM 51.16 commentary.) The walk or stoop outside an out-swinging exit door is considered to be a part of the building and requires special attention to prevent frost action from obstructing the exit.*

Note: Also see s. COMM 52.21--location and maintenance of exits.

COMM 53.24 PILING.

(1) GENERAL REQUIREMENT. Pile foundations shall be designed and installed to adequately transfer the structure loads to underlying or adjacent soil bearing strata.

(2) INSTALLATION. Piles shall be handled and installed to the required penetration by methods which leave their strength unimpaired and that develop and retain the required load bearing capacity. Any damaged pile shall be satisfactorily repaired or the pile shall be rejected.

(3) ALLOWABLE LOADS BASED ON SOIL CONDITIONS.

(a) *By driving formula.* For individual pile design loads not exceeding 40 tons per pile, the safe working load may be determined by a recognized formula or by the following formula:

$P = \frac{2WH}{S+1}$ for drop hammer

$P = \frac{2E}{S+0.1}$ for double-acting hammer

in which:

P = safe load (lbs.)

W = weight of striking part of hammer (lbs.)

H = fall of striking part of hammer (ft.)

E = manufacturer's rated energy (ft./lbs.)

S = average penetration of pile under last 6 blows (inches/blow)

(b) *Substantiation of higher allowable loads.* Allowable loads greater than 40 tons will be permitted when substantiating data justifying such higher loads is submitted to the department by a foundation designer knowledgeable in the field of soil mechanics and pile foundations and familiar with the locale of the proposed project. Substantiating data such as test borings, laboratory test results, soil profiles, and pile load tests may be required by the department. The load test shall be in accordance with the procedure outlined in ASTM D-1143.

(c) *Group pile action.* When friction piles are placed in groups, consideration shall be given to the reduction of load per pile.

(d) *Piles in subsiding areas.* Where piles are driven through subsiding fills or other subsiding strata and derive support from underlying firmer material, consideration shall be given to the downward frictional forces which may be imposed on the piles by the subsiding upper strata.

(e) *Lateral support.* Water, air and fluid soils shall not be considered as offering lateral support to piles. In any other type of material the piles may be designed as a short column. Positive permanent lateral support shall be provided at or near the top of all piles.

(4) ALLOWABLE LOADS BASED ON PILE MATERIAL STRENGTH.

(a) The compressive stress in any cross section of a pile shall not exceed the normal allowable compressive stress of the material used for the pile, except as given in sub. (5). The piles may be designed as short columns except as stated in sub. (3)(e).

(b) *End-bearing piles.* For end-bearing piles more than 40 feet in length, it may be assumed that 75% of the load is carried by the tip, except for piles installed in a material referred to in s. COMM 53.22.

(c) *Friction piles.* For friction piles, the full load shall be computed at the cross section located at two-thirds of the embedded length of the pile measured up from the tip.

(5) TYPE OF PILES.

(a) *Timber piles.* Timber piles shall conform to National Design Specifications, Part X. In addition, the tops of treated piles, at cutoff, shall be given 3 coats of hot creosote, followed by a coat of coal-tar pitch; and the cutoff shall be encased not less than 4 inches in concrete footing of the foundation.

(b) *Precast concrete piles.* Precast concrete piles shall be cast in one piece and shall attain a compressive strength of not less than 3,000 psi prior to driving. There shall be a minimum concrete covering of 2 inches over all reinforcing bars. Precast concrete piles shall be designed to resist stresses induced by handling, driving and superimposed loads.

(c) *Cast-in-place concrete piles.* All concrete for cast-in-place piles shall develop a compressive strength of not less than 3,000 psi. Reinforcement shall have a concrete cover of one inch in cased piles and 2 inches in uncased piles.

1. Uncased piles. Cast-in-place piles in contact with earth shall be limited in length to 30 times the average diameter of the pile. The allowable compressive stress in concrete shall not exceed 0.33 f'c. The concrete shall be deposited in a shaft free of foreign matter in a continuous operation so as to ensure a full sized pile without voids or segregation.

2. Metal formed piles. Cast-in-place piles in contact with a steel shell or casing shall have a minimum tip diameter of 8 inches and a minimum average diameter of 10 inches. The shell and casing shall be sufficiently strong to resist collapse and sufficiently watertight to exclude water and foreign material during the placing of concrete. The shell or casing cannot be considered as a load-carrying part of the pile. The allowable compressive stress in concrete shall be as stated for uncased piles, but it may be increased to a maximum value of 0.40 f'c if the following conditions are satisfied:

a. The thickness of casing is not less than 0.0747 inches (14 ga AISI).

b. The casing is seamless or is provided with seams of strength equal to that of the casing.

c. The pile diameter is not greater than 18 inches.

(d) *Concrete-filled pipe and tapered tubular piles.* Concrete-filled pipe and tapered tubular piles may be driven open-ended or closed-ended. Pipe or tapered tube piles driven with closed ends shall be treated as a cast-in place concrete pile with metal casing and shall be covered by the same regulations applicable thereto with suitable load-bearing allowance made for the metal casing. When driven open-ended to rock, no concrete shall be deposited until the pipe is cleaned free of all soil or loose rock chips and satisfactory proof furnished of the condition of the rock. The allowable stress in steel is .35 Fy but shall not exceed 12,600 psi. The minimum wall thickness of all load-bearing pipe, tube and shells shall be 1/10 inch. When the soil surrounding the pile contains destructive chemical elements, the pile shall be provided with an approved protective jacket or coating which will not be rendered ineffective by driving.

(e) *Structural steel piles.* No section shall have a nominal thickness of metal less than 3/8 inch. When an H-shaped section is used, the flange projection shall not be more than 14 times the minimum thickness of metal. The steel stress shall not exceed 0.35 Fy.

COMM 53.25 SETTLEMENT.

Where footings or floating slabs are placed upon clays or other materials which are subject to settlement, an analysis for such buildings shall include consideration of total and differential settlements anticipated.

COMM 53.26 PROTECTION OF ADJOINING PROPERTY.

(1) Any property owner (owner of an interest in land) making or causing an excavation to be made to a depth of 12 feet or less, below the grade, shall protect the excavation so that the soil of adjoining property will not cave in or settle, but shall not be liable for the expense of underpinning or extending the foundation of buildings on adjoining properties where the excavation is not in excess of 12 feet in depth. Before commencing the excavation, the person making or causing the excavation to be made shall notify in writing the owners of adjoining buildings not less than 30 days before such excavation is to be made and that the adjoining

buildings should be protected. The owners of the adjoining property shall be given access to the excavation for the purpose of protecting such adjoining buildings.

(a) *Exception.* The 30-day time limit for written notification may be waived if such waiver is signed by the owner of adjoining properties.

(2) Property owners (owners of an interest in land) making or causing an excavation to be made exceeding 12 feet in depth below the grade shall protect the excavation so that the soil of adjoining property will not cave in or settle, and shall extend the foundation of any adjoining buildings below the depth of 12 feet below grade at their own expense. The owner(s) of the adjoining buildings shall extend the foundations of their buildings to a depth of 12 feet below grade at their own expense as provided in the preceding paragraph.

Excavation by Property Lines. *Responsibility for the protection of an adjoining property during excavation is established by Section 101.111 of the Wisconsin Statutes. The law has provision for compliance through a court order. A building inspector normally would not need to cite the rule unless it is apparent that adequate precautions are not being taken or if a complaint is received from one of the affected parties.*

The term "extend the foundation" may be interpreted as any engineering method for supporting the foundation loads that is acceptable to the owner of the adjoining property.

COMM 53.27 CUT OR FILL SLOPES.

PERMANENT CUT OR FILL SLOPES. Cuts or fills adjacent to any building, structure or property line shall be so constructed or protected that they do not endanger life and/or property. Permanent cut slopes shall not be steeper than 1 1/2 horizontal to one vertical and permanent fill slopes shall not be steeper than 2 horizontal to one vertical unless substantiating data justifying steeper slopes are submitted.

COMM 53.28 POLE FOUNDATIONS.

Structures that use poles embedded in earth or embedded in concrete footings in the earth to resist axial and lateral loads shall have their depth of embedment determined as specified in this section.

Pole foundation requirements apply where the structural design analysis depends on the depth of pole embedment for resistance to wind forces or other lateral loads.

(1) CONSTRUCTION BACKFILL REQUIREMENTS. The space around the pole shall be backfilled in accordance with one of the following methods:

(a) The hole shall be made 4 inches larger than the diameter or diagonal dimension of rectangular or square poles. It shall be backfilled with 2,000 psi concrete.

(b) The backfill shall be of thoroughly compacted clean sand.

(2) ALLOWABLE LATERAL SOIL PRESSURE. In the design of nonrestrained and restrained poles, unless a more exact soil analysis method is used, the allowable passive soil pressure shall be determined in accordance with Table 53-III.

The allowable lateral soil-bearing pressure (S) is increased by multiplying the tabulated value (p) by each foot of depth to a maximum of 12 times p. For unrestrained poles, the value (S) is reduced to 1/2 of pd. Poles used for signs, open shelters, storage sheds and similar structures may be designed using lateral pressures equal to two times the tabulated value (p) per foot of depth, but not exceeding 12 times p.

TABLE 53-III
ALLOWABLE LATERAL SOIL PRESSURE

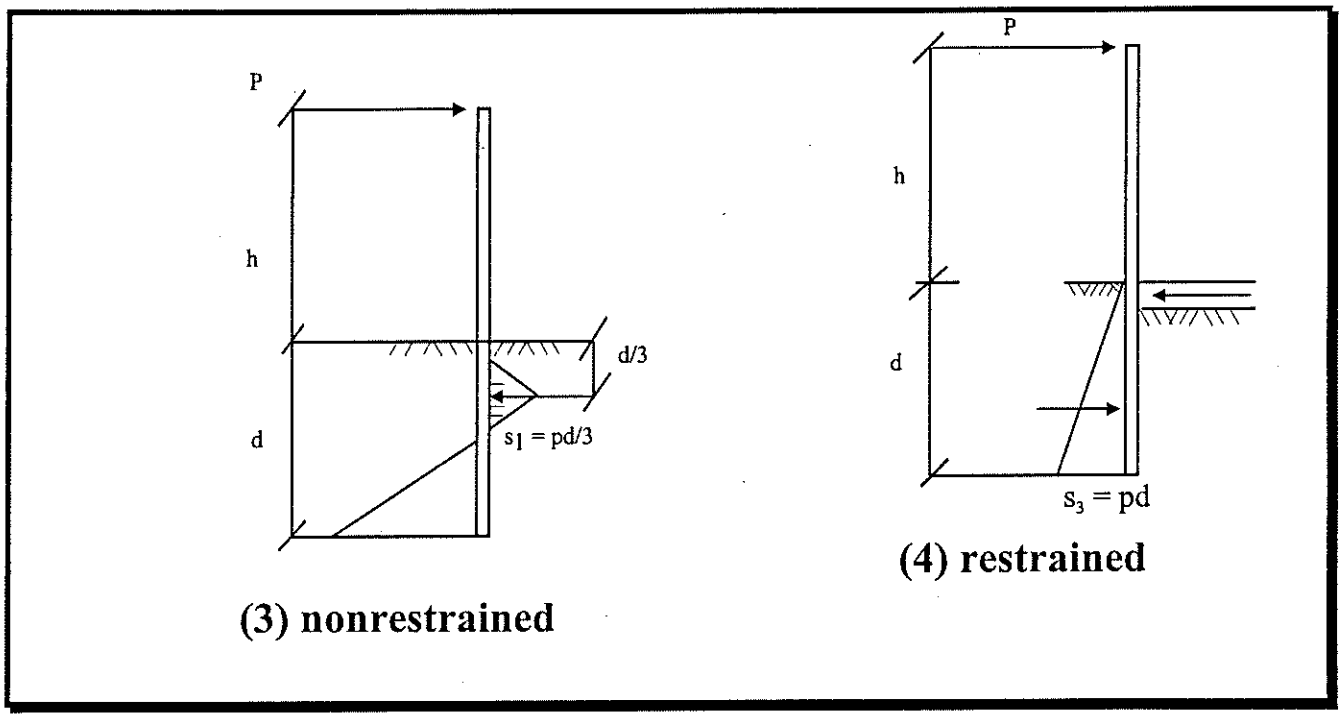
Soil Types (see Table 53-II)	Allowable Passive Soil Pressure (p)[1] psf per foot of depth below grade[2 3]
1 and 2 (not well drained)	100
2 (well drained)	150
3 (well drained	200
4 (well drained)	300
5 and 6 (well drained)	400

[1] S_1 and S_3 values shall not exceed 12 times the allowable passive soil pressure (p).

[2] Values may be increased 33 1/3% for wind loads.

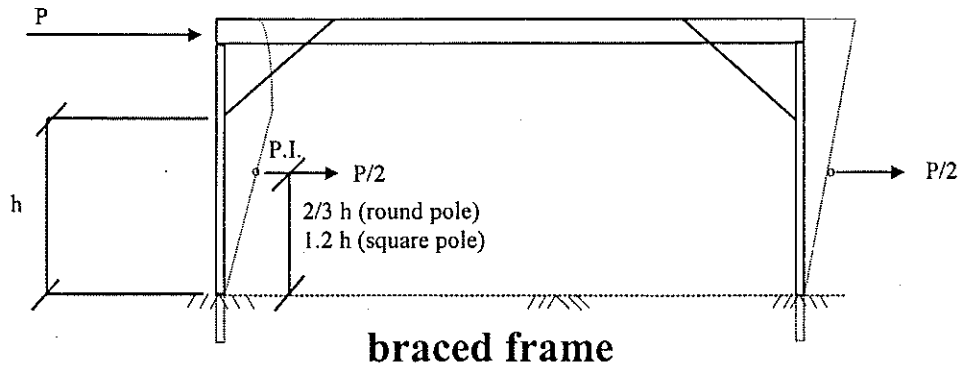
[3] Where 1/2-inch horizontal movement of the pole at ground surface can be tolerated, the values shown in Table 53-III may be increased 100%, provided the individual poles are spaced a minimum distance of 6 times B center to center.

(3) DESIGN-NONRESTRAINED POLES. The following formula shall be used in determining the depth of embedment required to resist lateral loads where no restraint is provided at the ground surface, unless other methods are approved by the department.



(3) nonrestrained

(4) restrained



braced frame

(approximate analysis)
other locations of P.I. and distribution of
lateral forces are acceptable

COMM 53.28 Pole Foundation

For poles embedded in earth, with no floor slab provided, S_1 is the lateral soil-bearing pressure at a depth of one-third the total depth of embedment.

$$d = \frac{A}{2}\left(1 + \sqrt{1 + \frac{4.36h}{A}}\right)$$

where: d = depth of embedment, ft.

$$A = \frac{2.34\,P}{S_1\,B}$$

P = applied horizontal force on pole, lb.

S_1 = pd/3, see Table 53-III

Note: For first approximation of "d," the following formula may be used:

$$d = \sqrt[3]{\frac{12\,hp}{Bp}}$$

B = Diameter of concrete casing, ft.; when nonencased in concrete, diameter or diagonal dimension of square or rectangular pole, ft.

h = Height above the ground, in feet, at which the force "P" is applied. If the pole has fixity at the top, such as provided by a knee brace, the force "P" acts at the inflection point. The inflection point may be assumed at 2/3 of the distance from the ground to the knee brace for round poles, or 1/2 of the distance from the ground to the knee brace for square poles.

p = Allowable lateral passive soil pressure, psf.

Note #2: When a frame analysis is used, h = M/P, where M = bending moment on the pole at the ground surface.

(4) DESIGN-RESTRAINED POLES. Where restraint is provided at the ground surface, such as a rigid floor or pavement, the depth of embedment shall be in accordance with the following formula:

Where lateral movement is prevented by a floor slab, S_3 is the lateral soil-bearing pressure at the bottom of the pole.

$$d = \sqrt{\frac{4.25\, h\, P}{S_3\, B}}$$

where: S_3=pd, see Table 53-III

(5) PRESERVATION. All poles subject to moisture shall be treated with a preservative. Preservative treatment shall be in accordance with AWPA C2 or AWPA C4. All poles treated for preservation shall bear the mark of a quality control certification agency.

Subchapter III — Masonry

COMM 53.30 GENERAL.

(1) SCOPE. The requirements of ss. COMM 53.30 through 53.36 herein shall apply to the design, construction and materials used in all masonry and similar work under this code.

Question: *Is the design manual ACI 530-88/ASCE 5-88 and ACI 530.1-88/ASCE 6-88 an acceptable document for masonry design?*

Answer: *Yes. The department will accept the use of this document for engineered masonry in accordance with COMM 53.323.*

(2) DEFINITION. Masonry as used herein shall be considered as any built-up construction or combination of building units or materials of clay, shale, concrete, stone, gypsum, glass, metal or other approved units.

(3) DIMENSIONS. Dimensions specified herein are nominal unless otherwise stated. The actual dimensions may vary from the nominal by the thickness of a mortar joint, but not more than one-half inch.

Part III -- Masonry

PARTIAL MASONRY OUTLINE

53.30 GENERAL

53.31 MATERIALS

53.31 MASONRY UNITS

(1) General
(2) Clay and shale units
(3) Concrete units
(4) Natural stone
(5) Cast stone
(6) Architectural precast concrete
(7) Gypsum units
(8) Miscellaneous units

53.312 MORTAR

53.313 MASONRY GROUT

53.314 CEMENTITIOUS MATERIALS

53.315 WATER

53.316 REINFORCING, TIES AND ANCHORS

53.32 DESIGN

53.321 TYPES OF MASONRY

53.322 EMPIRICAL METHOD OF DESIGN

(1) Stresses
(2) Thickness and height
(3) Lateral support
(4) Openings
(5) Bonding
(6) Anchorage
(7) Jointing

53.323 ENGINEERED MASONRY

PARTIAL MASONRY OUTLINE

(Continued)

53.33 CONSTRUCTION

(1) Cold weather work

(2) Workmanship for load-bearing masonry

(3) Cleaning

53.34 MISCELLANEOUS DESIGN - CONSTRUCTION DETAILS

(1) Special use walls

(2) Changes in thickness or plane

(3) Bearing

(4) Jointing

(5) Bolts and anchors

53.35 TESTS

53.36 VENEER, FURRING AND TRIM

(1) General

(2) Material requirements

(3) Thickness

(4) Bearing and backing supports

(5) Attachment

(6) Jointing

COMM 53.31 MATERIALS.

(1) GENERAL REQUIREMENTS. Components used in the construction of masonry shall be as required in ss. COMM 53.311 through 53.316.

(2) LABELING. All packaged materials shall be clearly identified by name (portland cement, masonry cement, lime, gypsum, etc.) and applicable standards which are met.

COMM 53.311 MASONRY UNITS.

(1) GENERAL.

(a) *Solid and hollow units.* A solid masonry unit is a unit whose net cross-sectional area in every plane parallel to the bearing surface is 75% or more of its gross cross-sectional area measured in the same plane. A hollow masonry unit has a net cross-sectional area less than 75% of its gross cross-sectional area.

(b) *Quality.* All masonry units shall be free from cracks, laminations and other defects or deficiencies, including admixtures and coatings, which may interfere with proper laying of the unit or impair the strength or permanence of the structure.

(c) *Used masonry units.* Masonry units may be reused when clean, whole and conforming to requirements for new masonry units.

(d) *Marking requirements.* Masonry units shall be of distinctive design or appearance, or marked so that the manufacturer is identified, as required by the department.

(e) *Surface condition at time of use.* Every masonry unit shall have all surfaces, to which mortar or grout is to be applied, capable of developing the required strength and bond. Coating or facings permitted and applied to masonry unit surfaces prior to their installation shall not supersede this requirement.

(f) *Positioning in structure.* Hollow masonry units shall be laid only in positions as tested for compliance.

(2) CLAY AND SHALE UNITS. Clay and shale units shall be made of burned clay or shale or mixtures thereof with or without admixtures.

(a) *Solid units (brick).* Units shall conform to grade SW requirements of ASTM C-62.

(b) *Hollow units (tile and hollow brick).*

1. Load-bearing units. Units for use in load-bearing and exterior walls shall conform to grade LBX requirements of ASTM C-34 or grade SW requirements of ASTM C-652.

2. Nonload-bearing units. Units for use in nonload-bearing partitions shall be specially marked and shall conform to the requirements of ASTM C-56. Such units may also be used for nonstructural purposes in concrete floor construction.

3. Units for floor construction. Units for structural use in floor construction shall conform to grade FT 1 requirements of ASTM C-57.

(3) CONCRETE UNITS. Concrete units shall be made with portland cement, water and suitable mineral aggregates, with or without admixtures.

(a) *Solid units.*

1. Small units (brick). Units shall conform to grade N requirements of ASTM C-55.

2. Large units (solid block). Units shall conform to grade N requirements of ASTM C-145.

(b) *Hollow units (blocks).* Units shall conform to grade N requirements of ASTM C-90.

(4) NATURAL STONE. All natural building stone for use in masonry shall be sound and free from loose or friable inclusions, and shall meet the strength and fire resistance requirements for the proposed use. Where the cleavage plane of stone units is pronounced, the stone shall be laid only on its natural bed. Stone exposed to soil, weather or frost action shall be such that the strength and structure of the stone will not be affected when so exposed.

(5) CAST STONE. Units covered under this category are homogeneous or faced, dry cast concrete products other than conventional concrete masonry units (brick or block), but of similar size.

(a) *Composition.* Units shall be made with portland cement, water and suitable mineral aggregates, with or without admixtures, and reinforced if required.

(b) *Standards.* Units shall have a minimum compressive strength of 6500 psi and a maximum water absorption of 6% when tested as 2 x 2 inch cylinders or cubes.

(6) ARCHITECTURAL PRECAST CONCRETE. Units covered under this category are homogeneous or faced, wet cast nonload-bearing concrete products. Load-bearing precast concrete units shall conform to the requirements of s. COMM 53.40.

(a) *Composition.* Units shall be made with portland cement, water and suitable aggregates, with or without admixtures, and reinforced as required.

(b) *Standards.* Units shall conform to the requirements of Table 53-IV.

TABLE 53-IV
ARCHITECTURAL PRECAST CONCRETE PHYSICAL REQUIREMENTS

Use	Compressive Strength† Minimum (psi)		Water Absorption Maximum (%)	Purposefully Entrained Air Minimum (%)
	Avg. of 3	Individual		
Exposed to freeze-thaw cycles (exterior)	4,500	3,800	8	3
All others (interior)	3,500	3,000	10	--

†Compressive strength shall be determined by procedures outlined in ASTM C-39 or C-42.

(7) GYPSUM UNITS. Units shall conform to the requirements of ASTM C-52. Gypsum units shall not be used in exterior or load-bearing walls or locations exposed to frequent or continuous wetting.

COMM 53.312 MORTAR.

(1) GENERAL. Mortar as used herein shall be considered as a mixture containing cementitious materials used to permanently bond masonry or other structural elements.

(2) MORTAR FOR UNIT MASONRY.

(a) *Composition.* Conventional mortar shall be composed of cementitious materials, fine aggregates and water. Suitable admixtures are allowed.

(b) *Standards.* All materials used as ingredients in mortar when delivered to the mixer shall conform to the requirements outlined below:

1. Cementitious materials. See s. COMM 53.314.

2. Aggregates. Aggregates shall conform to the following requirements and to the requirements of ASTM C-144.

a. Aggregates shall be graded within the limits of Table 53-V.

TABLE 53-V

MASONRY SAND GRADATION REQUIREMENTS

Sieve Size	Percentage Passing	
	Natural Sand	Manufactured Sand
No. 4	100	100
No. 8	95 to 100	95 to 100
No. 16	70 to 100	70 to 100
No. 30	40 to 75	40 to 75
No. 50	10 to 35	20 to 40
No. 100	2 to 15	10 to 25
No. 200	--	0 to 10

b. The aggregate shall have not more than 50% retained between any 2 consecutive sieves of those listed in Table 53-V, nor more than 25% between the No. 50 and No. 100 sieves.

c. If the fineness modulus varies by more than 0.20 from the value assumed in selecting proportions for the mortar, suitable adjustments shall be made in proportions to compensate for the change in grading.

3. Water. See s. COMM 53.315.

4. Admixtures. Where metal ties, anchors or reinforcement are embedded in masonry, chloride, nitrate and sulphate base salts or materials containing same shall not be used in masonry construction.

(c) *Requirements.* Mortar for masonry shall conform to the property requirements of Table 53-VI and to the requirements of ASTM C-270 unless otherwise noted in this section. If approved laboratory testing is not conducted to indicate compliance with Table 53-VI, the mortar mix shall be restricted to the provisions of Table 53-VII.

TABLE 53-VI

MORTAR PROPERTY REQUIREMENTS

Mortar Type	Compressive Strength† Min. (psi)	Water Retention Min. (%)	Air Content Max. (%)
M	2,500	75	18
S	1,800	75	18
N	750	75	18
O	350	75	18

† See s. COMM 53.35 (3).

TABLE 53-VII
MORTAR PROPORTION RESTRICTIONS

	Cementitious Materials (Proportions by Volume) Mortar Type			Aggregate (Measured in a damp loose condition)
	Portland Cement	Masonry Cement	Lime	
Lime Cement Mortar				
M.....	1	--	1/4	Not less than 2 1/4 and not more than 3 times the sum of the separate volumes of cementitious materials.
S.....	1	--	Over 1/4 to 1/2	
N.....	1	--	Over 1/2 to 1 1/4	
O.....	1	--	Over 1 1/4 to 2 1/2	
Masonry Cement Mortar				
M.....	1	1	--	
S.....	1/2	1	--	
N.....	--	1	--	
O.....	--	1	--	

(3) GYPSUM MORTAR.

(a) *Standards.* Gypsum mortar shall be composed of one part of unfibered calcined neat gypsum to not more than 3 parts sand by weight, with sufficient water added for workability.

(b) *Use restrictions.* Gypsum mortar shall be used only with gypsum tile and block units or as fireproofing.

(4) MISCELLANEOUS MORTARS.

(a) *High bond mortars.* See s. COMM 50.19 for all such mortars, glues and special additives.

(b) *Special use mortars.* See Table 53-VIII.

(5) BOND. It is required that sufficient bond be developed to hold the masonry assemblage together and let it act as a single unit.

Note: Initial rate of absorption of masonry units and quantity of entrained air in mortar are factors affecting bond strength.

(6) MORTAR USE. Masonry shall be laid in mortar of the types listed in Table 53-VIII.

TABLE 53-VIII
MORTAR USE REQUIREMENTS

Kind of Masonry	Types of Mortar Permitted
Load-bearing or nonload-bearing masonry in contact with earth.	M or S
All other load-bearing masonry.	M, S or N
Nonload-bearing masonry in exterior and exposed locations where a high degree of resistance to frost action is desired.	M, S, or N
All other nonload-bearing walls and partitions.	M, S, N or O
Fireproofing	M, S, N, O or gypsum
Special masonry:	
Gypsum partition title or block	Gypsum
Firebrick or tile	Refractory air setting
Stack or chimney walls	Composed of portland cement, hydrated lime putty and aggregate

COMM 53.313 MASONRY GROUT.

Masonry grout for nonengineered masonry shall be type M, S or N mortar, as used in the construction, to which water is added to produce a consistency for pouring without segregation.

Note: Masonry grout for reinforced masonry shall conform to the requirements of ASTM C-476.

COMM 53.314 CEMENTITIOUS MATERIALS.

(1) PORTLAND CEMENT. Portland cement shall conform to the requirements of ASTM C-150.

(2) MASONRY CEMENT. Masonry cement shall conform to the requirements of ASTM C-91.

(3) HYDRATED LIME. Hydrated lime shall conform to Type S requirements of ASTM C-207.

(4) GYPSUM. Gypsum shall conform to the requirements of ASTM C-22.

COMM 53.315 WATER.

Water shall be clean and free from injurious amounts of oil, acid, alkali, salt, organic matter and other deleterious substances.

COMM 53.316 REINFORCING, TIES AND ANCHORS.

(1) REINFORCING BARS. Reinforcing bars shall conform to the requirements of ASTM A-615, A-616 and A-617.

It should be noted that the reference to A-165 is a typographical error and should read A-615.

(2) CONTINUOUS JOINT REINFORCEMENT.

(a) *Material.* Ties shall be fabricated from the equivalent of cold drawn wire conforming to the requirements of ASTM A-82.

(b) *Coating.* Ties in exterior walls and potentially wet areas shall have noncorrodible cross wires for the intended use. Conformance with Class 3 requirements of ASTM A-116 is acceptable.

(c) *Assembly.* Ties shall consist of the equivalent of at least 2 No. 9 steel wire gage longitudinal wires or rods with No. 9 steel wire gage cross wires or rods spaced not over 16 inches apart along each longitudinal wire or rod electrically flush or butt welded to tie the outside wires or rods together and provide mechanical bond.

(d) *Limitations.* Ties shall be of such dimensions that they provide the following:

1. Overlap of at least 6 inches at splices.

2. Engagement of both adjacent wythes; out-to-out spacing of side rods to be approximately 2 inches less than the total wall thickness.

3. Minimum actual cover over all but the cross wires or rods of 5/8 inch clear from all masonry unit faces and their joint surfaces.

(3) INDIVIDUAL TIES AND ANCHORS.

(a) *Material.* Ties and anchors shall be fabricated from steel, brass, bronze or other approved material. See s. COMM 53.322 (5) (c) 1.b.

(b) *Coating.* Ties and anchors for use in exterior walls and potentially wet areas shall be noncorrodible for the intended use. Zinc coating (hot dip) conforming to the requirements of ASTM A-153 is acceptable.

(c) *Limitations.* Ties and anchors shall be of such a dimension as to engage masonry units a minimum of 2 inches on each wythe in which the tie is placed and retain a minimum actual cover of 5/8-inch clear from all exposed masonry faces and joints.

COMM 53.32 DESIGN.

(1) GENERAL REQUIREMENTS. Design of plain (nonreinforced) masonry shall be based either on the empirical method and limitations of s. COMM 53.322 or on a detailed engineering analysis according to the provisions of s. COMM 53.323. Design of reinforced masonry shall be based on the provisions of s. COMM 53.323.

Design. *The code accepts two methods of masonry design. The first is the empirical or so-called cookbook method. This method is outlined in s. COMM 53.322 and is the more commonly used method. The second method is the engineered method outlined in s. COMM 53.323.*

(2) PRACTICE. All masonry shall be designed with adequate strength and proportions to support all intended superimposed loads, resist all vertical or horizontal loads as required by this code, and comply with the fire-resistive construction requirements set forth in s. COMM 51.04.

COMM 53.321 TYPES OF MASONRY.

(1) VENEER, FURRING AND TRIM. Veneer, furring and trim comprise a facing of weather-resistant noncombustible materials securely attached to a backing, but not so bonded as to exert common action under load. See s. COMM 53.36 for requirements.

(2) PANEL WALL. A panel wall is composed of weather resisting noncombustible large masonry units, or small masonry units prefabricated into larger assemblages, securely anchored to the framing of the structure.

(3) SINGLE WYTHE WALL. A single wythe wall is one masonry unit in thickness and is built of conventional size masonry units.

(4) MULTI-WYTHE WALL. A multi-wythe wall is composed of 2 or more wythes of conventional size masonry units of the same or different materials all tied or bonded together.

(a) *Grouted wall.* A grouted wall is a multi-wythe wall with all spaces between wythes solidly filled with masonry grout, as defined in s. COMM 53.313.

(b) *Slushed or parged wall.* A slushed or parged wall is a multi-wythe wall with all spaces between wythes nominally filled with mortar.

(c) *Hollow wall (includes conventional cavity wall).* A hollow wall is a multi-wythe wall with an air space maintained between wythes. A water-repellent or water-resistant insulation may be placed between wythes. The description of a hollow wall is determined by its nominal out-to-out dimension.

(5) SPECIAL WALLS.

(a) *Stack or chimney walls.* See s. COMM 64.46 and Table 53-VIII for general requirements.

(b) *Special use walls.* See s. COMM 53.34 for special requirements.

Stresses. *The use of the empirical method is limited to cases where no tensile stresses are produced. Because of this, the engineered method might have to be used when eccentric vertical loads are applied. Allowable compressive stresses are specified in Table 53-IX. Allowable stresses are constant regardless of wall height. When the engineered method is used, the allowable compressive stress is reduced as the ratio of laterally unsupported height to thickness of wall becomes larger.*

COMM 53.322 EMPIRICAL METHOD OF DESIGN.

(1) STRESSES.

(a) *General.*

1. In determining the stresses in masonry, the effects of all loads and conditions of loading and the influence of all forces affecting the design and strength of the several parts shall be taken into account.

2. When the effects of eccentricity of vertical loads, including loads produced by the deflection of floor and roof units, are likely to cause tensile stresses in the masonry, the masonry shall be designed in accordance with the requirements of s. COMM 53.323.

(b) *Allowable stresses.*

1. Compressive stresses. The compressive stresses in masonry shall not exceed the values given in Table 53-IX.

2. Bearing stresses. See s. COMM 53.34 (3) (b).

3. Composite masonry. In composite masonry with different kinds or grades of units or mortars, the maximum stress shall not exceed the allowable stress for the weakest combination of units and mortar of which the masonry is composed.

4. Stone flexural members. The maximum allowable flexural stress for natural stone shall be 1/6 of its modulus of rupture.

5. Bolts and anchors. See s. COMM 53.34 (5).

(2) THICKNESS AND HEIGHT.

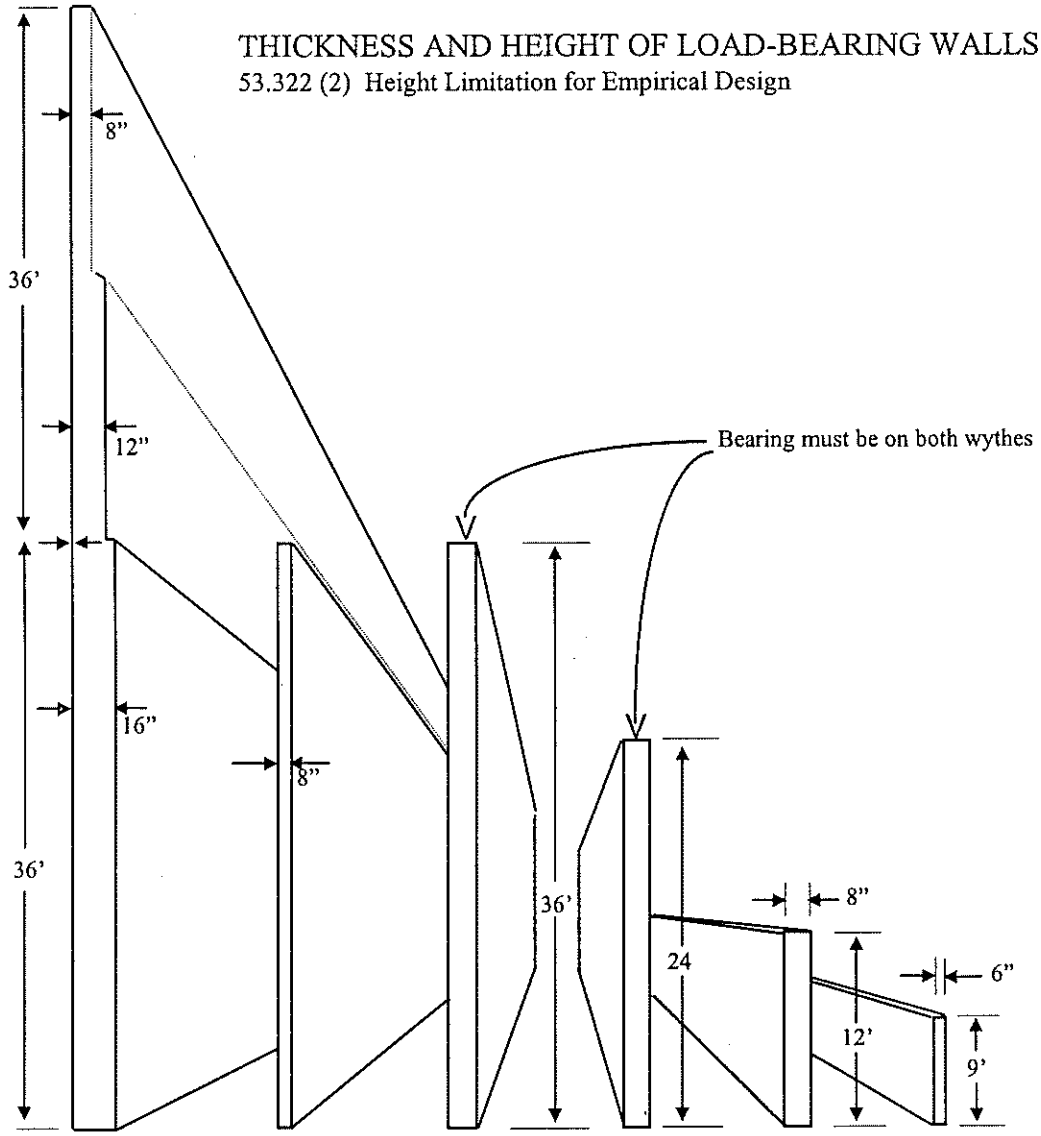
(a) *Height of masonry.* The height of a wall is defined for purposes of limitation as the maximum vertical distance between structural members completely supporting the weight of the wall or between the upper such support and the top of the wall, whichever is greater.

Thickness and height. *This section limits the height and sets minimum thicknesses for masonry designed under the empirical method. The theory is that with the limitations specified, the allowable stresses will not be exceeded. Walls supporting heavy floor loads or long spans may require analysis.*

(b) *Thickness of load-bearing walls.* Except as prescribed in par. (bm), the minimum thickness of load-bearing masonry walls shall be at least 12 inches for the upper 36 feet of their height, and shall be increased 4 inches for the lower 36 feet or fraction thereof. Where a masonry load-bearing wall is made up of 2 or more wythes, the thickness of the wall shall not include any wythe less than 4 inches thick.

THICKNESS AND HEIGHT OF LOAD-BEARING WALLS

53.322 (2) Height Limitation for Empirical Design



Apartment Buildings 4" x 1" min. 4" x 4" Roof Span <18'

SINGLE WYTHE AND SOLID WALLS	HOLLOW WALLS With metal ties (masonry ties not permitted) Cavity 0" to 4" max.	ONE STORY

COMM 53.322 (2) Thickness and Height of Load-Bearing

TABLE 53-IX
ALLOWABLE COMPRESSIVE STRESSES IN UNIT MASONRY[1]

Type of Masonry	Type of Masonry Units	Average Ultimate Compressive Strength of Masonry Unit[2] (psi)	Allowable Compressive Stresses on Gross Cross-Sectional Area[3] (psi)			
			Type M Mortar and Grout	Type S Mortar and Grout	Type N Mortar and Grout	Type O Mortar and Grout[4]
Single wythe and grouted multi-wythe masonry	Rubble stone.....	.....	140	120	100	80
	Ashlar granite.....	.....	800	720	640	500
	Ashlar limestone and marble.....	.....	500	450	400	325
	Ashlar sandstone and cast stone.		400	360	320	250
	Solid units except concrete block	10,000 and over	450	400	350	250
	.....	8,000 to 10,000	400	350	300	200
	.....	6,000 to 8,000	300	275	250	175
	.....	4,000 to 6,000	250	225	200	150
	.....	2,500 to 4,000	175	160	140	100
	Solid concrete block.....	1,800 and over	175	160	140	100
	Hollow load-bearing units.....	1,000 and over	90	80	75	60
Slushed or parged multi-wythe masonry	All allowable compressive stress values to 20% less than those for equivalent types of single-wythe and grouted multi-wythe masonry.					
Hollow multi-wythe masonry	Solid units except concrete block	2,500 and over	140	130	110	80
	Solid concrete block.....	1,800 and over	140	130	110	80
	Hollow load-bearing units.....	1,000 and over	70	60	55	40

[1] Where a type of masonry unit, mortar or grout is not provided for in Table 53-IX, it will be the practice of the department to allow a maximum compressive stress in the masonry which is no more than 15% of the ultimate compressive strength of a masonry assemblage as determined by an approved test.

[2] No individual masonry unit shall have a compressive strength of less than 80% of the average ultimate compressive strength.

[3] Stresses shall be calculated on actual dimensions rather than nominal dimensions, with consideration for reductions such as raked joints and cavities.

[4] Type O mortar is permitted only in certain nonload-bearing masonry. See Table 53-VIII.

(bm) *Exceptions to thickness of load-bearing walls.*

1. Stiffened walls. Where single wythe or grouted multi-wythe masonry load-bearing walls composed of units of the same material are laterally supported at distances not greater than 12 feet apart by masonry crosswalls or by reinforced concrete floors, they may be of 12-inch thickness for the whole 72 feet.

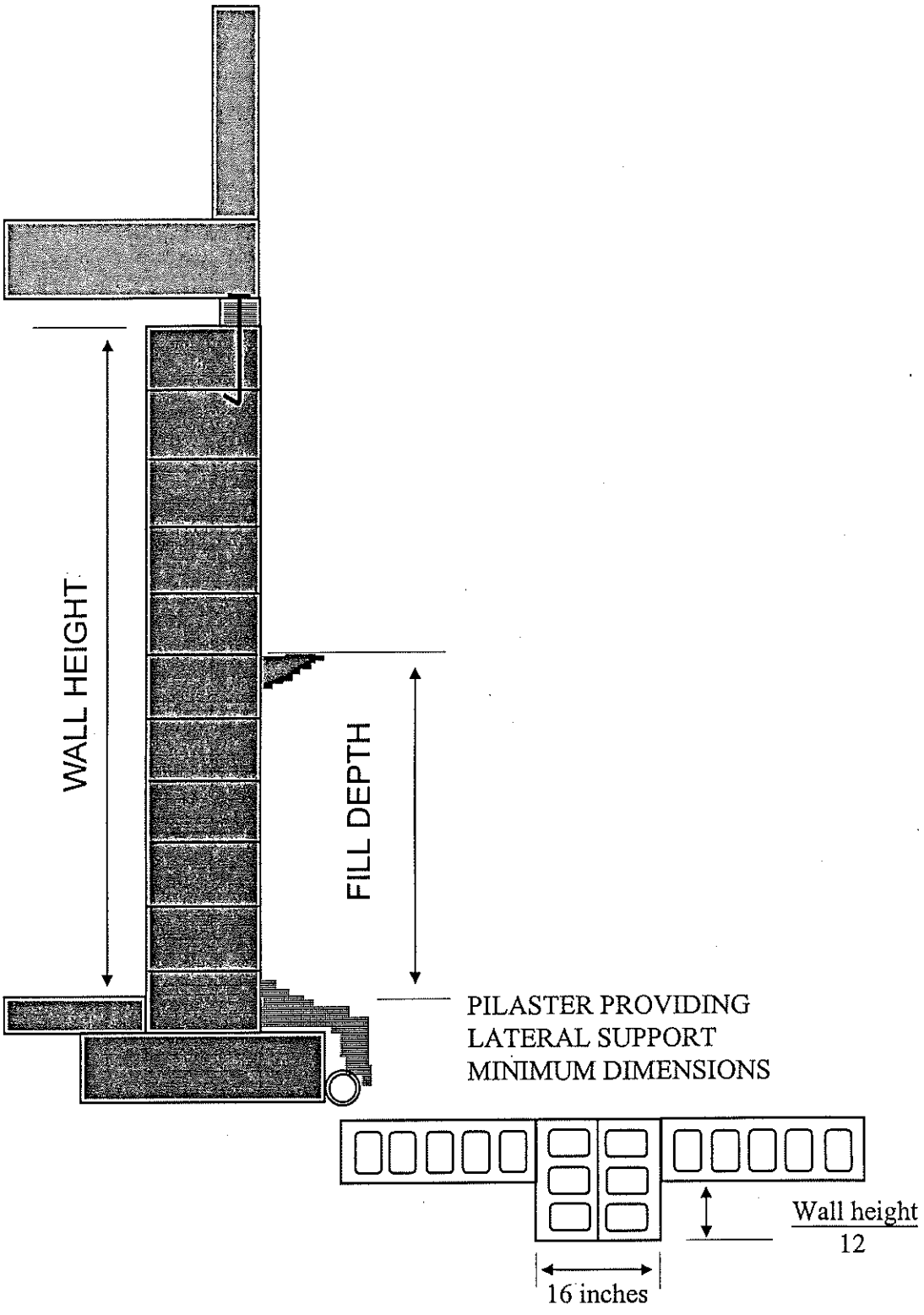
2. Top-story walls. Top-story walls may be of 8-inch thickness provided that they are not over 12 feet in height and the roof construction imparts no lateral thrust to the walls.

3. One-story walls. In one-story buildings not exceeding 9 feet in height, the walls may be of 6-inch thickness provided that the roof span does not exceed 18 feet.

4. Penthouses and roof structures. Masonry walls above the main roof level, 12 feet or less in height, enclosing stairways, machinery rooms, shafts or penthouses may be of 8-inch thickness, and may be considered as neither increasing the height nor requiring any increase in the thickness of the masonry below.

5. Walls of apartment buildings. In buildings defined as places of abode not more than 3 stories in height, walls may be of 8-inch thickness when not over 36 feet in height and the roof imparts no horizontal thrust.

6. Walls below grade shall comply with the requirements of par. (e).



MASONRY WALLS BELOW GRADE
COMM 53.322 (2)(d)

Walls below grade. *Foundation walls subject to lateral (earth) pressure are limited to a height of 8 feet if the empirical method for design is used. The minimum thickness of the wall is determined by the depth below grade and backfill conditions as indicated in Table 53-IX A. Pilasters are not required for all walls; however, the depth below grade may be increased one foot if pilasters are provided as specified in this section.*

7. Metal tied hollow walls. Hollow walls shall not exceed 36 feet in height. The space (cavity) between wythes shall be not more than 4 inches. The backing wythe shall be at least as thick as the facing wythe. When both the facing and backing wythes have a thickness of 4 inches, the height of such hollow walls shall not exceed 24 feet.

8. Masonry bonded hollow walls. Not allowed.

Note: For definition of hollow walls, see s. COMM 53.321 (4) (c).

9. Rubble stone walls. All rubble stone walls shall be 4 inches thicker than required in (b) above, but in no case less than 16 inches in thickness. Other exceptions above do not apply to rubble stone walls.

10. Composite walls. Walls containing clay and concrete masonry units shall not exceed 48 feet in height.

(c) *Thickness of exterior nonload-bearing walls and parapets.* Nonload-bearing exterior masonry walls may be 4 inches less in thickness than required for load-bearing walls including the exceptions under par. (bm), but the thickness shall not be less than 8 inches except where 6-inch walls are specifically permitted.

(cm) *Exceptions to thickness of exterior nonload-bearing walls and parapets.*

1. Panel walls. Panel walls shall be designed with sufficient strength and thickness and anchored to the structure so as to insure adequate support and resistance to wind or other lateral forces. Panel walls shall not be less than 2 inches in actual thickness and the maximum ratio of height to thickness shall not exceed 30.

2. Parapet walls. Parapet walls shall not exceed 3 times their thickness in clear height.

Thus 8-inch block cannot be used for a 3-foot parapet.

(d) *Thickness of interior nonload-bearing walls (partitions).* Nonload-bearing interior partitions shall be not less than 4 inches in thickness. Where partitions designed for lateral support at the top are not in tight contact with at least a 2-hour fire-resistive construction at the top, such partitions shall be not more than 24 times their thickness in clear height (see s. COMM 53.322 (3)(a) 3.).

(e) *Walls below grade.* Foundation walls shall be not less than 8 inches in thickness nor less than the thickness of the wall which they support. When subject to lateral pressure, foundation walls shall have lateral support at the top of the wall as specified in sub. (6). The height of wall and the depth below grade may not exceed the values specified in Table 53-IXA.

Note: The phrase "depth below grade" is intended to mean height of unbalanced fill.

1. For purposes of Table 53-IXA, "solid masonry" means solid units or hollow units with all cells grouted.

2. a. When the wall is laterally supported by vertical elements at intervals not more than 18 times the wall thickness, in addition to support at the top of the wall, the depth below grade may be one foot more than indicated in Table 53-IXA.

b. Pilasters providing lateral support shall have a width not less than 16 inches and shall project from the face of the wall not less than 1/12 the wall height. All cells of hollow units shall be filled with grout.

3. Where the height of wall or depth below grade exceeds the values indicated in Table 53-IXA, or if the wall is not laterally supported at the top, the foundation wall shall be designed in accordance with the provisions of s. COMM 53.323 for engineered masonry.

4. When a foundation wall contains an opening more than 4 feet in width or contains openings in more than 25% of its length, the design of the wall shall be based upon an engineering analysis.

TABLE 53-IX A
MAXIMUM HEIGHT OF WALL AND DEPTH BELOW GRADE FOR MASONRY FOUNDATION WALLS [1,2]

Foundation Wall Construction Type of Unit and Nominal Thickness (Inches)		Maximum Wall Height[3] (Feet)	Maximum Depth Below Grade[4] (Feet)	
			Granular Backfill with Subsurface Drainage[5]	Clay or Silt Backfill with Subsurface Drainage[5]
Hollow Masonry	8	7	5	4 1/2
	10	8	6	5 1/2
	12	8	7	7
Solid Masonry	8	8	5 1/2	5
	10	8	6 1/2	6
	12	8	7	7

[1] Where lateral support is provided by vertical elements, see s. COMM 53.322 (2)(e) 2.

[2] The depth below grade and height of wall may exceed the values indicated if the design is based upon an engineering analysis.

[3] Clear height between floors providing lateral support.

[4] The depth below grade is determined by the height of finished grade above the basement floor or inside grade. Where exterior grade adjacent to the foundation wall is surcharged within a distance equal to the maximum depth permitted, the depth of wall shall be reduced accordingly.

[5] Walls shall be provided with subsurface drainage.

(3) LATERAL SUPPORT.

(a) *Requirements.* All masonry shall be laterally supported in conformance with the following:

1. Exterior walls. Exterior masonry walls, whether they be load-bearing or nonload-bearing, shall be laterally supported either horizontally or vertically at intervals not exceeding those indicated in Table 53-X.

TABLE 53-X
MAXIMUM RATIO OF LATERALLY UNSUPPORTED HEIGHT OR LENGTH TO THICKNESS FOR ALL EXTERIOR WALLS

Type of Masonry	Mortar Type			
	M	S	N	O
Single wythe walls of solid units or grouted walls of solid units	22	22	20	18
Slushed or parged walls of solid units	20	20	18	16
Hollow walls† or walls containing hollow units	18	18	16	12

† In computing the ratio for hollow walls, the value for thickness shall be the sum of the nominal thickness of the inner and outer wythes.

2. Load-bearing interior walls. Load-bearing interior walls shall have lateral supports at either vertical or horizontal intervals not exceeding 24 times the wall thickness for solid masonry units and 20 times the wall thickness for hollow masonry units.

3. Nonload-bearing interior walls (partitions). Nonload-bearing partitions shall have lateral supports at either vertical or horizontal intervals not exceeding 30 times the thickness of the wall.

4. Special masonry walls.

a. The height of an exterior free standing masonry wall having no lateral support at the top or at the ends may not exceed 4 times the thickness of the wall.

Note: See s. COMM 53.322 (2) (cm) 2. for parapet walls.

b. The height of a free standing interior wall may not exceed 9 times the thickness of the wall.

(b) *Methods of lateral support.*

1. General. Lateral support shall be provided by cross walls, pilasters or vertical structural members of sufficient strength to provide the required support when the limiting distance is measured horizontally; and/or by floors, roofs or horizontal structural elements which are of sufficient strength to provide the required support when the limiting distance is measured vertically. Provisions shall be made to transfer all lateral forces to the foundation.

2. Limitations. When horizontal structural elements are depended upon for lateral support, lateral support by vertical elements shall also be provided at intervals of not more than 72 times the wall thickness.

Lateral support. *Empirically designed masonry must be laterally supported in accordance with this section. The intervals for lateral support of exterior walls are given in Table 53-X and vary depending on the type of masonry unit and mortar used.*

Lateral support may be provided at either horizontal or vertical intervals. Vertical lateral support may be provided by cross wall (wood stud walls are not acceptable), pilasters or vertical structural members of sufficient strength. Horizontal lateral support may be provided by floor, roofs, or horizontal structural members of sufficient strength. If horizontal lateral support is provided to

meet Table 53-X, vertical lateral support must also be provided at a spacing not more than 72 times the wall thickness. If pilasters are used for lateral support, the code specifies the minimum size of the pilasters. Requirements for pilasters providing lateral support for walls below grade are specified in COMM 53.322 (2)(e) 2.

(c) *Pilasters.* A pilaster is a reinforced or nonreinforced masonry section which is thicker than and integrally bonded or mechanically keyed to the adjoining wall by alternate course bonding of masonry or by the use of pilaster blocks. A mechanically keyed control joint will be permitted on only one side of a pilaster which is used to provide lateral support. The projecting portion of the pilaster shall be bonded to the wall portion of the pilaster by lapping at least 50% of the units at the intersection or using special pilaster units.

1. All pilasters relied upon to provide lateral support shall not be less than 4 inches thicker than the wall supported nor less than 1/12 times the pilaster height. The width of pilasters shall be not less than 16 inches.

2. Where a pilaster is needed to carry a concentrated load from a flexural element, the least dimension shall be not less than 1/40 of the span of such an element and the height of the pilaster shall not exceed 12 times the least dimension of the pilaster. All voids, within and between masonry units, shall be fully grouted.

Note: The intent of this rule is to permit the empirical method of design for masonry pilasters carrying concentrated loads provided the pilaster details eliminate the eccentricity and provided the actual stresses are less than or equal to the allowable stresses. Pilasters may also be designed through engineering analysis in accordance with s. COMM 53.323.

(d) *Piers.* A pier is an isolated column of masonry. A load-bearing wall not bonded at the sides into associated masonry shall be considered a pier when its horizontal dimension measured at right angles to the thickness does not exceed 4 times its thickness.

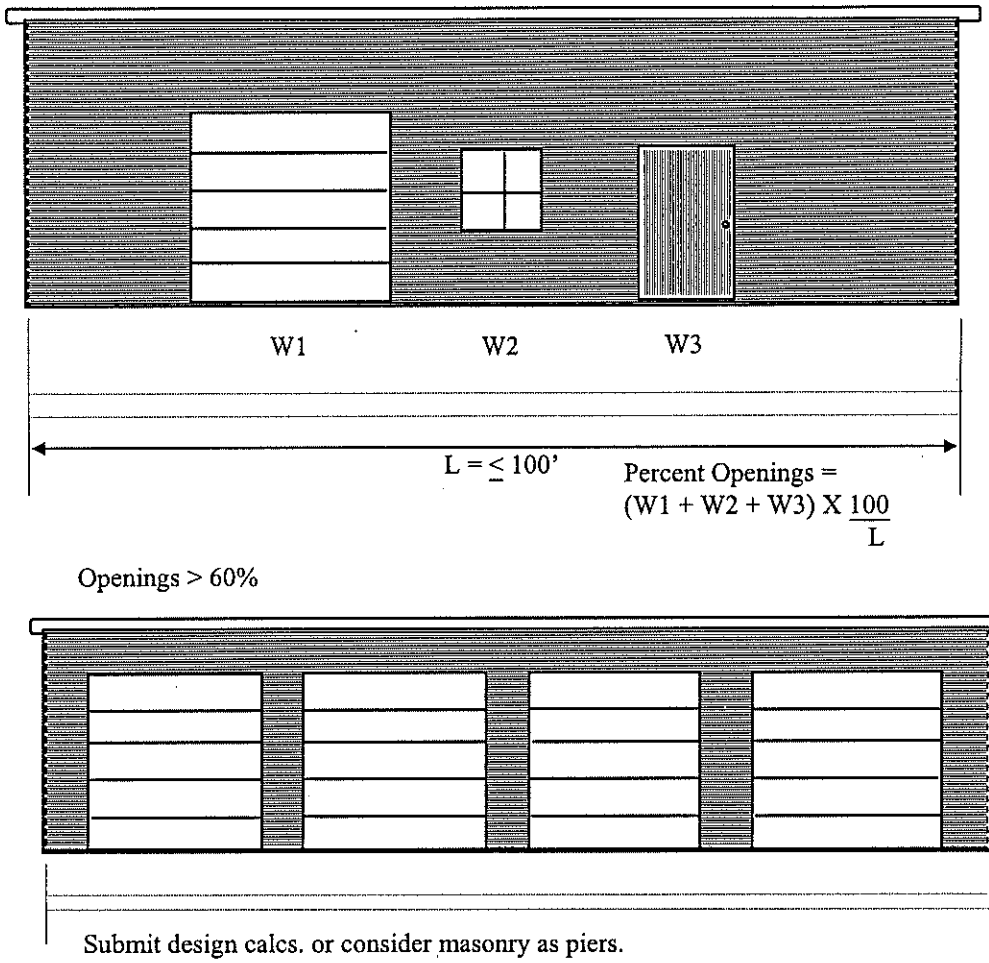
1. All piers shall have lateral supports so that the vertical distance between such supports does not exceed 10 times their least dimension for single wythe or grouted masonry walls of solid masonry units, 8 times their least dimension for slushed or parged masonry walls of solid masonry units, and 6 times their least dimension for other masonry.

2. The least dimension of piers carrying flexural members shall be not less than 1/30 of the span of the flexural members.

3. Piers shall be laid in running bond unless reinforced as required for stack bond walls.

(4) OPENINGS. Unless evidence is provided to show that openings do not cause lateral stability and stress requirements to be exceeded, the amount of openings in a masonry wall shall not exceed the limits set forth in Table 53-XI.

Openings. *When using the empirical method, the code limits the amount of openings in a masonry wall. The code allows 20% openings with no increase in lateral support required. Between 20% and 60% openings, the code requires additional lateral support in accordance with Table 53-XI. If a wall has more than 60% openings, the engineered method must be used. In many cases, garages and loading docks have more than 60% openings in any 100 lineal feet of wall and, therefore, calculations must be submitted. An exception would be where the isolated portion of masonry conforms to requirements of subsection (d) for piers. (See diagram.)*



EXTERIOR MASONRY WALLS (with openings)
LATERAL SUPPORT
COMM 53.322 (4)

TABLE 53-XI
MAXIMUM RATIO OF LATERALLY UNSUPPORTED HEIGHT OR LENGTH TO THICKNESS FOR EXTERIOR WALLS WITH OPENINGS†

Type of Masonry	Percent of Openings at any Horizontal Plane of Wall			
	20	40	60	Over 60
Single wythe walls of solid or grouted walls of solid units	20	16	12	Submit Design
All other masonry	18	14	10	Calculations

†The percentage of openings shall be calculated for each 100 lineal feet of wall or portion thereof at any horizontal plane of wall. See Table 53-X for additional restrictions when type "N" or "O" mortar is used.

(5) BONDING.

(a) *General.* All types of masonry shall be adequately bonded.

(b) *Longitudinal bond.*

1. Running bond. In each wythe of masonry, not less than 60% of the units in any transverse vertical plane shall lap the ends of units above and below a distance not less than 2 inches or 1/3 the height of the unit, whichever is greater. Masonry not lapped as required above will be considered as stack bond and shall be reinforced longitudinally as required in 2. below for masonry units laid in stack bond.

Bonding - Longitudinal bond. *Single wythe exterior walls with masonry units laid in running bond require continuous tie assemblies at a vertical spacing not exceeding 24 inches. Running bond means that at least 60% of the units are lapped with the units above and below at least 2 inches but at least one-third the height of the unit. The tie assemblies need not be provided if control joints are provided at a spacing of 80% of the values specified in s. COMM 53.322 (7) or if they are provided at 20 feet spacing or less. Masonry units laid in stack bond require continuous tie assemblies at a vertical spacing not exceeding 16 inches, except for interior nonload-bearing partitions where a spacing of 24 inches is allowed.*

2. Stack bond. In each wythe of masonry with units laid in stack bond, the masonry shall be reinforced by a continuous tie assembly, as defined in s. COMM 53.316 (2), at vertical intervals not exceeding 16 inches. For interior nonload-bearing partitions this spacing may be increased to 24 inches. (For load-bearing walls, see also s. COMM 53.34 (3)(b) 4.)

3. Single wythe exterior concrete masonry walls. Where units are laid in running bond, such masonry wall shall be reinforced by a continuous tie assembly, as defined in s. COMM 53.316 (2), at vertical intervals not exceeding 24 inches. The requirement for tie assemblies is waived when the spacing of control joints is reduced to 80% of the values indicated in Table 53-XII, or if the spacing between control joints is 20 feet or less.

(c) *Transverse bond.* In multi-wythe masonry, adjacent wythes shall be bonded with either metal ties or headers in accordance with the following:

1. Bonding with metal ties. Adjacent wythes of masonry shall be bonded by embedment of reinforcement in the horizontal mortar joints with one of the following methods:

a. Continuous tie assemblies, as defined in s. COMM 53.316 (2), spaced at vertical intervals not exceeding 16 inches.

b. Individual ties, the equivalent of not less than 3/16 inch diameter steel rods, with one tie for not more than each 4 1/2 square feet of wall area. Ties in alternate courses shall be staggered. The maximum vertical distance shall not exceed 18 inches. The maximum horizontal distance shall not exceed 36 inches. Ties bent to rectangular shape shall be used with hollow masonry units. With solid masonry units, either rectangular ties or ties bent to 90° angles, Z shaped, to provide hooks not less than 2 inches long shall be used. In hollow walls, additional ties shall be provided at all openings, spaced not more than 3 feet apart around the perimeter and within 12 inches of the opening. Corrugated metal ties shall not be used.

Transverse bond. *Multi-wythe masonry may be bonded with either metal ties or headers. Metal ties may be either continuous ties spaced not more than 16 inches vertically or individual ties, with one tie for each 4 1/2 square feet of wall. Corrugated metal ties cannot be used. Full course headers may be used to bond multi-wythe masonry only if the space between the wythes is filled with mortar or grout. The header course must overlap both wythes at least 3 inches and is to be provided at least every seventh course, but the clear distance between header courses cannot exceed 16 inches for solid units and 24 inches for hollow units. Bonding with headers is not permitted for cavity walls.*

2. Bonding with masonry bond units (headers).

a. Adjacent wythes of masonry shall be bonded by the equivalent of a full header course overlapping both wythes at least 3 inches and spaced at intervals not greater than every seventh course. The clear distance between bond courses shall not exceed 16 inches for solid units and 24 inches for hollow units. One-seventh of the wall surface shall be header or bond units.

b. In ashlar masonry, bond stones uniformly distributed shall be provided to the extent of not less than 10% of the area of exposed faces.

c. Rubble stone masonry shall have not less than one bond stone for each 6 square feet of wall surface on both sides. Such walls, 24 inches or less in thickness, shall have bond stones with a maximum spacing of 3 feet vertically and 3 feet horizontally.

d. Hollow walls shall not be bonded with headers.

Note: For definition of hollow walls, see s. COMM 53.321 (4)(c).

3. Interrupted bond. Where a structural member interrupts a backing wythe such that transverse bond otherwise required cannot be achieved, the facing wythe shall be bonded to that structural member as in subd. 1.

(d) *Bond at intersections and corners.* Masonry that changes direction, or meets or intersects other masonry, where dependent for lateral support, shall be bonded by one of the following methods:

1. Walls laid separately. Provide joints with not less than the following:

a. For load-bearing elements, the equivalent of 1 1/4 inch by 1/4 inch anchors with ends turned up not less than 2 inches and not less than 24 inches between turned ends, embedded equally into each adjacent wall and spaced not more than 2 feet vertically. Where there is not sufficient thickness of masonry to embed such anchors properly, equivalent anchorage shall be provided by cross pins or other means.

b. For nonload-bearing elements, the equivalent of 7/8 inch by 22 U. S. gage anchors, 8 inches or more in length, embedded equally into each adjacent wall and spaced not more than 16 inches vertically.

c. When regularly toothed or blocked, the vertical spacing of anchors required above may be doubled.

2. Walls laid simultaneously. Provide joints satisfying one of the following:

a. Lap at least 50% of the units at the intersection.

b. Use details which are designed to permit differential movement at the intersection of interior and exterior masonry, provided such details are consistent with the requirements for lateral stability of the masonry.

(6) ANCHORAGE.

(a) *General.* All masonry dependent upon structural elements for continuity or lateral support except as specified in s. COMM 53.63 (3) shall be securely anchored thereto in such a manner as to resist all forces, especially wind and all lateral forces acting either inward or outward.

Anchorage. *See COMM 53.316 Anchorage also. Masonry which depends on structural elements for continuity or lateral support must be anchored to the structural elements in accordance with this section. Concrete floor systems used to provide lateral support for load-bearing masonry need not be anchored if there is concrete to masonry contact. Other floor systems must be securely anchored except that fire cut wood members should be free to rotate out of the wall. Methods for anchoring floor systems are not specified. Roof systems used to provide lateral support for load-bearing masonry must be anchored with 1/2 inch diameter bolts no more than 6 feet spacing or equivalent. The bolts must be anchored in the masonry either by extending the bolts 12 inches into the masonry with a 6-square-inch steel plate attached to the head or embedding the bolts 6 inches into a continuous bond beam and hooking the bolt under the longitudinal reinforcement in the bond beam. Exterior nonload-bearing masonry utilizing structural framework for lateral support must be anchored to the framework on two opposite sides by one 1/8-inch by 1-inch anchor or equivalent, embedded 8 inches into the masonry for 18 square feet of wall surface. Wedging is not acceptable.*

(b) *Load-bearing masonry.*

1. Floor anchorage.

a. All types of concrete floor systems which bear continuously on masonry with concrete to masonry contact may be considered to provide adequate lateral support.

b. All other structural elements intended to provide lateral support shall be securely anchored to the masonry.

2. Roof anchorage. Roof structures shall be securely anchored to load-bearing masonry with the equivalent of at least 1/2-inch diameter bolts spaced not more than 6 feet on center and embedded in the masonry according to one of the following methods:

a. A steel plate having a minimum surface area of 6 square inches securely attached to the head of each bolt and completely embedded in the masonry at least 12 inches.

b. A continuous bond beam the equivalent of not less than 8-inch lintel (bond beam) blocks with 2 continuous No. 4 bars embedded in 2,500 psi concrete fill provided at the top of the masonry. The bolts shall be embedded at least 6 inches and hook beneath the longitudinal reinforcement.

(c) *Exterior nonload-bearing masonry.*

1. Anchorage of masonry to the structural framework. Where masonry is dependent upon the structural framework for lateral support or transmission of lateral loads, the masonry shall be anchored to the framework on at least 2 opposite sides of the perimeter of the wall, with the equivalent of a one-inch wide by 1/8-inch thick anchor for each 18 square feet of wall surface, embedded at least 8 inches into the masonry, and spaced not more than 36 inches on center. Wedging will not be considered as an equivalent method.

2. Anchorage of panel walls suspended from the structural framework. Exterior prefabricated masonry assemblages and other elements, larger than conventional size masonry units shall be anchored to their weight supports with the equivalent of 5/8 inch minimum diameter stainless steel bolts or 3/4 inch minimum diameter corrosion resistant plated steel bolts.

(d) *Interior nonload-bearing masonry.* Where masonry is dependent upon the structural framework for lateral support, such masonry shall be anchored with the equivalent of a flexible 3/16 inch diameter anchor for each 12 square feet of wall surface, embedded at least 4 inches into the masonry, and spaced not more than 48 inches on center. Wedging may be used to anchor the top of a masonry partition to its top horizontal support.

(7) JOINTING. Joints commensurate with lateral stability requirements shall be installed in all exterior masonry to allow for expected growth of clay products and shrinkage of concrete products.

(a) *Vertical jointing.* Vertical control joints shall be provided at a spacing in compliance with Table 53-XII.

Jointing. *Vertical control joints must be provided. Maximum spacing of vertical joints is specified in Table 53-XII with maximums dependent on the type of units, percent openings in the wall and where the space is joint-to-joint or joint-to-corner. Since cracking will occur if joints are not provided, the intent is to control the cracking. Some minor cracking will probably occur even with the joints. Joints should be provided at changes in building height, changes in framing systems, columns built into exterior walls, major wall openings and changes in material.*

TABLE 53-XII
MAXIMUM SPACING OF EXTERIOR MASONRY CONTROL JOINTS BETWEEN UNRESTRAINED ENDS[†] (FEET)

Loading Conditions	Type of Material	Openings (Percent of total Wall Area)			
		0 to 20		More than 20	
		Joint to Joint	Joint to Corner	Joint to Joint	Joint to Corner
Load-bearing	Clay units	140	70	100	50
	Concrete units	60	30	40	20
Nonload-bearing walls	Clay units	100	50	60	40
	Concrete units	50	25	30	20

[†]Jointing required is a minimum and is not intended to prevent minor cracking. The distances given for maximum spacing of joints are for a single wall plane. For composite walls, the maximum spacing of joints shall be governed by the masonry material type used in the exterior wythe.

Note: To accomplish the intended purpose, joints should be located at critical locations such as (but not limited to) changes in building heights, changes in framing systems, columns built into exterior walls, major wall openings and changes in materials.

(b) *Horizontal jointing.* Where supports such as shelf angles or plates are required to carry the weight of masonry above the foundation level [see ss. COMM 53.322 (2)(a) and 53.36 (4)(b)], a pressure-relieving joint shall be provided between the structural support and any masonry which occurs below this level. The joint width shall be such as to prevent any load being transmitted from the support to any element directly below. All mortar and rigid

materials shall be kept out of this joint. This type of joint shall be provided at all such supports in a concrete frame structure where clay masonry is exposed to the weather.

COMM 53.323 ENGINEERED MASONRY.

(1) DEFINITION. Engineered masonry means design of plain or reinforced masonry based on an engineering analysis.

MASONRY - ENGINEERED METHOD

Calculations. *The department will accept calculations in accordance with the "Building Code Requirements for Engineered Brick Masonry" of the Brick Institute of America for clay and shale units and the "Specifications for the Design and Construction of Load-Bearing Concrete Masonry" of the National Concrete Masonry Association (NCMA) and "Building Code Requirements for Concrete Masonry Structures" (ACI-531-79) of the American Concrete Institute (ACI) for concrete units and Building Code Requirements for masonry structures (ACI 530-88/ASCE 5-88) and specifications for masonry structures (ACI 530.1-88/ASCE 6-88).*

Variations from empirical method. *Examples of differences between engineered masonry and masonry designed using the empirical method are:*

a. Tensile stresses are allowed in engineered masonry, not allowed empirical method.

b. Stresses are computed on net section for engineered masonry, gross section under empirical method.

c. For cavity walls, effective thickness equals two-thirds of the sum of the wythes for engineered masonry, equals the sum of the wythes under empirical method.

d. Spacing between control joints is not specified for engineered masonry. It is recommended that joints be provided such that the ratio of the control joints spacing to wall height should not exceed 4 or the spacing should not exceed 100 feet. Spacing of control joints is specified in Table 53-XII under the empirical method.

(2) REQUIREMENTS. Calculations or other substantiating data to justify a reduction in requirements shall be submitted for all items in conflict with s. COMM 53.322, 53.33 or 53.34.

Note: It will be the practice of the department to approve designs in conformance with the following: (1) clay and shale units--"Building Code Requirements for Engineered Brick Masonry." Structural Clay Products Institute (now known as Brick Institute of America), 1750 Old Meadow Road, McLean, Virginia 22101 (August 1969); (2) concrete units--"Specifications for the Design and Construction of Load-Bearing Concrete Masonry," National Concrete Masonry Association, P.O. Box 9185, Rosslyn Station, Arlington, Virginia 22209 (1970); (3) cast stone and architectural precast concrete units--"Design of Precast Concrete Wall Panels," Title No. 68-46, ACI Journal, July 1971 (also see s. COMM 53.40); (4) "Building Code Requirements for Masonry Structures, ACI 530.88/ASCE 5-88; (5) "Specifications for Masonry Structures, ACI 530.1-88/ASCE 6-88; and (6) standards of accepted engineering practice, provided proposed materials are in successful similar use or proven by test to be adequate.

(3) LIMITATIONS. Where design by engineering analysis is based upon material of a higher grade or a superior workmanship than is generally provided in accepted practice, it must be clearly established to the satisfaction of the department by test or other evidence that such quality exists and will only be employed under special inspection or field testing.

COMM 53.33 CONSTRUCTION.

(1) COLD WEATHER WORK. Adequate cold weather construction and protection provisions shall be taken to prevent masonry from being damaged by freezing.

Note: It will be the practice of the department to accept conformance with "Recommended Practices for Cold Weather Masonry Construction," International Masonry Industry All-Weather Council, 1970. (Available from International Masonry Institute, 823 15th Street NW, Washington, D.C. 20005.)

(2) LOAD-BEARING MASONRY.

(a) The maximum thickness of a mortar joint shall be 1/2 inch.

(b) Except for head joints used for weep holes and ventilation, solid masonry units shall be laid so as to achieve full head and bed joints.

(c) Hollow masonry units shall be laid with full head joints and full bed joints under the full bearing areas of the face shells (and under webs where the adjacent cells are to be filled with grout).

(3) CLEANING. Chemical cleaning agents shall be prevented from harming the metal reinforcement of structural components.

COMM 53.34 MISCELLANEOUS DESIGN-CONSTRUCTION DETAILS.

(1) SPECIAL USE WALLS.

(a) *Hollow walls.*

1. In exterior hollow walls, suitable flashing shall be installed at the bottom of the cavity so as to drain any water outward.

2. Open vertical joints or weep holes of 3/8 inch minimum diameter shall be provided in the facing just above the flashing at a horizontal spacing not exceeding 3 feet.

(b) *Retaining walls.* The tops of exposed retaining walls shall be coped with noncombustible weatherproof material.

(c) *Reuse of existing walls.* Existing masonry may be used in the alteration or extension of a structure, provided that under the new conditions imposed it meets the requirements of this code or is made so by reasonable repairs.

Note 1: See s. COMM 51.02 (12) for requirements of parapet walls.

Note 2: See s. COMM 53.11 (4)(e) 2. for requirements for scuppers or relief openings.

(2) CHANGES IN THICKNESS OR PLANE.

(a) *Nonvertical planes.* Details and techniques for all masonry to be installed in a nonvertical plane shall be submitted to the department for approval.

(b) *Thickness change requirements.* Where hollow walls or walls of hollow masonry units change in thickness, a course of solid masonry, concrete-filled hollow units or a continuous bearing element shall be interposed between the thicker and thinner sections.

(c) *Increase in thickness, including corbels.* The thickness of masonry shall not be increased (in the upward direction), except for corbels as follows:

1. The maximum horizontal projection of a corbel from the face of the wall from which it projects shall not exceed 1/3 the thickness of the wall.

2. The maximum projection of a masonry unit shall not exceed 1/2 the height of the unit nor 1/3 its bed depth.

(d) *Variation in thickness (chases and recesses).* Walls shall not be less than their required thickness between horizontal lateral supports except where permitted for chases and recesses as follows:

1. Chases or recesses shall not be made in load-bearing walls 8 inches or less in thickness. Pipes, ducts, conduits or similar noncombustible items may be installed in cores of hollow units.

2. Chases or recesses shall not be closer than 2 feet to any pilaster, buttress, cross wall, end wall or other stiffener that provides lateral support.

3. The maximum depth of any chase or recess shall not exceed 1/3 the thickness of the wall.

4. The length along the wall of any chase or recess shall not exceed 4 feet.

5. The clear distance between chases and recesses or each other shall not be less than 4 times the wall thickness.

6. Any chase or recess in conflict with the previous requirements shall be considered as an opening (see s. COMM 53.34 (3)(a) 4.).

7. No chase or recess shall reduce the thickness of material below the minimum required for fire walls, fire division, fire partitions or fire protective covering of structural members.

(e) *Protection.* In masonry exposed to the weather, pockets or crevices in which water may accumulate shall be avoided or protected to prevent damage.

(3) BEARING.

(a) *Weight support of masonry.*

1. General requirements. The bearing support for all masonry shall be of noncombustible material and have lateral stability.

Miscellaneous details. *Bearing details generally require concrete, solid masonry or metal plates to distribute loads so that the bearing stresses will not exceed allowable compressive stresses specified in Table 53-IX. Special attention should be given to eccentric loads that may result in local bearing failures or produce tension in the masonry.*

2. Projections. The projection of a wall beyond the edge of a supporting member other than masonry, such as a shelf angle or edge of a beam, shall not exceed 1 1/4 inches, unless at least 2/3 the mass of the wythe of masonry involved is located directly over the load-carrying member.

3. Shelf angles. See s. COMM 53.322 (7)(b).

4. Openings. The masonry above openings shall be adequately supported. The bearing length of structural elements which support the masonry above the opening shall be not less than 4 inches. The bearing stresses at these locations shall not exceed those allowed in s. COMM 53.322 (1).

(b) *Bearing on masonry.* Bearing stresses in masonry shall not exceed those specified in Table 53-IX. Flexural members shall have bearing details that allow rotation at their supports without causing local failures.

1. Concentrated loads. Beams, girders, trusses, joists and other members causing concentrated loads shall bear a minimum of 3 inches in length in the direction of span upon at least one of the following:

a. Concrete beam. The equivalent of a nominally reinforced 2,500 psi concrete beam 8 inches in height.

b. Solid masonry. At least 8 inches in height of masonry composed of solid masonry units with all voids and joints completely filled with mortar.

c. Metal plate. A metal plate of sufficient thickness and size to safely distribute the load to masonry units. For piers and columns, the bearing plate shall not exceed 60% of the cross-sectional area of the pier or column and the resultant reaction of all vertical and horizontal loads shall fall within the middle third of the member.

d. Bond beam. The bond beam shall be the equivalent of not less than 8-inch lintel (bond beam) blocks with 2 No. 4 bars embedded in 2,500 psi concrete fill. The loads shall bear on the concrete fill.

2. Continuous loads. Joists, trusses and beams other than wood for wood, [see s. COMM 53.63 (4)], spaced 4 feet or less on center and 40 feet in span, slabs or other members causing continuous loads shall be transmitted to masonry with a minimum bearing length of 3 inches upon solid masonry at least 2 1/2 inches in height, or as indicated for concentrated loads.

3. Multi-wythe walls. Ties required for transverse bond shall be installed in the first horizontal mortar joint below the required beam, solid masonry or metal plate.

4. Stack bond walls. Concentrated loads shall be distributed into masonry laid in stack bond by a concrete beam or bond beam (as defined in subd. 1.). For masonry of solid units, 2 additional rows of a continuous tie assembly [as defined in s. COMM 53.316 (2)] may be used instead of a concrete beam or bond beam.

5. Support of wood floor members.

a. Where a wood structural member is buried in masonry for support, it shall be firecut or a self-releasing device shall be used.

b. Where the end of a wood structural member is built into an exterior wall, a 1/2-inch air space shall be provided at the sides, top and end of such member.

(4) JOINTING. See s. COMM 53.322 (7) for jointing.

(5) BOLTS AND ANCHORS. The allowable shear on steel bolts and anchors shall not exceed the values given in Table 53-XIII.

Bolts and anchors. *The allowable loads specified are valid only for bolts or anchors solidly embedded in mortar or grout, with the applied load acting in shear at the face of the masonry. Other anchor devices may require submittal of test data or analysis based on properties of the masonry material.*

TABLE 53-XIII
ALLOWABLE SHEAR ON BOLTS AND ANCHORS

Bolt or Anchor Diameter (Inches)	Embedment† (Inches)	Allowable Shear (Pounds)
1/4	4	270
3/8	4	410
1/2	4	550
5/8	4	750
3/4	5	1100
7/8	6	1500

1	7	1850
1 1/8	8	2250

†Bolts and anchors shall be solidly embedded in mortar or grout.

COMM 53.35 TESTS.

(1) GENERAL. All masonry materials shall meet the requirements of s. COMM 53.31, and the department may require submittal of test data, at any time, to show conformity.

(2) SAMPLING AND TESTING. The selection and construction of all test specimens shall conform to standard test procedures and shall be truly representative of the materials, workmanship and details to be normally applied in practice.

(3) STANDARDS. The testing of all masonry shall be in accordance with Table 53-XIV.

(4) SPECIAL TESTS.

(a) *Fire tests.* See s. COMM 51.04.

(b) *Load tests.* Whenever there is reasonable doubt as to the stability or structural safety of a completed structure or part thereof, the department may require a load test on the building or portion of the structure in question.

TABLE 53-XIV
STANDARD METHODS OF SAMPLING AND TESTING

Classification	Item	ASTM Test Method Standard
Base Materials	Portland Cement	C 150
	Masonry Cement	C 91
	Hydrated Lime	C 25, C 50, C 110
	Gypsum	C 471, C 472
Mortar	Aggregate	C 144
	Mortar	C 270a
Masonry Units	Clay and Shale	C 67. C 122
	Concrete	C 140
	Natural Stone	C 97, C 99, C 170, C 666
	Cast Stone	C 42, C 97
	Arch. Precast Concrete	C 39, C 42, C 97, C 457
	Gypsum	C 473
Assemblies		E 72, E 149, E 447

[a]Mortar in the field, tested in a laboratory, shall test at least 85% of the minimum compressive strength required, and the field mortar will serve as the final basis for mortar approval. When mortar is not proportioned according to limitations of Table 53-VII, mortar shall be periodically tested by an impartial testing laboratory. Results of such required testing shall be submitted as evidence of conformity, when requested by the department.

COMM 53.36 VENEER, FURRING AND TRIM.

(1) GENERAL. Veneer, furring and trim as used in this section refers to a facing of weather-resistant noncombustible materials securely attached to a backing, but not so bonded as to exert common action under load.

(a) Veneer shall not be considered as part of the masonry when computing strength or required thickness.

(b) Veneer shall not be assumed as supporting any load other than its own weight.

(2) MATERIAL REQUIREMENTS.

(a) *General.* See s. COMM 53.31 for typical requirements of common masonry materials.

(b) *Tile and terra-cotta.* Such units shall be frost-proof and not more than 288 square inches in area.

(3) THICKNESS. No materials used for veneer shall have a thickness less than the values listed in Table 53-XV.

(4) BEARING AND BACKING SUPPORTS.

(a) Bearing and backing supports shall be weather-resistant and shall provide sufficient strength and stability to adequately support the veneer.

Bearing and backing support. *The bearing or weight support for masonry veneer is required to be of noncombustible material for conformance with COMM 53.34 (3)(a). Masonry veneer may be constructed to a height of 30 feet without providing additional weight supports. Shelf angles or other weight supports are required at vertical spacing of 18 feet above the 30-foot height. A pressure relieving joint is required below shelf angles as specified in COMM 53.36 (6) and 53.322 (7)(b).*

TABLE 53-XV
MINIMUM THICKNESS OF VENEERS

Material	Minimum Actual Thickness (Inches)
Clay Brick or Tile	1 5/8
Concrete Masonry Units	1 5/8
Natural Stone	1 5/8
Cast Stone	1 1/2
Architectural Precast Concrete	5/8
Marble Slabs	7/8
Slate	7/8
Architectural Terra-Cotta	1
Ceramic Veneer—Mechanical Anchorage	1
Ceramic Veneer—Adhesion Anchorage	3/16
Asbestos Cement Boards	1/8
Aluminum clapboard Siding	.024
Metal—Corrosion Resistant	.0149
Stucco and Exterior Plaster	3/4

(b) Masonry veneer 1 5/8 inches or greater in thickness shall be supported by shelf angles or other equivalent weight supports. The spacing between such supports shall not exceed 18 feet vertically when the veneer is more than 30 feet above grade.

(5) ATTACHMENT.

(a) *General.* All veneers, supports and attachments shall be capable of resisting a horizontal force equal to the wind loads specified in s. COMM 53.12. Attachment shall be accomplished by mechanical methods or adhesion.

(b) *Attachment by mechanical methods.* All anchors shall be corrosion-resistant.

1. Veneer of conventional size masonry units (one square foot or less). Such veneer shall be securely attached to its backing by anchors the equivalent of 22 U.S. gage corrugated sheet steel 7/8 inch wide with at least one such tie located in every 2 square feet of wall.

2. Veneer of large size masonry units (greater than one square foot). Such veneer shall be securely attached with anchors the equivalent of not less than 1/4 inch diameter bolts in accordance with either of the following:

a. Each unit individually anchored to the supporting framework with at least 3 anchors.

b. Individual units doweled to each other at all horizontal joints and anchored to the backing at all horizontal and vertical joints so that one anchor is provided for every 6 square feet of wall surface.

3. Veneer of metal. Exterior metal veneer shall be securely attached to its backing or supporting framework with the equivalent of wire of at least No. 9 steel wire gage spaced not more than 24 inches apart both horizontally and vertically. Wider spacing where proved adequate may be used when units exceed 4 square feet in area, provided there are at least 4 proper attachments per unit.

(c) *Attachment by adhesion.* Veneer one inch or less in thickness may be cemented to a masonry or concrete wall or to exterior portland cement plaster on high rib galvanized metal lath with an adhesive, provided that the bond is sufficient to withstand a shearing stress of 50 psi after curing for 28 days. Individual units so attached shall not exceed 30 inches in any one dimension nor have more than 540 square inches of face area.

(6) JOINTING. Pressure-relieving joints commensurate with lateral stability requirements shall be provided both horizontally and vertically where needed to compensate for differential movement between veneer and backing or frame. See also s. COMM 53.322 (7).

(7) GROUNDING. Metal veneers fastened to supporting elements which are not a part of the grounded metal framing of a building shall be effectively grounded.

Subchapter IV — Concrete

COMM 53.40 CONCRETE REQUIREMENTS.

The design and construction of structures in concrete of cast-in-place or precast construction shall conform to ACI 318-89 or ACI 318.1-89.

COMM 53.41 GYPSUM CONCRETE REQUIREMENTS.

(1) GENERAL. The design and construction of gypsum concrete shall be in accordance with ASTM C-317 or C-956.

(2) LIMITATIONS. Gypsum concrete shall not be used where exposed directly to weather or where subject to wetting. Gypsum concrete shall be protected from freezing or coming in contact with moisture during shipment, storage, erection or pouring.

COMM 53.42 VERMICULITE CONCRETE REQUIREMENTS.

Subchapter V — Metals

COMM 53.50 STRUCTURAL STEEL REQUIREMENTS.

The design, fabrication and erection of structural steel for buildings and structures shall conform to: AISC, "Specification for Design, Fabrication and Erection of Structural Steel for Buildings," and the provisions of the accompanying commentary for this specification, with the following modifications:

Question: *What is the appropriate design manual to use for tower design?*

Answer: *EIA Standards 222-C or D as accepted under COMM 62.37 and Official Code Interpretation.*

(1) FABRICATOR SPLICES. Any shop or field connection or splice not specifically shown on the designer's drawings shall have been previously approved by the designer and a record shall be kept of this approval. This record shall be submitted to the department when requested.

(2) LATERAL BRACING MEMBERS.

(a) Individual bracing members providing lateral restraint to columns or to compression flanges of beams and girders or to compression chords of trusses shall be proportioned to resist at least 2% of the compression force in the element braced unless a suitable analysis is made to determine the appropriate strength and stiffness of the bracing member.

(b) An analysis shall be conducted when bracing forces larger than 2% of the compression force are encountered in lateral bracing members, such as angles, channels and zee sections.

Bearing stiffeners. *AISC requires bearing stiffeners for beams at end reactions and interior loads unless shown by structural calculations that they are not needed. This condition occurs typically at interior supports of continuous beams. Many designers are unaware that there may be a web crippling problem at these locations and omit the bearing stiffeners.*

Note: These bracing forces may be encountered as a result of the lack of symmetry of the lateral bracing members.

(3) CERTIFICATION AND IDENTIFICATION.

(a) *Certification.* All structural steel shall have a mill report or a test report made in accordance with ASTM A-6 from the steel supplier; the reports shall include the information on the minimum yield strength and chemistry of the steel furnished. Upon request by the department, the supplier or fabricator shall furnish certified mill reports, test reports, affidavits and/or other information about the steel for the specific project.

(b) *Marking of steel.* Steel used for main components in completed members or assemblies shall be marked. This marking shall be accomplished by color coding or other means of identification as to its type or grade prior to shipment from the mill. The marking shall be continued through the fabricator's plant to the construction site. Steel which conforms to ASTM A-36 designation may be fabricated without marking.

Note: The type and grading may be indicated by the ASTM specification designation or a designation correlated to the information included on the certified mill or test report.

(c) *Acceptable steel types.* Steel of structural quality shall conform to the standards specified in section 1.4.1.1 of the AISC "Specification for the Design, Fabrication and erection of Structural Steel for Buildings." Steel types not listed in the above mentioned section of the AISC may be used if approved by the designer. An approval letter indicating conformance with pars. (a) and (b) shall be sent to the department.

COMM 53.51 COLD FORMED STEEL REQUIREMENTS.

The design of cold-formed steel for buildings and structures shall conform to the AISI "Specification for the Design of Cold-Formed Steel Structural Members," and the provisions of the accompanying commentary for this specification, with the following modifications:

(1) FABRICATOR SPLICES. See s. COMM 53.50 (1)

(2) LATERAL BRACING MEMBERS. See s. COMM 53.50 (2).

(3) CERTIFICATION. See s. COMM 53.50 (3)(a).

COMM 53.52 STEEL JOIST REQUIREMENTS.

The design, fabrication and erection of steel joists shall conform to the "Standard Specifications, Load Tables, and Weight Tables for Steel Joists and Joist Girders" adopted by the SJI.

Steel joist requirements. *The Steel Joist Institute specification standard joist designations for H, LH and DLH series are accepted on building plans with no additional information required where joists are used on simple spans with uniform loading. Other span or loading conditions require submittal of structural data. Information for the joist girders mentioned in this specification are design parameters only. Plan, calculations and fees are required for joist girder approval if the information is not given on the architectural or structural plans. Member sizes, bearing details and connection details must be included with the joist girder drawings.*

COMM 53.53 STRUCTURAL WELDING OF STEEL.

The requirements of this section shall apply to all welds on or between materials within the scope of ss. COMM 53.50, 53.51 and 53.52.

(1) BASE METALS. Steels to be welded under this code are listed in AWS D 1.1, sections 8.2 and 10.2 or AWS D 1.3., section 1.2.1.

(2) FILLER METALS. Filler metal requirements that are acceptable under this code are listed in AWS D 1.1 section 4.1 or AWS D 1.3., section 5.

(3) WELDING PROCESSES.

(a) Manual shielded metal arc, submerged arc, gas metal arc and flux cored arc welding processes conforming with the procedures established in AWS D 1.1, sections 2, 3 or 4 shall be considered as prequalified and are approved for use without performing procedure qualification tests.

(b) Electroslag and electrogas welding processes will not be considered as prequalified. They may be used provided a procedure is developed and provided it conforms to the applicable provisions of AWS D 1.1, sections 2, 3 or 4.

(4) WELDING PROCEDURES.

(a) *Procedure specification.* All welding procedures shall be prepared as a written procedure specification. This written procedure specification shall be prepared by the manufacturer, fabricator or contractor and shall be made available to the department or its designed testing agent prior to commencing a weld test.

(b) *Procedure qualification.* All joint welding procedures shall be previously qualified by tests as prescribed in AWS D 1.1 section 5.6, except for the prequalified procedures exempted in sub. (3) (a). The test shall be conducted by the department or its designated testing agent. The test results of a test conducted by a designated testing agent shall be submitted by the agent to the department for approval.

(5) DESIGN OF WELDED CONNECTIONS AND JOINTS. The details of all joints shall comply with the requirements of AWS D 1.1, section 2 and section 10, parts C and D or AWS D 1.3., section 3. All joint forms, except those specified in AWS D 1.1, section 2 and section 10, parts C and D, shall not be used unless qualified to the satisfaction of the department.

(a) *Stud welding.* Stud welding shall be done by a procedure qualified in accordance with the requirements of AWS D 1.1, section 4, part F.

(6) OPERATOR QUALIFICATIONS.

(a) Except as provided in (b), all structural welding work shall be performed by persons registered by the department.

Note: The rules pertaining to the registration of structural welders are specified in s. Comm 5.34.

(b) A person who holds a valid credential as a certified welder that was issued by the department prior to the effective date of these rules may continue to perform structural welding until the expiration of his or her current certification.

(8) WELD IDENTIFICATION. Each structurally significant member shall have its welding identified by a distinguishing mark stamped on the member by the registered welder or welders involved.

Question: What is the definition of a structurally significant member as referred to in COMM 53.53 (8) for weld identification?

Answer: Structurally significant member is defined as welded beams, columns, girders and main frames in buildings, and includes structural welds where failure of the weld causes a structural failure and collapse of a building primary structural system. Framing members which carry tributary loads are not necessarily structurally significant members, as a failure may cause only a localized failure. Primary structural system welds require the welder identification, whereas secondary structural members do not.

All structural welding, whether or not the welder is required to be identified, shall be done by certified welders in accordance with COMM 53.53 (6) and (7).

(9) CRITERION OF FINAL ACCEPTANCE. All structural welding is subject to examination by approved inspectors and such inspection shall be the final criterion for conformance and acceptability for the intended use.

COMM 53.54 ALUMINUM FRAMING REQUIREMENTS.

The design, fabrication and erection of aluminum structural framing members shall conform to "Specifications for Aluminum Structures," published by The Aluminum Association.

COMM 53.55 STAINLESS STEEL REQUIREMENTS.

The design, fabrication and erection of light gage stainless steel framing members shall conform to AISI, "Stainless Steel Cold-Formed Structural Design Manual."

COMM 53.56 STEEL CABLE REQUIREMENTS.

The design, fabrication and erection of steel cables for buildings shall conform to AISI "Manual for Structural Applications of Steel Cables for Buildings."

Subchapter VI — Wood and Wood Fiber Products

COMM 53.60 GENERAL.

(1) SCOPE. The requirements of ss. COMM 53.60 to 53.63, inclusive, shall apply to the materials, design, and construction procedures used in all wood and wood fiber products construction work under this code.

(2) DEFINITION. Wood and wood fiber products include those structural elements derived from solid wood, structural glued-laminated timber, plywood, fiberboard, hardboard and other wood-fiber-based materials.

Question: *There are several computer programs on the market that analyze wood structures. Are there any restrictions on which programs are acceptable?*

Answer: *No. The department will accept structural calculations run from a computer program provided the following information is submitted:*

1. *Input data*
2. *Design assumptions*
3. *Design manual and edition which engineering follows*
4. *Results in a readable format*

COMM 53.61 MATERIALS AND DESIGN OF STRUCTURAL ELEMENTS.

(1) SAWN LUMBER. The material characteristics and the design provisions of load-bearing structural sawn lumber shall be in accordance with the following adopted standard and listed exceptions:

(a) "National Design Specification for Wood Construction" and its supplement.

1. Exceptions:

a. Section 4.1.7. The provisions of this section shall also apply to reused lumber. Reused lumber shall be considered to have a duration of load factor of 0.90.

b. Section 4.2.2. In addition to requiring grading in conformance with ASTM D 245, lumber (including reused lumber) of species and grades not listed in the supplement to the NDS shall be identified by the grade mark of, or certificate of inspection issued by, a lumber grading or inspection bureau or agency recognized as being competent.

c. Section 2.2.5.3. The cumulative effects of short-time loads, such as wind, shall be considered in determining duration of load. For wind load, a duration of load factor no greater than 1.6 may be used.

(2) STRUCTURAL GLUED-LAMINATED TIMBER. Structural glued-laminated timber is an engineered, stress-rated product of a timber laminating plant comprising assemblies of specially selected and prepared wood laminations securely bonded together with adhesives. The grain of all laminations is approximately parallel longitudinally. The following standards are adopted as part of this building code for the design and production of structural glued-laminated timber, except that the modification of design stresses for duration of load shall be as specified in sub. (1)(a) 1.c.

(a) AITC 117, "Standard Specifications for Structural Glued-Laminated Timber of Softwood Species."

(b) AITC 119, "Standard Specifications for Hardwood Glued-Laminated Timber."

(3) ROUND POLES. Allowable unit stresses for nongraded round poles used as structural members other than piling shall be 80% of the allowable unit stresses for select structural grade beams and stringers (19% moisture content) of the appropriate species as listed in the supplement

to the National Design Specification for Wood Construction. No obviously unsound load-bearing poles are to be used. Higher allowable stresses will be permitted for round poles graded in accordance with a recognized standard.

Note: ASTM designation D 3200-73 "Standard Specification and Methods for Establishing Recommended Design Stresses for Round Timber Construction Poles" is acceptable for graded round poles. ANSI Standard 05.1 may be used for poles subject to transverse loads only.

(4) PILING. See s. COMM 53.24.

(5) PLYWOOD.

(a) The quality and design of all plywood used in construction of all buildings and structures shall conform to the minimum standards under this section. All plywood when used structurally, including among others, use for siding, roof and wall sheathing, subflooring, diaphragms, and built-up members, shall conform to the performance standards for its type in U.S. Product Standard PS 1 for softwood plywood/construction and industrial. Each panel or member shall be identified for grade and glue type by the trademarks of an approved testing and grading agency. In addition, all plywood when permanently exposed in outdoor applications shall be of exterior type.

Note: It will be the policy of the department to approve designs in conformance with the following: (1) "Plywood Design Specification" including Supplement No. 1 "Design of Plywood Curved Panels"; Supplement No. 2 "Design of Plywood Beams"; Supplement No. 3, "Design of Flat Plywood Stressed-Skin Panels'; and Supplement No. 4 "Design of Flat Plywood Sandwich Panels"; (2) "Plywood Diaphragm Construction"; (3) Laboratory Report 121, "Plywood Folded Plate Design and Details"; (4) Laboratory Report 93, "Load-Bearing Plywood Sandwich Panels"; and (5) "Fabrication Specifications Plywood-Lumber Components: CP-8, BB-8, SS-8, SP-61, FF-62, PW-61" (above publications available from the American Plywood Association, 1119 A Street, Tacoma, Washington 98401); (6) Design Guide HP-SG-71, "Structural Design Guide for Hardwood Plywood" (available from the Hardwood Plywood Manufacturers Association, 2310 South Walter Reed Drive, Arlington, Virginia 22206).

(b) No part of any of the above referenced standards shall supersede the general live load requirements of s. COMM 53.11.

(7) SOLID WOOD FLOOR AND ROOF SHEATHING. Minimum thickness of nonstress rated lumber used for floor and roof sheathing shall be in accordance with Table 53-XVI.

TABLE 53-XVI
MINIMUM NET THICKNESS OF LUMBER PLACED (INCHES)

		Perpendicular to Support		Diagonal to Support	
Use	Span (Inches)	Surfaced Dry†	Surfaced Unseasoned	Surface Dry†	Surface Unseasoned
Floors	24	3/4	25/32	3/4	25/32
	16	5/8	11/16	5/8	11/16
Roofs	24	5/8	11/16	3/4	25/32

† Maximum 19% Moisture Content.

(a) The above dimensions shall be the minimum dimensions for lumber with grades as specified in Table 53-XVII.

TABLE 53-XVII
MINIMUM BOARD GRADES†

Grading Agency	Solid Floor or Roof Sheathing	Spaced Roof Sheathing
West Coast Lumber Inspection Bureau	Utility	Standard
Western Wood Products Association	4 Common or Utility	3 Common or Standard
Southern Pine Inspection Bureau	No. 3	No. 2
Redwood Inspection Service	Merchantable	Construction, Common
National Lumber Grades Authority	4 Common or Utility	3 Common or Standard
Northern Hardwood and Pine Manufacturers Association	4 Common	3 Common
Northeastern Lumber Manufacturers Association	4 Common	3 Common

† The above grades are taken from grading rules approved by the American Lumber Standards Committee.

(8) TIMBER FASTENERS. The design and use of timber fasteners shall be in accordance with the requirements of National Design Specification for Wood Construction.

(a) *Fastener identification.* Light gauge perforated metal plate connectors shall be permanently identifiable with regard to their gauge and manufacturer.

(9) WOOD FOUNDATIONS AND WALLS BELOW GRADE.

(a) *Design.*

1. The design of wood foundations and walls below grade shall be in accordance with the following adopted standard and subd. 2: "All-Weather Wood Foundation System, Basic Requirements," Technical Report No. 7.

2. Exceptions:

a. Section 3.3.1. Fasteners for use in preservative treated wood shall meet the requirements of this article. Fasteners of silicon bronze or copper or stainless steel types 304 or 316, as defined by the American Iron and Steel Institute classification, shall be permitted in preservative treated wood above or below grade. Fasteners or fastener materials not otherwise permitted under this article shall be permitted if adequate comparative tests for durability, including the effects associated with wood treating chemicals, demonstrate performance equal to or greater than the specified fasteners or fastener materials.

(b) *Materials.* All lumber and plywood shall be treated in accordance with the following adopted standard and shall be identified as to conformance with such standard by an approved inspection agency:

1. AWPB FND.

Note: See s. COMM 53.64 concerning wood foundations.

COMM 53.62 SPECIAL SYSTEMS.

(1) WOOD TRUSSES. Wood trusses shall be constructed in accordance with the following recommended standard and the listed exceptions:

(a) TPI-85.

1. Exceptions and additions:

a. Section 302.2. Moment coefficients used in the design of top chord members shall be based on the assumption of no fixity at member ends or joints due to plate connectors. Moment and buckling factors as indicated in section 3.2 of TPI-85 are acceptable.

b. Metal plate connectors shall be identifiable as stated in s. COMM 53.61 (8)(a).

c. The modification of design stresses for duration of load shall be as specified in s. COMM 53.61 (1)(a) 1.c.

(b) For trusses with nail-glued plywood gusset plates, calculations and design reference source shall be submitted to the department.

(c) Mechanically fastened trusses shall conform to section 8.4, "Timber Connector Joints," of National Design Specification.

COMM 53.63 MINIMUM CONSTRUCTION REQUIREMENTS.

The requirements of this section shall apply to all wood framing.

Note: Recognized wood framing and construction details indicated in "Wood Construction Data No. 1 and No. 5" of the National Forest Products Association, Technical Services Division (1619 Massachusetts Ave. NW, Washington, D.C. 20036) is recommended as good design and construction practice.

(1) **FIREBLOCKING.** Fireblocks shall be provided at all intersections of interior and exterior walls with floors, ceilings and roof in such manner as to effectively cut off communication by fire through hollow concealed spaces and prevent both vertical and horizontal drafts.

(a) Furred walls shall have fireblocks placed immediately above and below the junction of any floor construction with the walls, or shall be fireblocked the full depth of the joist.

(b) All spaces between chimney and wood framing shall be solidly filled with noncombustible material at floor levels.

(c) All concealed spaces between stair stringers at the top and bottom of the stair run shall be fireblocked.

(d) All wood fireblocks as required in this section shall be lumber not less than 2 inches in nominal thickness, or 3/4 inch thick plywood with joints backed, and not less in width than the enclosed space within the partition except as provided for chimneys. Fireblocks may also be of 1/2 inch gypsum board, fiberglass or noncombustible materials, securely fastened in place.

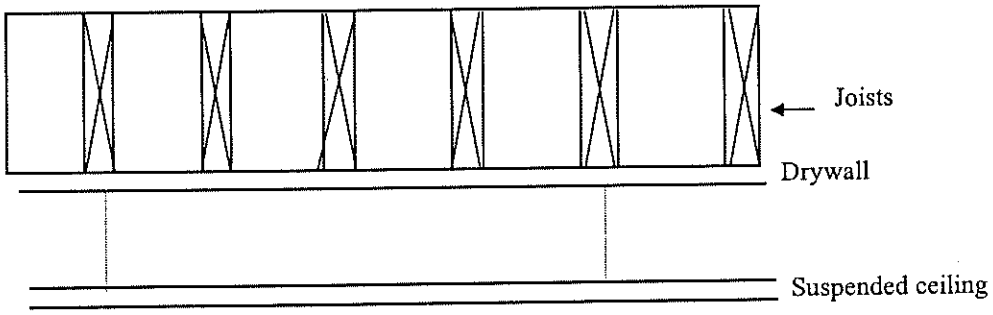
(2) **DRAFTSTOPPING.**

(a) Where a ceiling is suspended below solid wood floor joists, or either suspended or attached directly to the bottom of open web floor trusses, the space between the ceiling and the floor above shall be divided by draftstopping into areas, whichever is the least, as follows:

1. At rental tenant separation walls, if the walls do not extend above to the floor sheathing;
2. At living unit separation walls, if the walls do not extend above to the floor sheathing; or
3. Into areas not exceeding 1,000 square feet.

(b) Draftstopping as required in this subsection shall be at least 1/2 inch gypsum board, 3/8 inch plywood or other equivalent materials which are adequately supported.

Question: *Instead of vertically draft stopping a suspended ceiling space, may drywall be installed horizontally on the joists?*



Answer: *Yes. The intent is to draft stop concealed combustible spaces. This is usually installed from the suspended ceiling to the flooring above.*

If drywall is applied on the joists and the joist area is draft stopped into areas not exceeding 1,000 square feet, the space between the drywall and the suspended ceiling will be considered noncombustible space, thus draft stopping is not needed below the horizontal drywall membrane.

The solid joists may act as draft stops.

(3) WOOD FRAMING INTO FIRE-RATED MASONRY WALLS. See s. COMM 51.045 (1)(m).

(4) FIRE-CUTTING. Wood members supported in masonry walls shall have the ends of such members splayed or firecut to allow free end rotation in the vertical plane of the member, out of the masonry wall. See also s. COMM 53.34 (3)(b) 5.b.

(5) BEARING.

(a) *Joists and trusses.* The ends of each joist or truss shall have not less than 1 1/2-inch length of bearing on wood or metal nor less than 3-inch length on hollow or solid masonry units.

(b) *Beams and girders.* The ends of beams or girders supported on masonry or concrete shall have not less than 4-inch length of bearing. See also s. COMM 53.34 (3).

(6) NOTCHING AND DRILLING. No notching of outer fibers of structural members is permitted unless substantiated by design calculations. Circular holes bored in joists and studs that are within the middle one-third of the depth of joist or studs are permitted without design calculations.

(7) DECAY PREVENTION. Where wood is used in parts of a building exposed to moisture that causes the moisture content of wood to exceed 19%, the wood shall be adequately ventilated or treated with preservative. All lumber and plywood required to be treated with a preservative shall be identified by a quality mark or certificate of inspection of an approved inspection agency which maintains continued supervision, testing and inspection over the quality of the product in accordance with the adopted standards of the American Wood Preservers Bureau.

(a) All wood columns, posts and frame legs whose base is subject to deterioration due to moisture shall bear on concrete or other inorganic materials which extend at least 3 inches above the adjacent surface unless treated with preservative.

The intent of this section is to limit the possibility of moisture causing the wood to rot. If the inspector feels moisture will accumulate at the base of the column, the base should be raised.

(b) The ends of wood structural members built into exterior masonry walls or into concrete shall be treated with preservative or a moisture-proof barrier shall be installed on the bearing surface.

Note: In areas subject to termite attack, refer to "Design of Wood Structures for Permanence" (published by the National Forest Products Association, 1619 Massachusetts Ave. NW, Washington, D.C. 20036) as suggested by National Design Specifications, Appendix F, section B.2.

(8) TRUSS BRACING AND ANCHORAGE. All wood trusses shall be securely fastened to the supports and each truss shall be secured in position in accordance with National Design Specification, Appendix A, section A.10.

(9) ANCHORAGE. Anchorage shall be in accordance with s. COMM 53.12 (2).

(10) CROSS BRIDGING. Cross bridging shall be furnished in accordance with section 4.4.1 of NDS. When joists support floor or roof decks other than wood or wood decks which are not adequately attached, cross bridging shall be provided at 8-foot intervals.

(11) SOLID BLOCKING. All floor and roof joists shall be supported laterally at the ends and at each support by solid blocking or other approved methods. Solid blocking shall be not less than 2 inches in nominal thickness and the full depth of the joist.

Solid backing. *Acceptable methods of providing lateral support of joists at points of bearing include solid blocking, bridging or securely fastening the joists to other framing members to prevent rotation.*

(12) JOIST SUPPORT. Floor or roof joists shall not be toe nailed into the side of beams and girders for support. Such joists shall be supported by joist hangers, ledgers or metal plate connectors of adequate structural capacity.

(13) STUD WALLS. Unless evidence is provided to indicate otherwise, the maximum spacing and height of studs shall be in accordance with Table 53-XVIII. Notching and drilling of studs shall conform to sub. (5). Where load-bearing studs are spaced at 24-inch intervals, the roof trusses, rafters, and joists shall be centered over the studs or, in lieu thereof, solid blocking equal in size to the studs shall be installed to reinforce the double plate above.

There is now evidence to indicate the maximum heights of stud walls in Table 53-XVIII are erroneous and should not be used. Stud wall height should be determined by using the criteria found in the current NDS (National Design Specification for Wood Construction).

(14) MINIMUM RECOMMENDED NAILING SCHEDULE. Unless evidence of design for the connection is provided, the connection shall have a minimum nailing in accordance with Table 53-XIX or its equivalent.

Nailing schedule. *The nailing in Table 53-XIX is a recommended minimum for conventional framing. Construction involving longer spans, wider spacing of members, roof overhangs and open structures subject to uplift from wind require additional nailing or special fastening.*

TABLE 53-XVIII
MAXIMUM SPACING AND HEIGHT OF STUDS

Size	Grade Referring to Fb and Fc	Height (Feet)	(Spacing Inches)	
			Exterior or Load-Bearing	Interior and Nonload-Bearing
2 by 4 or larger	Utility	8	16	24
2 by 3	Standard and better	8	16	16
2 by 4—3 by 4	Standard and better	12	16	24
2 by 6 or larger	Standard and better	18	24	24

TABLE 53-XIX
MINIMUM RECOMMENDED NAILING SCHEDULE

Connection	Nailing (Using common nails)
Joist to sill or girder, toe nail	3-8d
Bridging to joist, toe nail each end	2-8d
Ledger strip	3-16d at each joist
1"x6" subfloor or less to each joist, face nail	2-8d
Over 1"x6" subfloor to each joist, face nail	3-8d
2" subfloor to joist or girder, blind and face nail	2-16d
Sole plate to joint or blocking, face nail	16d at 16" o.c.
Top plate to stud, end nail	2-16d
Stud to sole plate, toe nail	4-8d
Doubled studs, face nail	16d at 24" o.c.
Doubled top plates, face nail	16d at 16" o.c.
Top plates, laps and intersections, face nail	2-16d
Continuous header, two pieces	16d at 16" o.c. along each edge
Ceiling joists to plate, toe nail	3-8d
Continuous header to stud, toe nail	4-8d
Ceiling joists, laps over partitions, face nail	3-16d
Ceiling joists to parallel rafters, face nail	3-16d
Rafter to plate, toe nail	3-8d
1" brace to each stud and plate, face nail	2-8d
1"x8" sheathing or less to each bearing, face nail	2-8d
Over 1"x8" sheathing to each bearing, face nail	3-8d
Built-up corner studs	16d at 24" o.c.
Built-up girders and beams	20d at 32" o.c. along each edge

COMM 53.64 WOOD FOUNDATIONS.

Foundations may be constructed of treated wood when the design is based upon the soil bearing values contained in s. COMM 53.21 and the structural design is in accordance with the standards listed in s. COMM 53.61. All pressure-treated wood and plywood shall be treated and identified in accordance with adopted standards of the American Wood Preservers Bureau.

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Chapter COMM 54

FACTORIES, OFFICE AND MERCANTILE BUILDINGS

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COMM 54.001 SCOPE.

This classification includes all factories and workshops including all places where manual labor is employed, office buildings, telegraph and telephone offices, mercantile establishments where commodities are bought or sold, clothes cleaning establishments, warehouses, railroad stations, exhibition buildings, public mausoleums, crematoriums, and places where not more than 100 persons assemble for recreation, entertainment, worship, or dining purposes.

Funeral homes are considered places of worship.

Question: *Is a fire rated separation required in a mall between adjoining restaurants or bars which independently have a capacity of less than 100 occupants to still allow them to be considered under the scope of Chapter 54.*

Answer: *A Chapter 54 use does not have to be separated from another Chapter 54 use. Where dining, recreation or worship uses progress into a Chapter 55 use once the capacity exceeds 100 people, no internal openings which would allow patrons to go from one space to another without first going into the public mall corridor are permitted. Where internal openings between tenants are provided, the occupant capacity shall be cumulative.*

Designers of large, open buildings, such as fairground buildings and exhibition buildings, must be aware that the code requirements applicable to a building and occupancy chapter classification are based upon most critical use. Although an owner may contract for the design and construction of a building to be used for exhibition purposes, thereby placing that building under the scope of this chapter, if the owner also wishes to utilize that building for purposes of entertainment, recreation, worship or dining by more than 100 people at times, the building will also fall under the scope of COMM Chapter 55. In cases such as this, the building must comply with the requirements of both occupancy chapters, and where requirements conflict between the chapters, the more restrictive requirement will apply.

Rooms in buildings of this classification which accommodate more than 100 persons for purposes of entertainment, recreation, dining or worship, but are provided solely for use by the building occupants and not the general public are considered under the scope of COMM 54.

When a building of questionable occupancy is presented to the department, and that structure meets the definition of being a building and is either a place of employment or a public building, the scopes of all of the occupancy chapters will be analyzed with respect to the use of the building. If none of the scopes of Chapter COMM 55 through 62 apply, the building will be classified under the scope of Chapter COMM 54 even if it does not completely fall into this scope paragraph. In other words, COMM 54 is the fall-back chapter for classifying occupancies that cannot be classified under other occupancy chapters.

Designers should consider potential future expansion of buildings, particularly taverns, restaurants and churches. The requirements of COMM 55 are much more restrictive than those of COMM 54. Although a new tavern, restaurant or church which has an occupancy of less than 100 can be constructed under the scope of this chapter, if that building is enlarged in the future, it most probably will move into Chapter COMM 55. This change in occupancy chapters based upon an addition is considered a change of use which will require that the original Chapter 54 building be upgraded to Chapter 55 standards. It is suggested that you plan ahead and if there is a potential for future enlargement to construct the original building in accordance with COMM 55 standards or make provisions for adaptation of the current building in the future.

Adult day care centers are becoming more and more prevalent. If they will be accommodating over 100 persons, the center should comply with ch. 55 occupancy rquirements. Smaller facilities will fall under the scope of this occupancy chapter.

Note 1: See ch. COMM 7 for other provisions relating to setbacks and construction for a magazine within which explosives are stored.

Note 2: The department of health and social services may require additional provisions for the federal certification of ambulatory surgical offices and clinics which receive federal funding.

COMM 54.01 CONSTRUCTION, HEIGHT AND ALLOWABLE AREA.

(1) GENERAL. Buildings and structures within the scope of this chapter may not exceed the height and area limitations specified in this section.

Note: See s. COMM 51.03 for standards of classes of construction.

See COMM 51.01 (4) for definition of area.

Tables 54.01-1 and 2 set forth the allowable areas of buildings based upon class of construction, number of stories, and "streets." Table 1 is applied to buildings which are not completely sprinklered and Table 2 applies to buildings which are completely sprinklered.

Under this section of the code, sprinkler protection is considered a class of construction element. For instance, a building can be classified as Type 6 sprinklered or Type 6 unsprinklered. Due to this consideration of sprinklers as a class of construction element, the completely sprinklered portions of a building must be separated from unsprinklered portions of the building by a class of construction separation in accordance with COMM 51.02 (20). If no separation is provided, the entire building will be considered as unsprinklered.

(2) LIMITED AREA CH. COMM 54 BUILDINGS.

(a) Chapter COMM 54 buildings not protected by complete automatic fire sprinkler protection may not exceed the height and area limitations specified in Table 54.01-1.

(b) Chapter COMM 54 buildings protected by complete automatic fire sprinkler systems may not exceed the height and area limitations specified in Table 54.01-2.

If the increase in area or number of stories is taken based upon installation of a complete automatic fire sprinkler system, as permitted by Table 2, the reduction in fire-resistive ratings as allowed by COMM 51.02 (22) cannot be taken.

(c) Freezer warehouses complying with the requirements of s. COMM 51.06 (6)(a) 3.b. may be designed and constructed with the allowable floor area as specified in par. (b) and with the allowable increase in exit distance as specified in s. COMM 54.02 (4)(b) without being protected by a complete automatic fire sprinkler system.

***Freezer warehouses** are buildings wherein the interior temperature is maintained below 32°F. (0°C.). Refrigerated facilities maintained at higher temperature are not freezer warehouses. A freezer warehouse constructed and protected in accordance with COMM 51.06 (6)(a) 3.b. will, for purposes of applying COMM 54 requirements, be considered a sprinklered building. The area limitations of the building will be based on the requirements of Table 2, the allowance for unlimited area granted to sprinklered buildings will apply and exit distances will be based upon those applicable to sprinklered buildings.*

The 2-hour rated walls indicated by 51.06 (6)(a) 3.b. are intended to separate those areas of the building requiring different levels of foam plastic protection and will not serve as area division walls or class of construction separations. If a freezer warehouse is built with other use areas and the building requires unlimited area, the other use areas must be separated by 2-hour construction and be sprinklered (if sprinklers required in the freezer). If the other use areas are not sprinklered, they must be separated by 4-hour fire-division walls and meet area limitation requirements in their own right.

(3) FIRE DIVISION WALL SEPARATION.

(a) No building shall be limited in area when divided into sections which do not exceed the maximum areas tabulated in this section by fire division walls specified in s. COMM 51.02 (13).

(b) All openings in such walls shall be protected by fire-resistive door assemblies as specified in s. COMM 51.047.

1. Except as provided in subd. 2, doors protecting such openings may be left open if equipped with an automatic closing device activated by products of combustion other than heat.

2. a. The automatic closing device may be installed to prevent accidental closing of the fire door in the event of a power outage to the building if it is installed with an approved or listed backup mechanism in addition to the smoke detection release device.

b. The automatic closing device on doors located in smoke- or contaminant-filled environments such as but not limited to foundries, chemical plants and similar environments, may be activated by rate-of-rise heat detectors.

3. Doors used as required exits shall be standard exit doors and shall comply with the requirements of s. COMM 51.19 (2).

(4) UNLIMITED AREAS.

Please note that the provisions for unlimited area as found in (a) apply only to buildings which are completely protected with an automatic sprinkler system. The provisions for unlimited area found in (b) are applicable to buildings which are not protected by a sprinkler system.

(a) The area of buildings completely protected by an automatic fire sprinkler system may be unlimited provided the following conditions are satisfied:

1. The maximum number of stories is limited as follows:
   a. Type No. 2 construction—9 stories;
   b. Type No. 3 construction—5 stories;
   c. Type No. 4 and 5A construction—3 stories; and
   d. Type No. 5B and 6 construction—2 stories involving not more than 4 floor levels.
2. Street access is provided as specified in sub. (5)(b).

(b) There shall be no area restriction in one-story buildings where the following conditions are satisfied:

1. Construction of all building elements listed in Table 51.03-A are of noncombustible materials. Built-up roof coverings may not be used;

Please note that single or multiple ply built-up roof coverings are prohibited.

2. a. The contents of the building are noncombustible;

***Interior loading and shipping docks**, unless separated from the balance of the building by 4-hour fire-division walls, are prohibited due to the combustible nature of the vehicles.*

   b. Stored materials are not packed or crated in combustible materials; and
3. Street access is provided as specified in sub. (5)(b).

Unlimited area is permitted for unsprinklered buildings which are of totally noncombustible construction and where the contents are totally noncombustible. The intent is to permit unlimited areas where there is nothing in the building construction nor in the content of the building which will burn. Therefore, since there is nothing which will burn, a sprinkler system is not necessary. The department will interpret the noncombustibility of the building and the contents literally. The department will not permit offices, locker rooms, lunch rooms, combustible shelves or racks, combustible pallets, flammable or combustible liquids, combustible packaging materials, etc. If occupancies involving combustible materials or construction are desired, those areas of the building must be separated from the unlimited area building by a 4-hour fire-division wall in accordance with COMM 51.02 (13). It is not acceptable to sprinkler those areas of the building involving combustibles while maintaining the balance of the building unsprinklered. Submitters wishing a building reviewed under the unsprinklered, unlimited area classification must submit a letter from the owner of the building specifically stating that no combustible materials will be located within the building.

TABLE 54.01-1

ALLOWABLE HEIGHT (STORIES) AND AREA (SQUARE FEET) FOR BUILDINGS WITHOUT COMPLETE AUTOMATIC FIRE SPRINKLER SYSTEM PROTECTION (MAXIMUM GROSS FLOOR AREA PER FLOOR)

NOTE: DO NOT USE FOR BUILDINGS EXCEEDING 60 FEET IN HEIGHT

Class of Construction	Building Frontage Street Exposure	Number of Stories								
		1	2	3	4	5	6	7	8	Over 8
1. Fire-Resistive Type A	1	25,000	22,000	19,000	16,000	13,000	11,000	9,000	8,000	6,000
	2	30,500	27,000	24,000	20,500	17,500	15,000	13,000	12,000	10,000
	3	36,000	33,000	29,000	25,000	22,000	19,000	17,000	16,000	14,000
	4	41,500	39,000	34,000	29,500	26,500	23,000	21,000	20,000	18,000
2. Fire-Resistive Type B	1	23,000	20,000	17,000	14,000	11,000	9,000	7,000	6,000	
	2	28,000	25,000	22,000	18,500	15,500	13,000	11,000	10,000	N.P.
	3	34,000	31,000	27,000	23,000	20,000	17,000	15,000	14,000	
	4	39,500	37,000	32,000	27,500	24,500	21,000	19,000	18,000	
3. Metal Frame Protected	1	21,000	18,000	15,000	12,000					
	2	26,500	23,000	19,500	16,000	N.P.	N.P.	N.P.	N.P.	N.P.
	3	32,000	28,000	24,000	20,000					
	4	37,500	33,000	28,500	24,000					
4. Heavy Timber	1	17,000	14,000	11,000	9,000					
	2	22,000	19,000	16,000	13,500	N.P.	N.P.	N.P.	N.P.	N.P.
	3	27,000	24,000	21,000	18,000					
	4	32,000	29,000	26,000	22,500					
5A. Exterior Masonry Protected	1	15,500	13,500	9,500	8,000					
	2	20,000	17,000	14,000	12,500	N.P.	N.P.	N.P.	N.P.	N.P.
	3	24,500	21,500	18,500	15,500					
	4	29,000	26,000	23,000	19,500					
5B. Exterior Masonry Unprotected	1	14,000	11,500	9,000						
	2	18,000	15,000	12,500	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	22,000	19,000	16,000						
	4	26,000	23,000	19,500						
6. Metal Frame Unprotected	1	14,000	11,500	9,000						
	2	18,000	15,000	12,500	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	22,000	19,000	16,000						
	4	26,000	23,000	19,500						
7. Wood Frame Protected	1	12,500	7,500	5,500						
	2	16,000	10,000	7,000	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	19,000	12,000	8,500						
	4	22,000	14,000	10,000						
8. Wood Frame Unprotected	1	10,000	5,000							
	2	12,000	6,000	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	14,000	7,000							
	4	16,000	8,000							

N.P. means Not Permitted

54.01-2

ALLOWABLE HEIGHT (STORIES) AND AREA (SQUARE FEET) FOR BUILDINGS COMPLETELY PROTECTED BY AUTOMATIC FIRE SPRINKLER SYSTEM
(MAXIMUM GROSS FLOOR AREA PER FLOOR)
NOTE: USE FOR ALL BUILDINGS

	Class of Construction	Building Frontage Street Exposure	Number of Stories									
			1	2	3	4	5	6	7	8	9	Over 9
1.	Fire-Resistive Type A Stories and area may be unlimited subject to s. COMM 54.01 (5)(b)	1 2 3 4	NO LIMIT									
2.	Fire-Resistive Type B 1 to 9 story area may be unlimited subject to s. COMM 54.01 (5)(b)	1 2 3 4	NO LIMIT	69,000 85,500 102,000 118,500	60,000 75,000 93,000 111,000	51,000 66,000 81,000 96,000	42,000 55,500 69,000 82,500	33,000 46,500 60,000 73,500	27,000 39,000 51,000 63,000	21,000 33,000 45,000 57,000	18,000 30,000 42,000 54,000	N.P.
3.	Metal Frame Protected 1 to 5 story area may be unlimited subject to s. COMM 54.01 (5)(b)	1 2 3 4	84,000 106,000 128,000 150,000	63,000 79,500 96,000 112,500	54,000 69,000 84,000 99,000	45,000 58,500 72,000 85,500	36,000 48,000 60,000 72,000	N.P.	N.P.	N.P.	N.P.	N.P.
4.	Heavy Timber 1 to 3 story area may be unlimited subject to s. COMM 54.01 (5)(b)	1 2 3 4	68,000 88,000 108,000 128,000	51,000 66,000 81,000 96,000	42,000 57,000 72,000 87,000	33,000 48,000 63,000 78,000	27,000 40,500 54,000 67,500		N.P.	N.P.	N.P.	N.P.
5A.	Exterior Masonry Protected 1 to 3 story area may be unlimited subject to s. COMM 54.01 (5)(b)	1 2 3 4	62,000 80,000 98,000 116,000	46,500 60,000 73,500 87,000	40,500 51,000 64,500 78,000	28,500 42,000 55,500 69,000	24,000 37,500 46,500 58,500		N.P.	N.P.	N.P.	N.P.
5B.	Exterior Masonry Unprotected 1 story area may be unlimited subject to s. COMM 54.01 (5)(b)	1 2 3 4	56,000 72,000 88,000 104,000	42,000 54,000 66,000 78,000	34,500 45,000 57,000 69,000	27,000 37,500 48,000 58,500	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
6.	Metal Frame Unprotected 1 story area may be unlimited subject to s. COMM 54.01 (5)(b)	1 2 3 4	56,000 72,000 88,000 104,000	42,000 54,000 66,000 78,000	34,500 45,000 57,000 69,000	27,000 37,500 48,000 58,500	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
7.	Wood Frame Protected	1 2 3 4	50,000 64,000 76,000 88,000	37,500 48,000 57,000 66,000	22,500 30,000 36,000 42,000	16,500 21,000 25,500 30,000	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
8.	Wood Frame Unprotected	1 2 3 4	40,000 48,000 56,000 64,000	30,000 36,000 42,000 48,000	15,000 18,000 21,000 24,000	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.

N.P. means Not Permitted

(5) STREET ACCESS TO BUILDINGS.

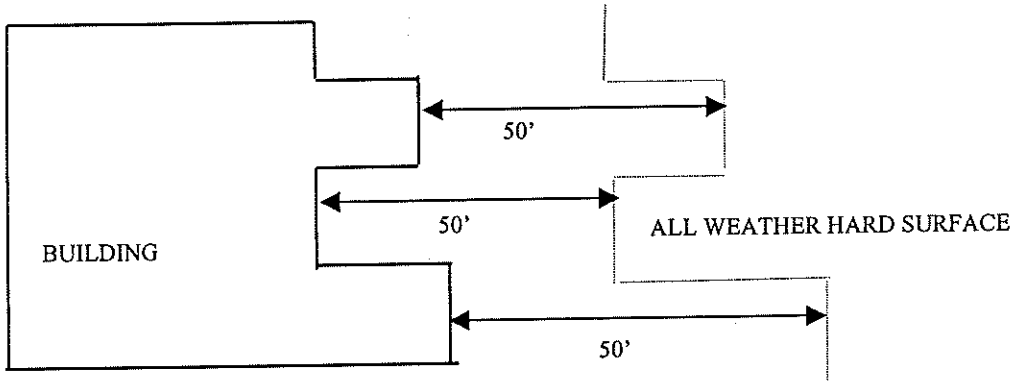
(a) Streets shall be within 50 feet of the adjacent building side with no obstructions between the street and the building which will impede fire-fighting efforts.

See COMM 51.01 (124) commentary.

Note: See s. COMM 51.01 (124) for definition of street.

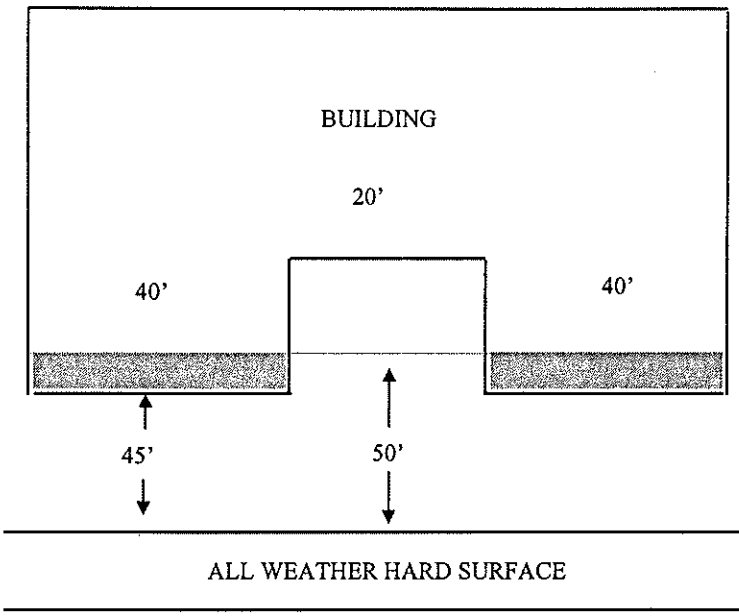
COMM 51.01 (124) Street Determination.

a) The intent of providing a street is to assure a fire truck can be maneuvered into positions where typical available fire hose length would be able to provide adequate coverage to fight a fire. The code requires a street to be within 50 feet of a building; thus, lines drawn parallel to and 50 feet distance from the building sides indicate the boundaries relating to this requirement (see Figure A). The code also requires a street to ***extend*** *along at least 50 percent of the building side. To determine this percentage, project lines perpendicular from the building side to the portion of the all-weather hard surface area which is within 50 feet of the building. The length of the building side which has an all-weather hard surface within the boundaries of the projected perpendicular lines and the 50 feet distance, divided by the length of the total side is the percentage of street extension. (See Figure B and C).*



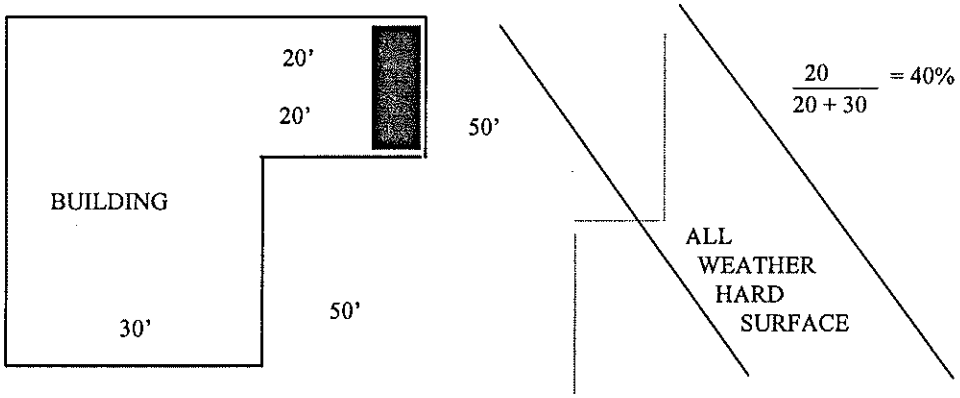
A

B



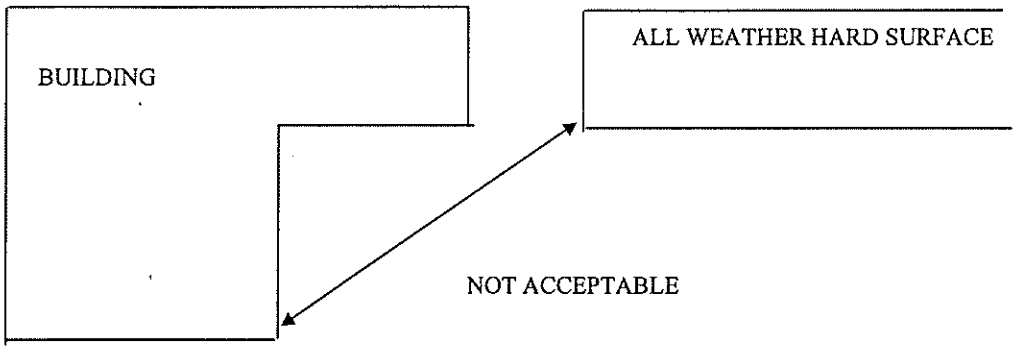
$$\frac{40 + 40}{40 + 20 + 40} = 80\%$$

C



$$\frac{20}{20 + 30} = 40\%$$

D



*Swinging an arc to increase the percentage of street extension is **not** allowed.*

b) Section 54.01 (5) requires that a street be not less than 30 feet wide, extend 50 percent of the building side, and be within 50 feet of the building. The department will approve streets which do

not meet these specific requirements provided a letter is submitted from the chief of the fire department having jurisdiction, stating that the "substandard" street is acceptable. A street must be provided on the required sides of the building. A letter from the fire chief will not serve to omit a street, only to approve a street not meeting certain requirements.

c) Under certain circumstances, the department will consider a 4-hour fire-division wall as a street. If a structure is divided into sections by means of 4-hour fire-division walls, the entire structure must be analyzed with respect to the number of streets provided. The number thus determined is the maximum number of streets any section of that structure may have. Each section of that structure is then analyzed utilizing the number of sides facing true streets plus the number of sides facing 4-hour fire-division walls. If that number exceeds the number of streets the entire structure has, the number of streets applied to the section is reduced to the lower number.

d) Every building and every section of a building must be provided with at least one street complying with the requirements of COMM 51.01 (124). A building section will not be permitted if all four sides are bounded by 4-hour fire-division walls.

Keep in mind that the allowable floor areas are listed on a per floor basis. For example, a three-story unprotected exterior masonry building with one street exposure would have a maximum allowable floor area of 9,000 square feet ***per floor****.*

(b) 1. Unlimited area buildings of fire-resistive type 1 construction and one-story unlimited area buildings of fire-resistive type 2 construction shall be provided with street access as defined in s. COMM 51.01 (124) to at least one side of the building.

2. Unlimited area buildings of type 3 through type 6 construction shall have a continuous all-weather, hard-surfaced area 30 feet or more in width for a distance of not less than 50% of the perimeter of the building. These buildings shall have at least one wall facing a street for its entire length. At least 2 of the remaining building walls shall face streets for at least 50% of their respective lengths.

(6) HEIGHT EXCEPTIONS. Rack storage facilities of noncombustible construction protected with automatic fire sprinkler systems installed in accordance with NFPA No. 231C--Standard for Rack Storage of Materials, may be of unlimited height.

(7) PUBLIC MAUSOLEUM CONSTRUCTION. Public mausoleum structures shall be constructed in accordance with s. COMM 51.03 and mausoleum spaces shall be constructed of reinforced concrete.

COMM 54.02 NUMBER AND LOCATION OF EXITS.

(1) NUMBER OF EXITS. Every building and every floor level thereof shall have at least 2 exits.

The basic requirement of the code is that every building and every floor level in the building must have at least two exits. Additional exits may be required based upon exit distance, aggregate exit width needs, and distribution of exits. If it is desired to have only a single exit serving a building or floor level, one of the exceptions included in this chapter must be applicable to the floor or building. If no exception can be applied, at least two exits will be required.

See Shopping Mall Informational Bulletin *in the design supplement at the end of this book.*

(2) EXCEPTIONS. One exit will be permitted in the following conditions:

(a) Floor levels used entirely for storage in buildings 2 stories or less in height and not over 3,000 square feet gross area per floor.

Although this code section is limited to buildings of not more than two stories, the department will accept, regardless of the number of stories in the building, a single exit from floor levels under 3,000 square feet and used only for storage or mechanical equipment provided that floor level is not more than one level above or below exit discharge. Toilet rooms are not allowed on such a storage level

(b) Interior balconies or mezzanine floors not over 3,000 square feet gross area used entirely for storage.

When applying (a) and (b), in addition to the storage limitation, the department will accept unoccupied mechanical equipment rooms, however the total floor area is limited to 3,000 square feet. It should be noted that if the floor level is provided with toilet rooms, the floor level will be considered as occupied and two exits will be required.

(c) Open interior balconies or open mezzanine floors not over 750 square feet gross area used for purposes other than nonoccupied storage.

See commentary under COMM 51.02 (11)(b) 2. for open balcony or mezzanine criteria.

COMM 54.02 (2)(b) and (c) are independent exceptions. If a mezzanine larger than 750 square feet contains both storage use and nonstorage use, a minimum of two exits are required.

For exiting purposes, a roof deck may not be considered an open balcony or mezzanine because the occupant cannot detect danger on the lower floor level through which the occupant must exit. A roof utilized as an occupied space must be considered a floor level, thus must exit as a floor level. Occupancy chapters indicate a minimum of two exits are required from every floor level unless specific exceptions are satisfied.

(d) One-story office buildings, without a basement or mezzanine, having a gross floor area, per floor, of not more than 1,800 square feet. Only one office operation per floor level shall be permitted. The single exit from the first floor or ground floor(s) shall be an outside exit serving only that floor level.

Please note that this exception applies only to office occupancies. It is not applicable to retail, tavern or restaurant, or other occupancies covered under the scope of Chapter 54.

Based on the nature of bulk storage, and the unavailability of floor space for occupancy, the department will permit a single exit from bulk storage warehouses regardless of area. However, the exit distances of COMM 54.02 must be met.

The interpretation applies to bulk storage warehouses. Bulk storage warehouses have no interior partitions, and the stored product is piled in the building, without aisles, with the exterior walls of the building typically serving as containment for the product stored.

The department will permit, in addition to swinging exit doors, sliding and overhead doors as exits from bulk storage warehouses.

(e) Retail establishments not over 750 square feet net area, provided there are 2 directions for exiting from the entrance door of the store.

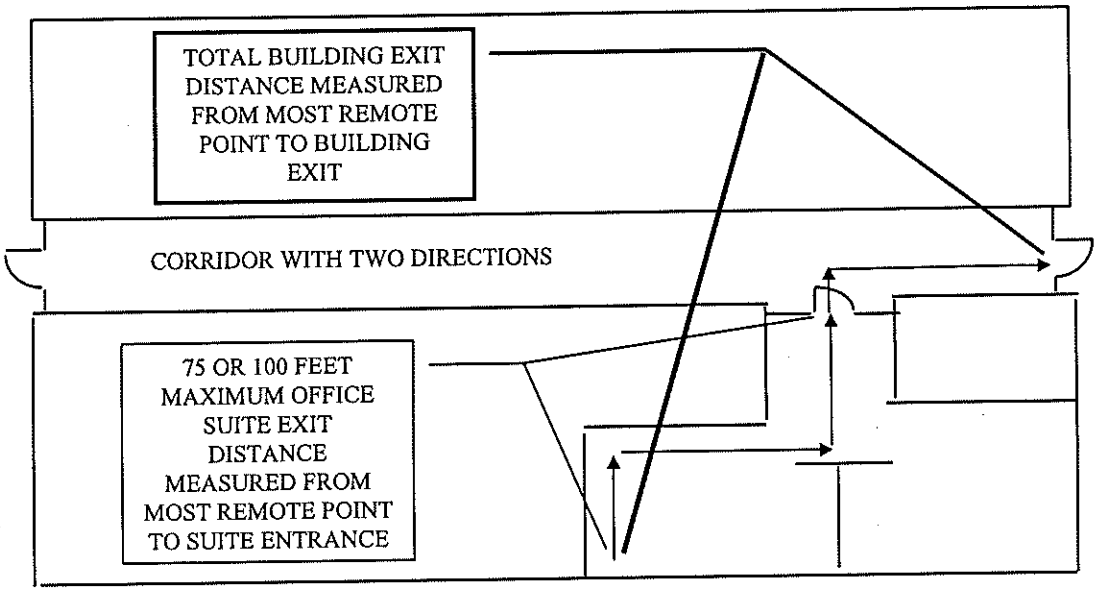
In addition to allowing a retail establishment of 750 square feet to have a single exit into a corridor providing two directions to exit, the department will permit a 750 square foot retail establishment with one exit if that exit leads directly to the exterior of the building.

(f) Enclosed interior mezzanine floors not over 750 square feet gross area may be used for office space, where the distance to the exit is no more than 100 feet in an unsprinklered building, or no more than 150 feet in a building completely protected by an approved automatic sprinkler system, provided:

1. Walls facing the lower level are a minimum of 30 percent glazed with vision panels; and

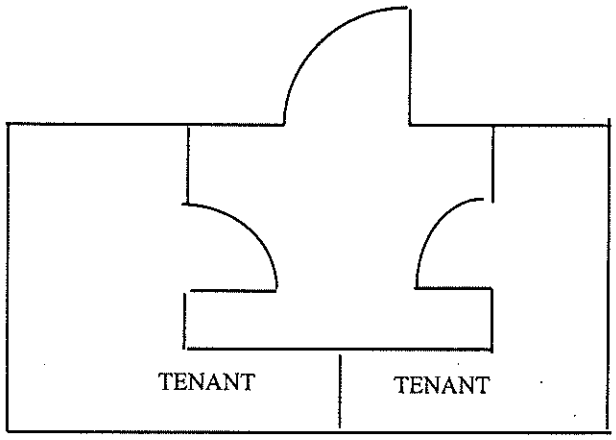
2. Smoke detection in accord with NFPA 72 or an equivalent system acceptable to the department is provided to all parts of the building within 100 feet of the mezzanine, with the detectors on the main floor and a horn in the mezzanine level.

(3) OFFICE SUITE EXITING. One exit or exit access may be permitted from office suites having a floor area of not more than 1,800 square feet net area, provided there are 2 directions for exiting from the exit or exit access from the suite and provided the exit distance within the suite, to the exit or exit access from the suite, does not exceed 75 feet in an unsprinklered building or 100 feet in a completely sprinklered building.

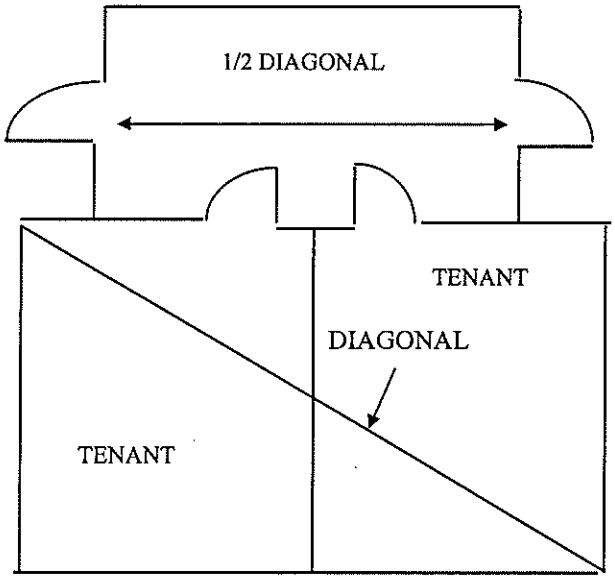


This provision applies only to an office suite on a floor. The floor must have at least two exits. Only the office suite is permitted with a single exit access. A floor level of 1,800 square feet with a single office occupancy on that floor is required to have at least two exits.

Office suites less than 1800 square feet are only required to have one exit as per COMM 54.02 (3). Upon leaving the suite however, the occupant must have access to two directions of travel. The angle between two directions of travel must be at least 90° or, if exiting via a large tenant's or common open room, the distance between exits spaced at least one-half the diagonal of the area served. (See following diagrams)



NOT ACCEPTABLE
ONLY ONE DIRECTION OF TRAVEL



ACCEPTABLE TWO DIRECTIONS OF TRAVEL

If the suite exits into a shared vestibule, the vestibule is not considered part of the tenant space. The vestibule must have two properly distributed exits.

(4) EXIT DISTANCE.

(a) Exits shall be distributed or located so that no part of any building within the scope of this chapter will be more than 150 feet distant from an exit.

(b) Where an approved automatic fire sprinkler system is provided throughout the building, an increase in exit distance to 200 feet will be permitted for mercantile buildings and an increase in exit distance to 300 feet will be permitted in all other buildings within the scope of this chapter, except high hazard buildings.

The exit distance in (a) and (b) may be required to be reduced based on COMM 54.08 open stairs or shaft restrictions.

Exit distance from the farthest point within a building to an exit is measured using 90° turns only. Measurement of distance using diagonals across spaces is not permitted. The department will permit measuring distance at a diagonal only in corridors. The intent is to not permit diagonal measurement in any area or room where furniture can be located.

(c) Buildings having contents which are liable to burn with extreme rapidity or from which poisonous fumes may be liberated or explosions occur in case of fire, shall have exits provided so that the maximum distance to exit is limited to 75 feet.

This provision for shortened exit distance applies only to those buildings having contents which are liable to burn or where poisonous fumes are liberated in case of fire. This provision is not applied to buildings or areas of buildings containing toxic or hazardous materials unless the rapid burning or toxic fumes as a result of fire are present. For purposes of applying this code restriction, the department does not consider carbon monoxide as a toxic or poisonous fume.

COMM 54.02 (4) (c) The use of the term "high hazard" as referred to in this section is intended to apply to operations and occupancies such as the following:

1. Dry cleaning establishments: using gasoline or other volatile flammable liquids.

2. Enameling or japaning.

3. Mills: sugar, starch cereal, feed, flour and grist mills.

4. Paint and varnish: manufacturing, storing, handling, spraying, and other related operations.

5. Pyroxylin products: manufacture and storage.

Pyroxylin plastic comprises the lower nitrated product and contains from 11 to 12 percent nitrogen.

6. Smoke houses.

7. Operations and occupancies determined to be high hazard by the Division of Safety & Buildings Fire Prevention Section also must satisfy these provisions.

(d) All of the above distances shall be measured along public passageways and aisles.

Note: Also see s. COMM 54.08 (1) for alternate exit distance provisions.

54.02 (4). Exit Distance. The following illustrations and text are provided to explain the procedure and intent of using the triangulation method of exit distance determination.

Exit travel must terminate at one of the following types of exits:

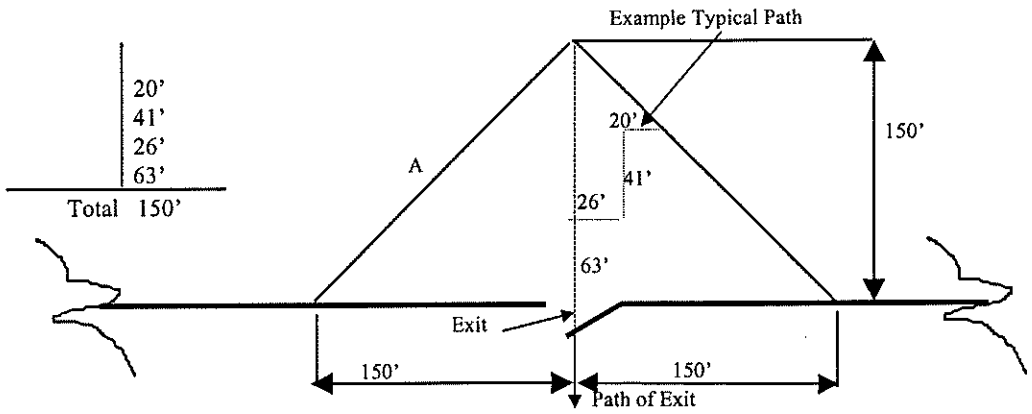
1. Standard exit to grade (COMM 51.15)

2. Enclosed stairways (COMM 51.17 and 51.18)

3. Horizontal exits (COMM 51.19)

4. Fire escapes (COMM 51.20)

Therefore, exit distance must be measured from one of these exit types. All exits must lead to a street, alley or open court which is connected to a street or alley.



Procedure:

1. Beginning at designated exit, measure straight out from the exit the required exit distance (150 feet, for example). Next measure the required exit distance to each side of the exit.

2. Connect end points to form the "exit triangle."

3. All areas within the triangle are within the required exit distance when traveling toward or at right angles to the exit.

4. All the interior space of a building must fall within the "exit triangles" formed by using the required exits for the building.

5. Location of an exit or exit access from the room must also be within the triangle. Room A above is beyond exit distance due to door location.

6. When measuring exit distance in stairways, only the horizontal travel distance is included in the determination.

(5) EXIT DISTRIBUTION. Exits in all buildings of this classification shall be so located and distributed so as to afford the best possible egress.

See 51.152 for egress configuration.

COMM 54.03 TYPE OF EXITS.

(1) At least one-half of the exits required in accordance with s. COMM 54.02 shall be stairways or standard exits to grade as specified in ss. COMM 51.15-51.18. The other exits shall be either stairways, standard exits, or horizontal exits as specified in s. COMM 51.19, or fire escapes as specified in s. COMM 51.20. A fire escape will not be accepted as a required exit for any building level more than 5 stories or 55 feet above grade. An outside wooden stairway may be used as an exit for a 2-story building.

(a) *Exception.* The width of required exit stairways serving unoccupied areas (i.e., storage areas, equipment mezzanines and similar areas) not exceeding 750 square feet may be reduced to 3 feet 0 inches.

(b) *Exception.* Less than 3 risers may be used to elevated work stations (such as pharmacy floors, computer floors and similar areas) or to altars, podiums and similar areas, not in a required exit passageway.

Question: *Can nonstandard exit stairs be used to provide access to security and observation towers in mercantile buildings? If so, what limitations are placed upon the design and construction of the observation tower and the nonstandard exit?*

Answer: *Yes. Typically, observation towers are occupied on an infrequent basis by security personnel to oversee the activities in the mercantile area of the building. The towers or observation areas are not open to the public.*

The tower floors are limited to a maximum of 32 square feet and must be located no higher than 10 feet above the store sales floor level.

Access to such towers may be provided by ship's ladder provided the ladder complies with the applicable provisions of Section 1910 of the Occupational Safety and Health Administration requirements. In addition, guardrails as specified in s. COMM 51.162 must be provided to protect the occupants of this elevated observation platform.

(c) *Exception.* A spiral stairway may be used as a nonrequired convenience stairway in addition to all other required exit stairways in places of employment.

Spiral stairs *are permitted only in those areas of the building occupied solely by employees. Spiral stairs will not be permitted in any area of the building which is accessible by the public or customers. The spiral stair is not considered as a required exit stair. The requirements for exiting must be met elsewhere.*

(d) *Exception.* A rescue platform (exterior balcony) of combustible construction may be used as a required second exit for buildings of type 5, 6, 7 and 8 construction, provided all of the following conditions are satisfied:

The intent of this section is to provide a means of exiting similar to that provided by a fire escape while not requiring fire escape construction when used under the limitations imposed by this section. A fire escape is a means of exiting located on the exterior of the enclosing walls of the building and is open to the air as a means of eliminating smoke generation concerns. Because the combustible rescue platform allowed by this section of the code is intended to function as a fire escape, it must also be located on the outside of the enclosing walls of the building and must be open to the atmosphere with no enclosing walls.

1. The exit serves 8 or less people;
2. The exit platform is located not more than 15 feet above the adjacent exit discharge grade;
3. The platform area is at least 14 square feet, with a minimum dimension of 3 feet;
4. The platform is designed for 80 pounds per square foot live load plus dead load;
5. Railings are provided in accordance with the provisions of s. COMM 51.162;
6. Platforms having solid floors are provided with a roof equal in area to that of the platform;
7. All wood used in the construction of the rescue platform shall be pressure treated wood satisfying the requirements of the applicable standards specified in s. COMM 53.63 (6) unless the wood is inherently resistant to decay; and
8. The exit door to the platform is not less than 2 feet 6 inches in width.

See COMM 57.05 commentary for additional rescue platform requirements.

(2) Every building which will accommodate more than 50 persons above the second story shall have at least 2 stairways.

(3) Wherever stairways are required under this classification, ramps with a slope not greater than one foot in 8 feet may be substituted. Ramps shall comply with all the requirements for stairways as to construction, enclosures, width, landing and lighting, and shall be surfaced with an approved nonslip material.

COMM 54.04 REQUIRED EXIT WIDTH.

(1) The total required exit width from a building level shall be in accordance with the requirements of ss. COMM 51.15 (6) and 51.16 (3).

(2) Standard fire escapes (s. COMM 51.20) may be substituted for stairways to the extent of not more than 1/3 of the required total width, subject to the provision of s. COMM 54.02.

(3) Horizontal exits in accordance with the requirements of s. COMM 51.19 may provide up to one-half of the required exit width for any floor, subject to the provisions of s. COMM 54.02.

COMM 54.05 CAPACITY OF BUILDINGS.

(1) In calculating the aggregate width of exits, the capacity of the buildings shall be established as follows:

(a) Stores, first floor and basement 30 sq. ft. per person

(b) Stores, second floor and above 60 sq. ft. per person

(c) Dining rooms, cafes, taverns, etc. 10 sq. ft. per person

(d) Places of seated assemblage 7 sq. ft. per person

(e) Warehouses 300 sq. ft. per person

(f) Factories and offices 75 sq. ft. per person

(g) Swimming pool rooms 10 sq. ft. per person for deck area.

Swimming pools are also regulated by Ch. Comm 90 of the Plumbing Code. It establishes maximum capacities for swimming/exercise pools, wading pools and whirlpools and requirements for associated dressing, shower and toilet facilities.

(2) The above figures are based on the net area of each occupied space. Where dining rooms, cafes, dance halls and places of seated assemblage accommodate more than 100 persons, see s. COMM 55.01.

The department will accept a furniture layout showing tables, chairs and stools for determination of the occupancy of conference rooms, taverns, and restaurants in lieu of utilizing the 10 square feet per person. Banquet and party rooms and other such rooms where the furniture is configured to meet the desires of the user of the room must have the occupancy based at 10 square feet per person.

Exiting requirements, including aggregate exit width, for factories and offices must be based on 75 square feet per person.

Retail stores may base capacity on 60 square feet per person of the gross area of the store or space, or 45 square feet per person of the retail area provided an interior partition layout is included on the plans showing non-retail areas, or 30 square feet per person of open, usable retail area

provided a complete store fixture layout is included with the plans. Exiting requirements, including aggregate exit width, and sanitary facilities will be based upon the occupancy determined.

The department will base sanitary facility requirements on a letter from the owner or operator stating the maximum number of employees and patrons which will be in the building at any one time. However, the ***exiting*** *requirements* ***may not be reduced*** *by means of such letter.*

(3) In other occupancies not specified above, the capacity shall be determined by the actual number of persons liable to be accommodated therein and no greater number of persons will be permitted therein.

See shopping mall informational notice *in the design supplement at the back of this book.*

COMM 54.06 EXIT DOORS.

(1) GENERAL. Every door which serves as an exit from a building, public passageway or stairway shall be a standard exit door as specified in s. COMM 51.15, except:

(a) Exit doors serving 25 or fewer persons need not swing in the direction of egress;

Held-open in-swinging doors are not permitted where the capacity exceeds 25 people.

(b) Exit access doors serving 25 or fewer persons may be reduced in width to 2 feet 8 inches and may be a sliding or accordian-type door;

When determining the number of people using a door, the number of people is the total capacity of the space served by that door. ***Do not divide*** *the number of people in the space by the number of doors to determine the number of people per door.*

Also see COMM 54.02 (2) commentary for bulk storage warehouses.

(c) Rolling, sliding and overhead types of doors or gates may be used as standard exit doors for tenant spaces in malls provided:

1. The door or gate is equipped with exit hardware in accordance with s. COMM 51.15 (3);

2. The door or gate is counterbalanced such that it can be opened by a force not exceeding 12 pounds or, if the door or gate is electrically operated, the door is supplied by an emergency power source capable of opening the door or gate;

3. The door or gate is maintained in a fully opened position during the business hours of the tenant space;

4. A security device permitted by s. COMM 51.15 (3)(e) 2. is not engaged when the tenant space is occupied; and

5. Manual, chain hoist operators for the doors or gates are not employed.

See shopping mall informational notice *in the design supplement at the back of this book.*

(2) ILLUMINATED EXIT SIGNS. Every exit door from each floor level, other than the principal entrance for the building, shall be marked with an exit sign as specified in s. COMM 51.15 (5).

Directional exit signs. *In addition to exit signs above exit doorways, directional exit signs may be required to guide the occupants to an exit doorway. For example, an occupant entering a*

passageway from an office should be able to see at least one directional exit sign. See discussion under COMM 51.15 (5).

(3) SECURITY GATES. Exterior security gates shall be permitted to protect exterior exit doors in accordance with this subsection.

(a) A security gate may not be closed or locked when the building or portion of the building protected by the security gate is occupied.

(b) When the gate is locked in place the gate shall be visible from the exterior of the building.

(c) A security gate may not be locked over exit doors which serve more than one building occupancy or tenant space.

(d) The locking device for a security gate which requires the use of a key or a combination to open it shall be accessible from the exterior of the building.

(e) The building owner shall send to the local fire department and building inspection department a letter indicating that a security gate is to be installed and maintained in accordance with this section.

(f) The department or its authorized deputies shall have the authority to revoke the use of any security gate for any exterior exit door upon the violation of any one provision specified in pars. (a) to (e).

COMM 54.07 EXIT ACCESS.

(1) Where there is not direct access to an exit or exits from an area within a building, exit access corridors, passageways, or aisles shall be provided to lead to the exit or exits.

(2) (a) The width of a corridor, passageway or aisle which provides access to an exit shall be at least:

1. Three feet, if the corridor, passageway or aisle serves a space with an occupant load not greater than 25 persons; and

2. Three feet 8 inches, if the corridor, passageway or aisle serves a space with an occupant load greater than 25 persons.

(b) The width of a corridor, passageway or aisle which provides egress from an exit shall be at least as wide as the required width for the exit served, as determined under ss. COMM 51.15 (6) and 51.16 (3).

(3) (a) The width of a corridor, passageway, or aisle which provides access to or egress from an exit shall be determined at the narrowest point produced by any projection or other similar object or obstruction.

(b) The required width of a corridor, passageway, or aisle which provides access to or egress from an exit as determined under this section shall be maintained clear and unobstructed at all times.

Note: See s. COMM 52.04 (9) for corridor widths to accommodate the physically disabled.

COMM 54.08 ENCLOSURE OF STAIRWAYS AND SHAFTS.

(1) (a) Except as provided in par. (b), all stairways including landings, ramps and shafts, shall be enclosed as specified in s. COMM 51.02 (11).

(b) 1. The stairways or shafts connecting one floor level with another floor level immediately adjacent to it may be left unenclosed where the distance to an exit from the area served by the open stairway including the horizontal travel distance on the exit access

stair, does not exceed 100 feet in buildings not completely protected by an approved automatic sprinkler system or 150 feet in buildings completely protected by an approved automatic sprinkler system; or

2. Any stairway or shaft connecting the second floor, first floor and basement or ground floor shall be separated at the first floor level or first adjacent basement or ground floor level with fire resistive construction as specified in Table 51.03-A or better in buildings 2 stories or less in height, and where the distance to an exit from the area served by the open stairway including the horizontal travel distance on the exit access stair, does not exceed 100 feet in buildings not completely protected by an approved automatic sprinkler system or 150 feet in buildings completely protected by an approved automatic sprinkler system.

COMM 51.02 (11) basically requires that all stairways and shafts be enclosed. Two adjacent floors may be opened to each other by means of unenclosed shafts and stairs as permitted by COMM 51.02 (11) and the exception found in this section of the code. More than two floor levels can be connected by open shafts under the provisions of COMM 52.07 related to atriums.

An exit stair which serves four or more floor levels must be enclosed per COMM 51.18.

***Question:** Several occupancy chapters (COMM 54.08, 57.08) allow open shafts when a shortened exit distance can be achieved. When floor levels are connected by open shafts and/or stairs, which floor levels are subject to a shortened exit distance?*

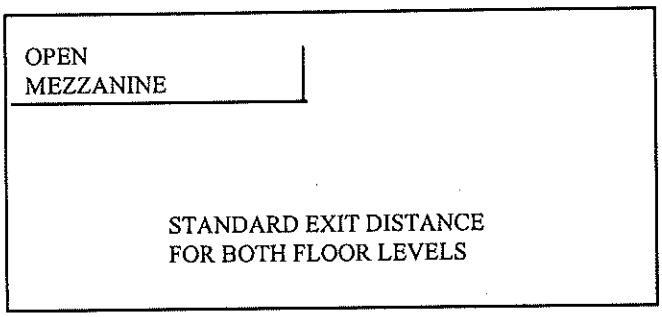
***Answer:** COMM 51.02 (11) initially requires all stairways and shafts to be enclosed. Certain exceptions are then specified.*

*The standard exit distance for a floor level was based on the possibility of a fire on **that floor**. However, since products of combustion tend to rise, a shortened exit distance applies where the exit passageway for a floor level would be affected by products of combustion rising from below.*

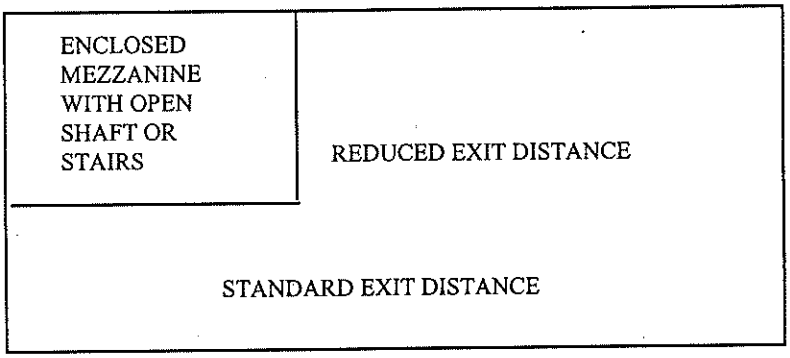
If the lower of the connected floors is below exit discharge, requiring occupants to go to the upper floor for any of the required exits, the shortened exit distance should apply to both of the connected levels. Open mezzanines and balconies are directly excepted by 51.02 (11) with no reference to the exit distance codes. Therefore, shortened exit distance does not apply to open mezzanines and balconies.

Where occupancy chapters specifically allow openings, apply the reduced exit distance to floor levels where exiting may be affected by smoke or products of combustion from other floor levels. See the following diagrams for examples of how these provisions apply.

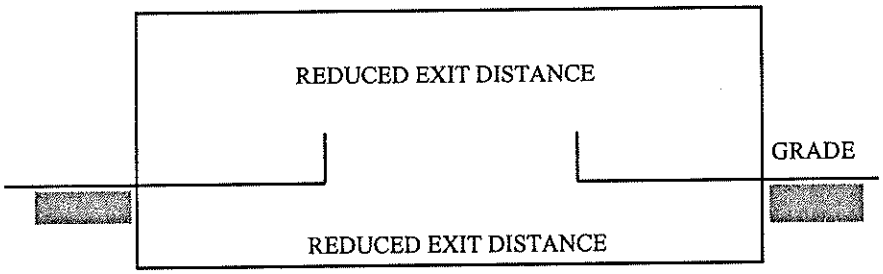
*Do not apply shortened exit distances to **open** mezzanines or balconies contained within a single story as exempted by COMM 51.02 (11)(b) 2.:*



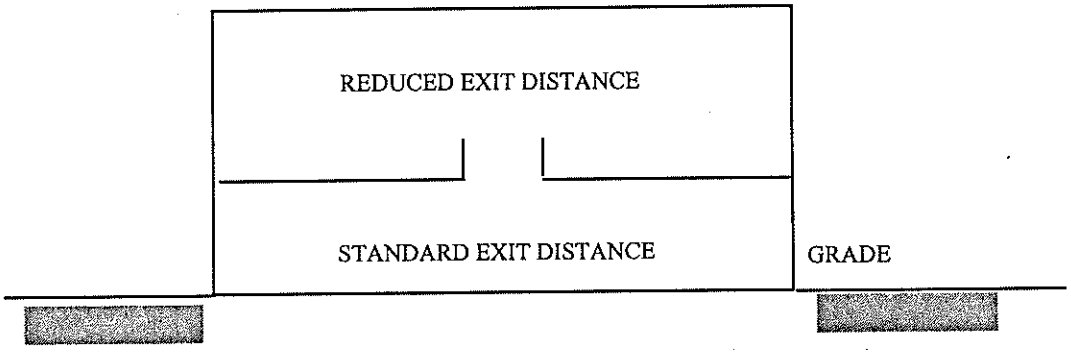
Do apply the shortened exit distance to enclosed mezzanine with opened stairways or openings to the floor below.:



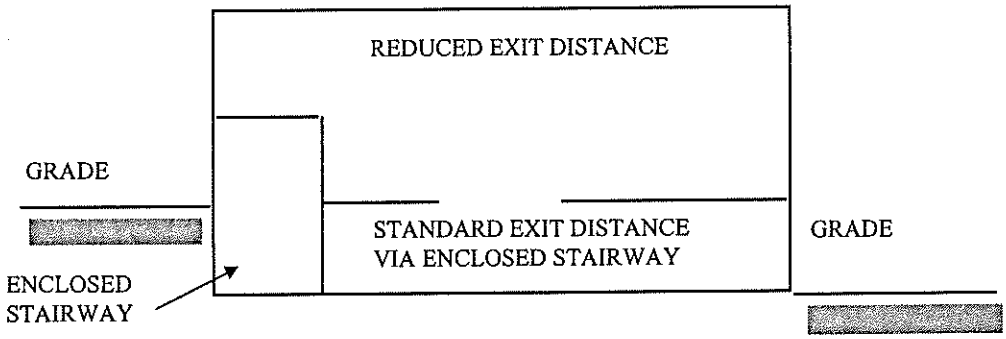
Apply the shortened exit distance. Smoke from the basement will affect exiting on the first floor. Occupants of the basement must exit via the first floor, thus are affected by the smoke rising from below:



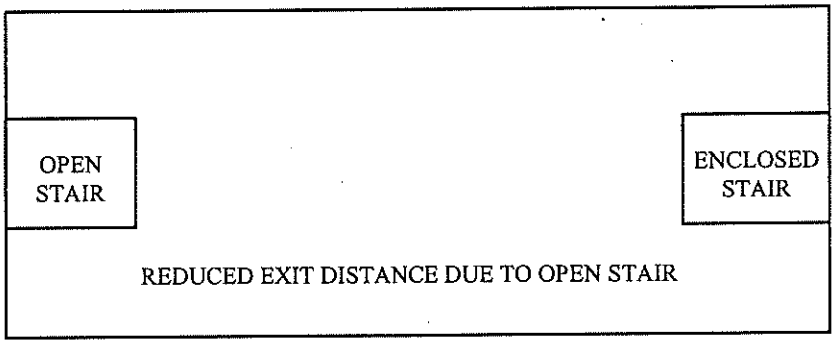
Apply the shortened exit distance to the upper level which may be affected by smoke from the first floor:



Apply the shortened exit distance to the upper level which may be affected by smoke from the first floor. If all of the lower level exits are to grade, and/or exit via enclosed stairs (COMM 51.18) up to grade, standard distance may be applied to the lower level.

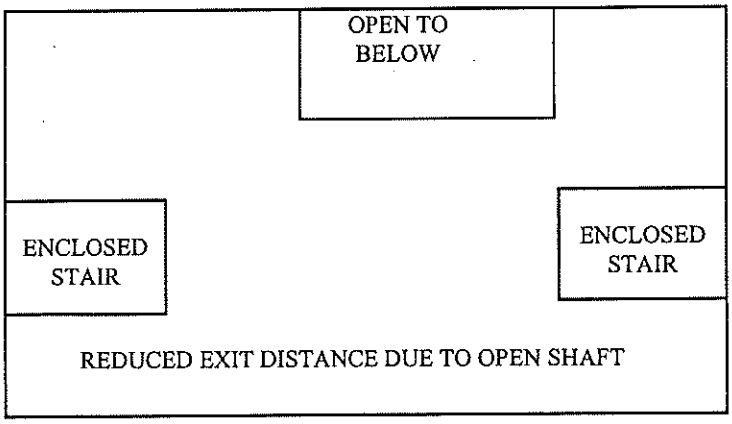


Due to the open stairs, the shortened exit distance must be applied to ***both*** *the open stairs and the enclosed stairs:*



Second Story Plan

Due to the floor opening, occupants may have to pass through an area filled with smoke from the floor below to reach the stairway, thus the shortened exit distance is applied and is measured to the doors leading into the enclosed stairs:



Second Story Plan

When applying the shortened exit distance, *determine the area within the allowable exit distance by the following methods:*

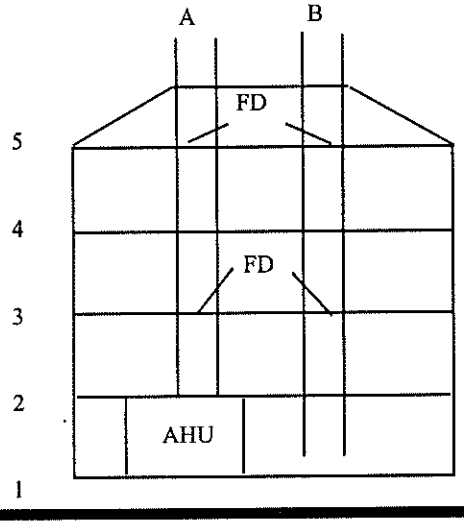
A. For areas served by enclosed stairs, use the triangular method (See COMM 54.02 commentary) measuring from the door to the enclosed stairway.

and

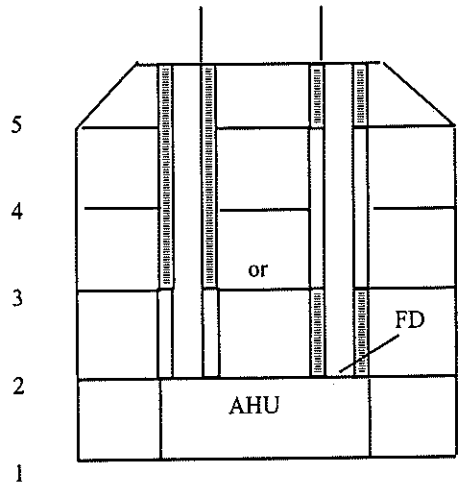
B. For areas served by the open stairs, measure to the stairs from the nearest outside exit door serving the open stairs, then horizontally along the stairs, then use the triangular method for the remaining allowable exit distance.

Question: *In cases where a multilevel shaft is allowed to have two levels open to each other, how may the other levels be protected?*

Answer: *The shaft may be protected by fire dampers at each floor/ceiling penetration other than the one allowed to be open or be protected by fire restrictive shaft enclosures. See example below:*



Unrated shaft walls. *No more than two adjacent floor levels may be open to each other. CAUTION: Other shafts, stairs, and openings between floors in the building* ***must all be cut off at the same levels*** *of the building. For instance, if shaft A is cut off between Levels 3 and 5, Shaft B must also be cut off between Levels 3 and 5.*



Rated shaft walls. *If rated shaft enclosures are utilized, the same principle applies. The code allows two adjcent levels to be open to each other, thus rated shaft walls must be constructed so that no more than two adjacent levels do not have rated shafts. In this example, the rated shaft walls would have to extend from the third level floor to the roof or Levels 1, 2, and 5 are cut off so that only 3 and 4 are open. Again,* ***the cutoff must be at the same levels throughout the building.***

The unoccupied attic level will be considered part of the upper level requiring shaft protection unless it is cut off from the upper level by a fire damper or rated cap such as in a stair enclosure roof/ceiling

(2) All doors opening into such enclosures shall be as specified in s. COMM 51.047, and all windows shall be of wired glass and metal frames and sash.

Note: See ch. COMM 18 for requirements governing the installation and operation of elevators.

COMM 54.10 TRAP DOORS AND FLOOR OPENINGS.

Every opening through any floor or through any roof used by the public or by employes shall be guarded by a substantial enclosure or rail not less than 3 feet 6 inches high. Floor openings in buildings of more than 2 stories, unless enclosed with fire- resistive enclosures as specified in s. COMM 54.08 shall be protected by fire-resistive doors as specified in s. COMM 51.047.

COMM 54.105 TOEBOARDS.

A toeboard shall be provided at the exposed edges of all elevated platforms, walks, balconies, mezanines, ramps and floor openings to prevent the fall of materials where the elevation difference is greater than 5 feet. The toeboard shall extend 4 inches above the finished floor. Where material is stockpiled to a height where the toeboard does not provide adequate protection, additional measures shall be taken to prevent the fall of materials.

(1) **EXCEPTION.** Toeboards are not required on stairways or ramps and their landings or platforms.

COMM 54.11 LIGHTING.

(1) (a) All stairways, fire escapes and exits, and the passageways leading thereto when used at night, shall be properly illuminated to facilitate egress. The intensity of illumination shall be as specified in ch. COMM 73.

(b) The level of intensity of illumination for fire escapes may be reduced to 2.5 foot candles.

(2) All gas jets or gas lights in factories or workshops where combustible material is used, shall be properly enclosed by globes or wire cages, or otherwise properly guarded.

COMM 54.12 SANITARY FACILITIES.

(1) GENERAL. The occupancies included under the scope of this chapter shall be provided with toilet rooms as outlined in this section.

All occupied buildings under the scope of Chapter COMM 54 shall be provided with sanitary facilities. The department will not as a rule require sanitary facilities in warehouses and storage buildings if normally unoccupied. However, if a warehouse has employees whose work station is the warehouse, sanitary facilities must be provided for those employees in the warehouse.

It is not always necessary to provide sanitary facilities in each building of a manufacturing complex. Depending upon the nature of the work performed in a building, the number of occupants in the building, and the proximity of another building with sanitary facilities, the department may waive the sanitary facility requirements in a specific structure. The department should be ***contacted*** *for a decision regarding the need for sanitary facilities in such buildings* ***during the design stage.***

The reference to 10 employees and 25 patrons/occupants is based on the most critical point of time. For instance, a manufacturing facility operating three shifts with 5 employees per shift would be considered as having 5 employees, not 15.

Sanitary facilities for frequenters as well as employees must be provided. This holds true particularly for retail operations. The need for sexed, separate toilet rooms or a single toilet room to serve both sexes is based on the 10 employee/ 25 occupant criteria.

The department will base sanitary facility requirements on a letter from the owner or operator stating the maximum number of employees and patrons which will be in the building at any one time. However, the ***exiting*** *requirements* ***may not be reduced*** *by means of such letter.*

Swimming pools are also regulated by Ch. Comm 90 of the Plumbing Code. It establishes maximum capacities for swimming/exercise pools, wading pools and whirlpools and requirements for associated dressing, shower and toilet facilities. The more restrictive of the two codes shall apply.

(a) The toilet rooms shall be available for all occupants and employes during all hours of operation and located as specified in sub. (2)(b) 2.

(b) Toilet rooms for employes shall be accessible and convenient during all hours of operation.

(c) Sanitary fixtures for the public shall be provided using Table 54.12-A. Sanitary fixtures for employes shall be provided using Table 54.12-B.

TABLE 54.12-A

NUMBER OF SANITARY FIXTURES REQUIRED FOR PATRONS/OCCUPANTS FOR PUBLIC BUILDINGS

Number of Patrons/Occupants of Each Sex[2]	Type of Fixture[1]				
	Water Closets (WC)				
	Males (M)	Females (F)	Urinals (U)	Drinking Facilities (DF)	Lavatories[3] (L)
1 - 100	1	1	0	One (DF) for each 150 occupants or fraction up to 600	One (L) for each 2 fixtures (WC) or (U) required or fraction
101 - 200	1	2	1		
201 - 250	1	3	2		
251 - 300	1	4	2		
301 - 350	2	5	2		
351 - 400	2	6	2		
401 - 450	2	7	3		
451 - 500	2	8	3		
501 - 600	2	9	4		
Over 600	One (WC) for each additional 600 (M) or 275 (F) or fraction		One (U) for each additional 500 (M) or fraction	One additional (DF) for each additional 3,000 occupants or fraction	

1 Showers shall be required only in public pool facilities and for occupants exposed to occupational hazards such as poisonous, infectious or irritating materials.

2 The determination of the number of each sex shall be based on equal number of each sex unless other information is made available to the department and accepted. Where a single toilet room designated as UNISEX is provided, it shall be considered as accommodating no more than 10 employes and 25 occupants.

3 A minimum of one lavatory shall be provided in each toilet room.

Note: For structures with additions or alterations, the required number of sanitary fixtures shall be the sum of the fixtures required for the existing portion at the time it was constructed plus the fixtures required by this table for the new addition or altered area. At such time as the summation of the addition and alteration area is equal to or greater than 51% of the building area calculated as specified in s. COMM 50.03(4)(d), fixtures shall be provided in conformance to this table utilizing the capacity of the entire building.

Note: See chapter COMM 69 for the percentage and design of accessible drinking facilities.

The term "patrons/occupants" is intended to be the sum of all building occupants including employees.

Tables 54.12-A and B set forth the number of sanitary fixtures required for building occupants and employees. Table A applies to all occupants of the building, which would be the sum of the employees and frequenters. Table B applies only to employees. The occupants of a building, both employees as well as frequenters, are assumed to be equally divided between males and females. Table A should be used first to determine if adequate facilities are available for each sex considering the total occupant load of the building. The sanitary facilities determined by applying Table A should then be compared to the sanitary facility requirements for employees only as set forth in Table B. If the facilities determined by Table A satisfy the requirements of Table B, fine. If the fixtures determined by Table A do not meet the requirements of Table B, additional fixtures must be provided.

As stated earlier, the occupants are considered as equally divided between sexes. The sanitary facilities required under Table B are based upon this assumption and must be provided. However, if the work force is unbalanced between sexes, additional fixtures may have to be provided to accommodate that imbalance. For instance, if a manufacturing facility has 90 employees, Table B would be entered on the line for 36-55 employees of each sex requiring two water closets and one urinal for the males and three water closets for the females. If the actual ratio in that facility is 70 females and 20 males, the facilities required for the females would be on the line indicated as 56-80 employees of each sex requiring four water closets for the females.

Question: *How does providing a barrier-free, unisex toilet room affect the number of required sanitary fixtures?*

Answer: *The biggest misconception is that the unisex toilet room is adequate for 35 persons which is not true. A single unisex toilet room is good for 25 occupants, 10 of who may be employees if permitted to use the occupant/patron toilets. If the toilet room is being provided for employees only, it will be good for only 10 more employees (example: 1 male, 1 female, 1 unisex is good for up to 225 total occupants and of those 225, up to 40 could be employees).*

TABLE 54.12-B

NUMBER OF SANITARY FIXTURES REQUIRED FOR EMPLOYES FOR PUBLIC BUILDING

	Type of Fixture[1]					
	Water Closets (WC)			Drinking		
Number of Employees of Each Sex[2]	Males (M)	Females (F)	Urinals (U)	Facilities (DF)	Lavatories[3] (L)	Showers (S)
0 - 15	1	1	0	One (DF)	One (L) for	One (S)
16 - 35	1	2	1	for each 100	each 2	for each
36 - 55	2	3	1	employees,	fixtures	10
56 - 80	2	4	2	or fraction	(WC) or	employees
81 - 110	3	5	2		(u), or	of each
111 - 150	4	6	2		fraction	sex, or
150 - 200	5	8	3			fraction
201 - 250	6	9	3			
Over 250	One (WC) for each additional 55 (M), or fraction; one (WC) for each additional 15 (F), or fraction		One (U) for each additional 75 (M), or fraction			

[1] Showers shall be provided in public pool facilities and for employes exposed to occupational hazards such as poisonous, infectious or irritating materials.

[2] The determination of the number of each sex shall be based on equal number of each sex unless other information is made available to the department and accepted. Where a single toilet room designated as UNISEX is provided, it shall be considered as accommodating no more than 10 employes and 25 occupants.

[3] A minimum of one lavatory shall be provided in each toilet room.

Note 1: For structures with additions or alterations, the required number of sanitary fixtures shall be the sum of the fixtures required for the existing portion at the time it was constructed plus the fixtures required by this table for the new addition or altered area. At such time as the summation of the addition and alteration area is equal to or greater than 51% of the building area calculated as specified in s. COMM 50.03(4)(d), fixtures shall be provided in conformance to this table utilizing the capacity of the entire building.

Note 2: Examples: Example #1: Mercantile building with 300 patrons and 50 employes = 350 total occupants; equally divided between the sexes = 175 males, 175 females. From Table 54.12-A, 101-200

occupants of each sex: males require one water closet, one urinal, one lavatory; females require 2 water closets, one lavatory. Check for compliance with Table 54.12-B for employes: 50 employes, equally divided between sexes = 25 males, 25 females; 16-35 employes of each sex, males require one water closet, one urinal, one lavatory; females require 2 water closets, one lavatory. Therefore, the number of fixtures required by Table 54.12-A also satisfies the requirements of Table 54.12-B for employes and governs.

Example 2: Office building with 300 employes and 50 patrons = 350 total occupants; equally divided between sexes = 175 males, 175 females. From Table 54.12-A, 101-200 occupants of each sex: males require one water closet, one urinal, one lavatory; females require 2 water closets, one lavatory. Check for compliance with Table 54.12-B for employes: 300 employes, equally divided between sexes = 150 males, 150 females; 111-150 employes for each sex, males require 4 water closets, 2 urinals, 3 lavatories; females require 6 water closets, 3 lavatories. Therefore, the number of fixtures required by Table 54.12-B for employes is more restrictive and governs.

Note 3: See also rules of the department of health and social services for sanitary fixtures for public swimming places, mobile home parks, camping grounds, camping resorts, recreation camps and educational camps.

Note 4: See chapter COMM 69 for the percentage and design of accessible drinking facilities.

(2) TOILET ROOMS.

(a) *Factories, office and mercantile buildings.* All factories, office and mercantile buildings shall be provided with separate toilet rooms for each sex.

Generally, the department will require that the toilet rooms provided for buildings of this occupancy be located within the building and that access to the toilet rooms be arranged such that it is not necessary for occupants to leave the building to get to the toilet rooms. Also, access routes to the toilets must be via public corridors and aisles. Access routes to the toilets requiring passage through another tenant space are not permitted. There are some exceptions to these requirements:

1. Existing service stations with exterior access toilets [permitted by COMM 52.58 (4)], where the service bays are being converted to mercantile (i.e. convenience store), and dispensing of motor fuels is being maintained, may continue to use the exterior access toilet rooms and will not be required to modify the toilets or provide new toilets for the purpose of providing interior access.

2. Multiple building event facilities (i.e. fair grounds, amusement parks, municipal and private parks, athletic fields etc.) need not provide toilets in each building provided conveniently located toilets are distributed on the grounds. As a ***guideline****, maximum travel distance to the toilet facilities should be in the range of 400 to 500 feet.*

3. Multiple building industrial sites. Sanitary facilities are required in every building that has permanent employee work locations. Facilities are not required in unoccupied storage or warehouse buildings. Facilities are not required in buildings having infrequent, short-time occupancy. An infrequently occupied building is one which is normally unoccupied but an employee visits the building to perform a task taking no more than 2 hours and then returns to his/her permanent work station.

4. Although it is not permitted for the sanitary facilities to be located within one tenant space if they are to be used for another tenant, there are occasions where separate "tenants" exist in a building, created for accounting or financial purposes, but the various "tenants" operate and give the appearance of a single operation. Examples of this type of arrangement include: an insurance or loan agency located in a retail or department store, a coffee shop located in a bakery, a video rental operation or florist in a grocery store, etc. In these cases, where the various "tenants" operate during the same hours, and/or there are no physical barriers between the "tenants" and the sanitary facilities provided, the "tenants" may share the sanitary facilities even though the facilities are located in only one of the tenant spaces

(b) *Exceptions.*

1. Where not more than 10 employes and 25 patrons are accommodated, one toilet room to accommodate both sexes shall be provided. The door of the toilet room shall be equipped with an operating lock to ensure privacy.

2. Separate toilet rooms for employes and the general public need not be provided if the toilet rooms are accessible to both employes and the general public during all hours of operation. If the toilet rooms are accessible only through the employe work area, separate toilet rooms shall be provided for the general public.

Toilet rooms are required to be available to the public without them having to go through the employee work area (i.e., directly off of the retail sales area). A public corridor may be used to access the toilet rooms. If a door is placed at the entrance to the corridor, then a sign shall be placed on the door indicating the path to the toilet rooms.

Historically, tenant spaces are submitted with the toilet rooms to the "back" of the space. Typically, this will not work when the space is developed, as the retail area will be in the front and storage/work area in back. The designer should be reminded that the toilet room will be required to be off of the "sales" area when the tenant alteration plans are submitted. The designer may also consider delaying the installation of plumbing prior to further development of the space.

3. Buildings and structures which provide service to people in automobiles, such as drive-in bank teller booths, photography and film service booths, or parking lot attendant booths, but not including drive-in restaurants, shall not be required to provide toilet rooms, provided that a written statement is submitted to the department verifying that convenient toilet facilities are available during all shifts and periods of operation. Toilet rooms are not required for mobile crews or in unattended buildings, provided the employes have access to convenient toilet facilities during all hours of operation.

Drive-up restaurants which have no inside or outside seating AND where the public are served without entering the building would NOT be required to provide toilet facilities for the public. If a vestibule area is provided for walk-up orders (i.e., the public enters the building), toilets for the public WOULD be required based on the capacity of the vestibule.

Even if no toilet facilities are required for the public, toilets must be available for employees of drive-up restaurant (note that a single unisex toilet room would be adequate if fewer than ten employees are present).

This section exempts other, small operations from the requirement to provide sanitary facilities. These operations are typically occupied by one or two employees and are arranged such that no customers enter the building. The customers would remain in their automobiles while conducting their business. At the time of plan submission or application to the local building officials for a building permit, documentation or proof of the availability of sanitary facilities for the benefit of the employees must be submitted. The available toilets are normally found in an adjoining building which must be within a reasonable distance of the structure in question and the toilets in the nearby building must be available during all hours of operation of the subject structure.

(c) *Shopping centers and shopping malls.*

1. 'General public.' Separate toilet rooms for each sex shall be provided for use by the general public in all shopping centers and shopping malls. The toilet rooms may be located in the public mall or in individual tenant spaces provided the toilet rooms are

available during all hours of operation and located as specified in par. (b) 2. A minimum of one set of toilet rooms shall be provided for the general public.

2. 'Tenant spaces and employes.'

a. Separate toilet rooms for each sex shall be provided for the employes in each individual tenant space. In tenant spaces which accommodate not more than 10 employes, one toilet room to accommodate both sexes may be provided. For an individual tenant space or an individual booth within the public mall with a net area of 750 square feet or less, toilet rooms for the employes need not be provided if the employes have access to convenient public toilet rooms located in the public mall during all hours of operation.

b. Toilet rooms for other use groups which may also be included in shopping centers or shopping malls shall be provided as specified in sub. (2)(e) and s. COMM 55.32.

Note: The department recommends that public toilet rooms in shopping centers and shopping malls be conveniently located for patron use and that the travel distance between sets of public toilet rooms be less than 400 feet. A set of public toilet rooms means one toilet room for each sex.

(d) *Places of worship and mausoleums.*

1. 'Places of worship.' Places of worship which are included under this chapter shall be provided with separate toilet rooms for each sex.

2. 'Mausoleums.' Sanitary facilities are not required for unheated worship areas of mausoleums without fixed seating or for mausoleums within cemeteries where public sanitary facilities for each sex are provided within the cemetery.

(e) *Places for entertainment, recreation and dining.*

1. Restaurants, taverns, and places for entertainment and recreation which are included under the scope of this chapter shall be provided with separate toilet rooms for each sex. Separate toilet rooms for employes and the general public need not be provided if the toilet rooms are accessible to both employes and the general public during all hours of operation.

See COMM 54.12 (3)(b) 2. for number of fixtures.

2. For mixed-use facilities such as a dinner theater, the number required for the restaurants applies.

Note: See rules of the department of health and social services, ch. HSS 196--Restaurants, for supplementary requirements for toilet room facilities in restaurants.

(f) *Garages, service stations and filling stations.* Toilet rooms shall be provided as outlined in this paragraph.

Service stations and filling stations are required to have separate toilet rooms for each sex. If gasoline or other motor vehicle fuels are dispensed to the public, the facility is considered a service station or filling station requiring separate, sexed toilet rooms. This requirement will apply to small convenience stores if gasoline or other motor vehicle fuels are dispensed.

1. 'Garages.' Separate toilet rooms for each sex shall be provided in all service and repair garages, body shops, automobile tire and battery shops, and buildings of similar use, except that a single toilet room to accommodate both sexes may be provided in buildings which accommodate not more than 10 employes and 25 patrons. If toilet rooms are accessible to

both employes and patrons during all hours of operation, separate toilet rooms for employes and patrons need not be provided.

2. 'Service stations and filling stations.' Separate toilet rooms for each sex shall be provided in service stations and filling stations, including self-service stations. If toilet rooms are accessible to both employes and patrons, separate toilet rooms for employes and patrons need not be provided.

(g) *Airports, bus terminals, train stations and other transportation centers.* All airports, bus terminals, train stations and other transportation centers shall be provided with separate toilet rooms for each sex as required in Table 54.12-A.

(3) SANITARY FIXTURES.

(a) *General.* In public buildings and places of employment, except as provided in par. (b), the total number of sanitary fixtures required in the building shall be based upon the total number of occupants of the building and shall be determined by using the higher number calculated from Tables 54.12-A and 54.12-B. The total number of occupants will be considered equally divided between males and females unless a different ratio is established by the department.

(b) *Exceptions.*

1. Except as provided in subd. 2., taverns and restaurants shall provide at least one separate toilet room for each sex.

2. Restaurants providing seating for 15 or less occupants, one toilet room having at least one water closet (WC) and one lavatory (L) may be provided to accommodate both sexes. The door of the toilet room shall be equipped with a lock to ensure privacy. If the toilet rooms are accessible to both employes and the general public, separate toilet rooms for employes and the general public need not be provided.

3. Taverns and restaurants accommodating 16 to 50 total occupants, at least one water closet (WC) and one lavatory (L) for each sex shall be provided.

4. Taverns and restaurants accommodating 51 to 100 occupants, at least 2 water closets (WC) and one lavatory (L) for female patrons and at least one water closet (WC), one urinal (U) and one lavatory (L) for male patrons shall be provided.

5. Taverns and restaurants accommodating more than 100 occupants, the number of sanitary fixtures provided shall be as determined by using Table 55.32.

Question: *May water closets be substituted for required urinals?*

Answer: *No. The required number of water closets and the required number of urinals must be provided (for public use) unless substitution is specifically allowed in the occupancy chapters. In computing facilities for employees only, water closets may be substituted for urinals.*

(c) *OSHA regulations.* The ratios for water closets established in Table 54.12-B for employes are taken directly from the U.S. department of labor occupational safety and health act (OSHA) regulations. Therefore, s. COMM 50.25, petitions for variance, is not applicable to the requirements of Table 54.12-B.

COMM 54.13 CHANGE ROOMS AND LUNCHROOMS.

(1) CHANGE ROOMS. Change rooms equipped with storage facilities for street clothes shall be provided where employes are required to wear protective clothing due to the nature of the

employment and where employes are exposed to toxic materials and industrial poisons. Separate storage facilities for street clothes and work clothes shall be provided for employes who work with industrial poisons.

Note: see also HSS 196, Wis. Adm. Code, rules of the department of health and social services, for requirements for dressing rooms and lockers in restaurants.

(2) LUNCHROOMS. A space for eating lunches shall be provided in all places of employment where there is exposure to injurious dusts, toxic material and industrial poisons. Such space shall be physically separate from any location where there is exposure to toxic materials. Toilet rooms shall not be permitted to serve as lunchrooms.

COMM 54.145 OCCUPANCY SEPARATIONS AND HAZARD ENCLOSURES.

Occupancies within the scope of this chapter shall be separated from other occupancies or uses in accordance with s. COMM 51.08. Hazards shall be enclosed in accordance with s. COMM 51.08.

COMM 54.15 FIRE PROTECTION SYSTEMS.

(1) SPRINKLER SYSTEMS. Automatic fire sprinkler systems shall be provided as outlined in ss. COMM 52.01, 52.011, 52.012 and 52.013.

(2) STANDPIPE SYSTEMS.

(a) *Fire department standpipes.* Fire department standpipes shall be provided in all buildings exceeding 60 feet in height.

(b) *Dry standpipes.* Dry standpipes as specified under s. COMM 51.21 shall be provided in all buildings 3 stories or more in height in which the floor area of each story is more than 3,000 square feet, unless an approved automatic sprinkler system is installed. First-aid standpipes may be provided in lieu of dry standpipes in factory occupancies. (See s. COMM 51.21.)

(3) FIRE EXTINGUISHERS. Portable fire extinguishers shall be provided and maintained as specified in s. COMM 51.22.

COMM 54.17 FIRE ALARMS.

(1) FACTORY AND WORKSHOP. Except as provided in sub. (3), a manual fire alarm complying with the requirements of s. COMM 51.24 shall be provided in every factory or workshop where more than 10 persons are employed above the second story.

(2) OFFICE BUILDINGS. Except as provided in sub. (3), a manual fire alarm complying with the requirements of s. COMM 51.24 shall be provided in office buildings complying with either of the following conditions:

(a) Four stories or more in height; or

(b) 15,000 square feet or more on any floor level above or below a floor of exit discharge.

(3) EXCEPTION. The installation of a manual fire alarm system may be omitted in buildings where complete automatic fire sprinkler system protection is provided.

Please note that this section specifies factory, workshop and office uses only. This section does not require fire alarms to be installed in retail or mercantile uses.

COMM 54.18 FLOOR LOAD SIGNS.

(1) In every factory, workshop, warehouse, or other building where material is piled, notices of a permanent character shall be painted or otherwise prominently displayed, stating the live load in

pounds per square foot which the floor is designed to carry. Such notices shall be placed in full view, on each floor.

(2) Where floors are always used for the storage of some particular material, the walls shall be marked to the height to which the material shall be piled without exceeding the safe load.

COMM 54.19 SIGNS INDICATING NUMBER OF PERSONS.

In all buildings of this classification where 50 or more persons are accommodated on any floor above the second, notices shall be prominently displayed stating the maximum number of persons on each floor for whom stairways and other exits have been provided according to ss. COMM 54.02-54.06. Such notices shall be placed in full view, on each floor.

COMM 54.20 NO SMOKING SIGNS.

Smoking shall not be permitted in retail establishments where flammable materials are handled or sold. Suitable signs bearing the words "No Smoking" shall be erected in all places where such hazard exists.

COMM 54.21 TENTS.

All tents used for sales or storage purposes shall conform to the requirements specified in ss. COMM 62.42-62.51.

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Chapter COMM 55

THEATERS AND ASSEMBLY HALLS

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COMM 55.001 SCOPE.

The requirements of this chapter shall apply to all theaters and assembly halls.

Two criteria must be met in order for a building or occupancy to be classed as a theater or assembly hall. Both of the criteria must be met. First, the building must have an occupant load in excess of 100 persons. Second, those people must be in the building primarily for the purpose of entertainment, recreation, worship or dining. If either criteria is missing, the building is not a theater or assembly hall.

The most critical use of the building will determine its occupancy classification.

An employee cafeteria in a building even though it may hold over 100 people is not considered an assembly hall as the employees are in the building primarily to work, not primarily to dine. Also, a courtroom even though it may have a seating capacity in excess of 100 is not considered an assembly hall due to the absence of the entertainment, recreation, worship or dining criteria.

Church Sunday School classrooms are considered part of a place of worship. However, if the classrooms are also used to operate a parochial day school, they will fall under the scope of COMM 56.

Funeral homes are considered a place of worship.

Designers of large exhibition buildings which would normally fall under the scope of Chapter COMM 54 should be concerned with other uses of the building. If, at times, the exhibition building is used for the purposes of entertainment, recreation, worship or dining, the building must be designed in accordance with the requirements of Chapter COMM 55 for that use and Chapter COMM 54 for its exhibition building use. Where the requirements of the two chapters conflict, the more restrictive will apply.

Note: For assembly areas in connection with schools and other places of instruction, refer to ch. COMM 56.

COMM 55.01 DEFINITIONS.

In this chapter:

(1) "**Assembly halls**" or "**places of assembly**" mean all buildings, or parts of buildings, other than theaters, which will accommodate more than 100 persons for entertainment, recreation, worship or dining purposes.

Note: Assembly halls or places of assembly which will accommodate not more than 100 persons are included within the scope of ch. COMM 54.

(2) "**Theaters**" means all buildings or parts of buildings, containing an assembly hall, having a stage which may be equipped with curtains or permanent or movable scenery, or which is otherwise adaptable to the showing of plays, operas, motion pictures or similar forms of entertainment.

COMM 55.02 CLASS OF CONSTRUCTION.

(1) GENERAL. The capacities of buildings or parts of buildings in this classification for the various types of construction shall not exceed, and shall comply with, the following requirements:

MAXIMUM CAPACITIES

Class of Construction	Without Complete Automatic Fire Sprinkler System Protection		With Complete Automatic Fire Sprinkler System Protection	
	With Stage	Without Stage	With Stage	Without Stage
Type 1 and 2	No Limit	No Limit	No Limit	No Limit
Type 3 and 4	750	1,500	1,000	2,000
Type 5 and 6	500	1,000	750	1,500
Type 7 and 8	300	750	500	1,000

Designers of new assembly halls should consider the possibility of future expansion. If the potential exists for future expansion and if that future expansion will bring the capacity to a level requiring a construction classification higher than that proposed for the original building, consideration should be given to construction of the original building at the higher construction classification. This will eliminate the need to upgrade the construction classification of the original building at the time of future expansion.

(2) UNLIMITED CAPACITY BUILDINGS. Buildings of type 3, 5 or 6 totally noncombustible construction, or type 4 construction, may have unlimited capacities provided:

(a) The building does not exceed one story in height;

(b) The floor framing and its supports for any mezzanine is constructed of noncombustible materials with at least a one-hour fire-resistive rating; and

(c) Any basement or ground floor is:

1. Separated from any upper floor level by noncombustible construction with at least a 4-hour fire-resistive rating; and

2. Used only to accommodate mechanical equipment.

This provision to allow unlimited capacity is an alternative method to construction of a fire-resistive building. If this method is utilized to obtain unlimited capacity, it must be remembered that the building is not fire-resistive and the aggregate exit width will be based upon the requirement for Types 3 through 6 construction.

(2M) TYPE 7 AND 8 CONSTRUCTION. (See s. COMM 51.03.) Where buildings of these classifications are erected of type 7 or 8 construction, the following restrictions shall apply:

(a) Located at least 20 feet from any other building or adjoining property line, except for those buildings as permitted under par. (c) 4.;

Additions to Types 7 and 8 buildings. *If an addition is constructed on an existing Type 7 or 8 building in accordance with the exceptions listed in 55.02 (2m)(c) 4., the building will be considered a Chapter 54 occupancy. Therefore, the 20-foot setback indicated under (a) will not apply. The 20-foot setback applies to Type 7 or 8 buildings under the scope of Chapter 55. The setback requirements of COMM 51.03 (7) and (8) will apply and, as a Chapter 54 occupancy, the building must meet area limitations as specified in COMM 54.01. See COMM 51.03-A commentary on allowed encroachments.*

(b) Is not built in connection with a building used for any other purpose, unless the assembly hall is separated from the other building by a fire-division wall as specified in s. COMM 51.02 (13); and

The department will allow day cares or schools operated by or for a church to be built in connection with a church without a 4-hour fire separation. Also, COMM 51.08, Footnote f, allows this without an occupancy separation.

(c) Except as provided in subds. 1. to 5., not more than one story in height and limited to one floor level.

This code section basically states that theaters and assembly halls of wood frame (Type 7 or 8) construction are ***limited to only one floor level.*** *The building cannot have a basement, ground floor, mezzanine or balcony. Five exceptions to the one-level restriction are included under (c) of this section of the code. If an assembly hall or theater of wood frame is desired with more than one floor level, one of the five exceptions must be utilized. Each of the five exceptions is an* ***independent exception****; therefore, the provisions found under one of the five exceptions will not apply to any of the other exceptions.*

1. Exception. A basement or ground floor heating and fuel room enclosed with fire-resistive construction as specified in s. COMM 51.08, with all interior openings protected with self-closing fire-resistive door assemblies as specified in s. COMM 51.047 will be permitted.

2. Exception. A place of worship may have:

a. A full basement or ground floor; and

b. A balcony or mezzanine which has at least one side open to the floor below and which has a maximum occupancy of 30 persons.

3. Exception. One-story and ground-floor assembly halls of Type 7 or 8 construction will be permitted providing the following conditions are satisfied:

a. Both levels shall exit directly to grade. One exit stair from the lower level up to the exit discharge grade is permitted providing the stair is enclosed to the outside by 2-hour fire-resistive rated construction;

b. The ground story exterior walls shall be of masonry or concrete;

c. The lower level shall be separated from the upper level by 2-hour noncombustible fire-resistive rated construction or better. The first floor supports shall also be of 2-hour noncombustible fire-resistive rated construction;

d. All stairways shall be enclosed by at least 2-hour fire-resistive rated enclosures;

e. The maximum capacity of the building is limited as specified in sub. (1); and

f. All other requirements of ch. COMM 55 are satisfied.

4. Exception. Additions to existing buildings of Type 7 or 8 construction having a basement or second floor, or both, will be permitted under the scope of ch. COMM 54 providing the following conditions are satisfied:

a. The building contains no other occupancy except the owner's private residence;

b. Public occupancy is prohibited in the basement and second floor;

c. The addition does not contain a basement, second floor or ground floor;

d. The public occupancy areas are divided by partitions, dividers and similar objects into definable areas having a maximum capacity of 100 occupants each. Each definable area shall have 2 independent, remote exits to the outside;

The construction elements separating the building into areas having a capacity of 100 or less ***must be permanent.*** *Partial and full height walls, planters and other similar construction elements which occupy at least 50 percent of the opening between areas are acceptable. Demountable partitions, folding partitions and folding doors are not acceptable as they are not permanently in place to divide the areas.*

e. The maximum capacity of the building is limited as specified in sub. (1);

f. All other requirements of ch. COMM 54 are satisfied; and

g. This exception does not apply to buildings originally constructed within 5 years of submissions of plans for the addition.

5. Exception. Buildings completely protected by automatic fire sprinkler system protection may not exceed 2 stories in height and shall be limited to 2 floor levels.

(3) BALCONIES ACCOMMODATING MORE THAN 100. In any theater or assembly hall, balconies which accommodate more than 100 persons shall be Type 1 or 2 construction as specified in s. COMM 51.03.

COMM 55.03 HEIGHT ABOVE GRADE.

THEATERS. The height of the sills of the principal entrance doors to any theater, as defined in s. COMM 55.001, shall be not more than 18 inches above the outside grade at that point. The floor level at the highest row of seats on the main floor shall not be more than 6 feet above the outside

grade at the main entrance; the floor level at the lowest row of seats on the main floor shall be not more than 6 feet below, or above, the grade at the nearest exit.

The main floor of a theater must be on the first story of the building and no portion of the main floor auditorium may be more than 6 feet above or below exit discharge grade. This applies only to theaters and does not apply to other occupancies under the scope of Chapter COMM 55.

COMM 55.04 EXPOSURE AND COURTS.

(1) Every theater or assembly hall which accommodates more than 600 persons shall have at least 3 walls abutting on streets, alleys, or open courts.

(2) The wall containing the main entrance to any theater or assembly hall shall abut on a street. The lobby or passageway leading from the main entrance doors to the foyer or auditorium shall be direct and unobstructed and of a minimum width equal to the sum of the widths of the main entrance doors. There shall be no openings from other occupancies to such a corridor or passageway.

The main entrance to any theater or assembly hall must be in a wall which faces a street. Street is defined by COMM 51.01 (124) and is not limited only to public streets and thoroughfares. The street may be a parking lot.

(3) The width of every exit court shall be at least 6 feet for an occupancy not exceeding 500 persons, and shall be increased at the rate of one foot per each 500 persons additional. Every such court shall lead to a public thoroughfare, either directly, or through a passageway of equal width, not less than 8 feet high enclosed with unpierced 4-hour fire-resistive walls, ceiling and floor as specified in s. COMM 51.04. The floor and ceiling shall be designed for a live load of not less than 150 pounds per square foot. No such court, or passageway shall be used for storage or any other purpose whatsoever.

COMM 55.05 OCCUPANCY SEPARATIONS AND HAZARD ENCLOSURES.

Occupancies within the scope of this chapter shall be separated from other occupancies or uses in accordance with s. COMM 51.08. Hazards shall be enclosed in accordance with s. COMM 51.08.

*As indicated in COMM 55.08, horizontal exits are **not** permitted to serve assembly hall occupancies. When determining the location of occupancy separation elements, designers must ensure that the exit paths for the theater or assembly hall are located on the Chapter COMM 55 side of the occupancy separation.*

*Individual small taverns and restaurants, each having a capacity of less than 100 and separated from each other by solid walls, will **not** be considered as a Chapter COMM 55 occupancy even if the combined capacities exceed 100. This is typically found in shopping centers having several small fast food outlets. They will be individually reviewed under the scope of Chapter COMM 54. However, if a common dining area is provided to serve two or more such establishments such as a shopping center food court and if the capacity of that common area exceeds 100, it is considered a Chapter COMM 55 occupancy requiring separation from the balance of the shopping center. In this case, however, the individual fast food outlets, although COMM 54 occupancies, need not be separated from the common dining area.*

Also, capacity of adjacent tenant spaces utilized for dining, recreation, or worship shall be cumulative if occupants can move directly between the spaces without utilizing the mall corridor.

COMM 55.06 CAPACITY.

(1) Table 55.06 includes the various types of occupancy within the scope of this section, together with the method to be used in determining the capacity.

Capacities are based upon the table indicated square feet per person. The department will allow some exceptions to this requirement. If fixed seating is provided such as in theaters, auditoriums and church sanctuaries, the capacity will be based upon the number of fixed seats. Capacities for restaurants and taverns can be based upon the furniture layout provided that layout is submitted with the plans and deemed by the department to be reasonable. This will apply only to the main dining rooms and is not applicable to banquet or party rooms. Banquet or party rooms will have the furniture configured to meet the desire of the person utilizing the room. Therefore, due to the variety in seating arrangement, capacity must be based upon the square feet per person indicated by the table.

Question: *Is it possible to post a building to limit its capacity?*

Answer: *Consider two situations:*

1. An existing building undergoes a change of use or alterations which may potentially increase the occupant capacity is already limited due to existing conditions such as class of construction, available aggregate exit width, sanitary facilities, limitation on basement or second floor capacity, ventilation provided, thus the square footage of the space is not a consideration for existing building capacity. Existing buildings may be posted to limit the occupant load to correspond to the most restrictive code requirements of the existing conditions.

2. For new buildings, the maximum capacity is calculated based on square footage, then the building is designed to satisfy the other requirements. Likewise, additions to existing buildings should be designed to satisfy code requirements for the entire building based on capacity determined from net square footage or other methods acceptable to the department such as fixed seating, etc.

Existing buildings may be posted to restrict occupant load to correspond to the most restrictive requirements. New buildings and additions cannot be posted for less than full capacity based on net square footage or other methods acceptable to the department.

Toilet rooms and required exit corridors which must be kept free and clear at all times will be considered as unoccupied spaces.

(2) No greater number of persons than the number thus established shall be permitted in any theater or assembly hall.

See Shopping Mall Informational Bulletin *in the Design Supplement at the end of this book.*

COMM TABLE 55.06
OCCUPANCY CAPACITY

Use or Occupancy	Basis of Capacity
(a) Arenas and field houses	4 square feet per person use seated areas only
(b) Assembly halls, with stage	7 square feet per person
(c) Banquet halls	10 square feet per person
(d) Churches (auditoriums)	7 square feet per person
(e) Churches (dining rooms)	10 square feet per person
(f) Dance halls	10 square feet per person
(g) Dining rooms	10 square feet per person
(h) Gymnasiums	6 square feet per person for seated space 15 square feet per person for unseated space
(i) Lecture halls	7 square feet per person
(j) Lodge halls	6 square feet per person for seated space 15 square feet per person for unseated space
(k) Skating rinks	45 square feet per person
(l) Theaters	7 square feet per person
(m) Theater lobbies .	7 square feet per person
(n) Swimming pool rooms	10 square feet per person for deck area

(3) The capacity of theaters and theater lobbies must be combined to determine the theater capacity.

(4) (a) Every theater or assembly hall having movable seats shall display a sign stating the maximum number of persons permitted by code.

1. The sign shall be placed in a conspicuous place at the main entrance to each theater or assembly hall.

2. The sign shall have the following wording: "Limit (Number) Persons." The maximum number of persons shall be determined by the capacity as permitted by sub. (2) and s. COMM 55.12. The lettering shall be white on a dark background. The letters shall be not less than 1 1/2 inches in height and the number shall be not less than 3 inches in height.

COMM 55.07 NUMBER AND LOCATION OF EXITS.

(1) (a) Except as provided in par. (b), every floor and balcony of a theater and assembly hall shall be provided with not less than 2 exits, placed as far apart as practicable and so located that if any exit is blocked, some other exit will still be available from every part.

Two guidelines are applied with respect to exit distribution. First, exit or exit access doors, in order to be considered as two exits or exit accesses, must be located at least 20 feet apart. Second,

the exit or exit access points should be spaced a distance apart equal to or exceeding one-half the diagonal measurement of the space served by those exits or exit accesses.

Exiting for floor levels occupied only by employees may have exiting based upon COMM 54 requirements. This will allow for instance, a 3,000 square foot basement utilized for storage only to have a single exit. In all cases if the public or patrons are allowed on a floor level, the exiting provisions of Chapter COMM 55 will apply.

(b) A balcony accommodating not more than 30 persons in places of worship may be served by one exit.

This allowance of a single exit applies only to balconies. It does not apply to mezzanines. A balcony must be open to the floor level below as indicated in 51.02 (11)(b) 2. commentary.

(2) Where more than 600 persons are accommodated, there shall be at least 3 exits and where more than 1,000 persons are accommodated, there shall be at least 4 exits.

(3) Exits shall be distributed on all sides which adjoin streets, alleys or open courts.

Plan submittal will be required for elevated scorers' booths built in connection with a high school or college grandstand because they are connected with and usually set on top of bleaches and/or grandstands. One standard exit stairway will be permitted if the floor area of the elevated platform is less than 750 square feet. These stairways may terminate on the bleacher or grandstand and need not terminate at grade. The class of construction height limitations will not be applied to these elevated platforms.

COMM 55.08 TYPE OF EXITS.

(1) The required exits from any part of a theater or assembly hall shall be exit doorways, stairways or ramps.

Horizontal exits are not permitted. Except as provided under (3), fire escapes are prohibited.

(2) All exits to grade from a higher or lower level shall be stairways or approved ramps. In all theaters and in assembly halls having a capacity of more than 400 persons, where the exit rise is not more than 3 feet approved ramps shall be used. By approved ramp is meant an incline located inside the building and having a slope of not more than one foot of rise in 8 feet.

The need to provide a ramp to overcome an elevation difference of 3 feet or less is based upon the number of people who will use that ramp as an exit. It is not necessarily based upon the entire capacity of the theater or assembly hall. You are reminded that you ***may not divide the capacity*** *of an area* ***by the number of exits*** *provided to determine the number of people using an exit. If an area of the building has a capacity of more than 400 persons and if one or more of the exits involve overcoming an elevation difference of 3 feet or less, ramps must be provided.*

Question: *What is the significance of the word rise in s. COMM 55.08 (2) - Where the exit rise is not more than 3 feet, approved ramps shall be used? Why are ramps to be used only when the RISE is not more than 3 feet - shouldn't this actually be ANY DIFFERENCE IN ELEVATION (whether up or down)?*

Analysis: *The 1914 code stipulated theaters only were subject to this requirement. The original intent* ***may*** *have been to only address exiting from pitched or sloped floors in assembly halls with stages or subgrade theater areas exiting to a higher grade. Typically, in older theaters one entered*

at the main lobby and traveled down a sloped theater floor to the seating area. Exits at the side stage doors or the main lobby were at a higher level than the seating area.

The rationale for the 400-person criteria is that exiting an area with a large number of people in a panic situation is better accomplished with ramps where there are small elevation changes. The limited ability to see a short flight of stairs in a large mass of people makes ramps a safer way to egress larger numbers of persons.

If ramps were required everywhere in assembly occupancies, impractically long ramps would be required. Therefore, requiring ramps for differences in elevation of not more than 3 feet is a practical limit.

The use of the word "rise" (implying to a higher level) after stating "exits to grade from a higher or lower level" can be explained by use of the word "rise" to describe changes in elevation on stairs (regardless of direction of travel). Viewed in this way, the word "rise" means "changes in elevation."

Answer: Ramps shall be used for any change in elevation of not more than 3 feet in any area of an assembly hall that has a capacity of more than 400 persons.

This ramping requirement also applies to changes of elevation of less than 3 feet within enclosed stairways (as no exception from this provision is made in COMM 55.08 for enclosed stairs). Ramps within enclosed stairs would be needed where less than 3 feet elevation change occurs between floor to floor, floor to landing, or landing to landing, where the occupant load using the enclosed stair as an exit exceeds 400 persons.

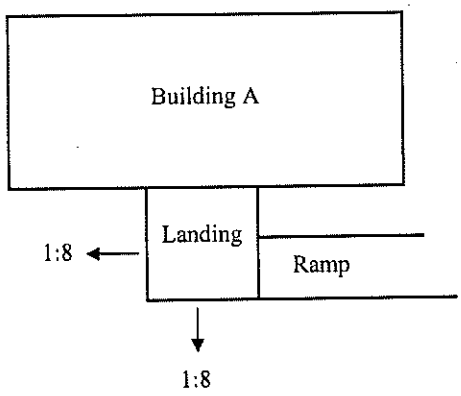
(3) Stairway exits shall be interior stairways, or smokeproof towers as specified in s. COMM 51.17; except that "B" type fire escapes may be used as exits from balconies for not more than one-half the required exit width, if located against blank walls.

(4) All ramps for barrier-free public access to a building, including nonrequired ramps, shall be inside the building.

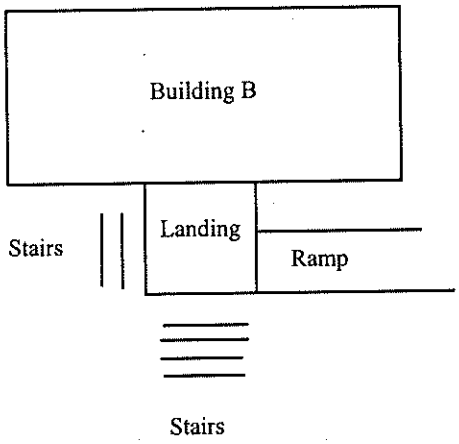
***All stairway** exits and **ramps** which are used as exits, whether required or not, **must be inside** the building. Exterior stairs, ramps and stoops are not permitted. If an exit is used only by employees and is not an exit required to serve the patrons, the provisions of COMM 54 may be used and exterior steps permitted. An example of such a location would be the exit from the kitchen which, by virtue of COMM 51.167 prohibition against public exiting through kitchens, would be used only by the kitchen employees. Exterior steps would be permitted in this instance.*

***Question:** Must all ramps used in association with assembly halls be inside the building?*

***Analysis:** The intent of requiring stairways and ramps serving an assembly hall to be inside the building is to provide weather protection for a large number of people **transversing** a means of egress with changes in elevation. Once the building has been exited and the occupants can disperse in at least two directions at grade (slope of 1:8 or less), exterior ramps and steps may be used as part of the landscape features for site access. Consider the two examples below.*



***For Building A**, the point of exit is actually the landing because two at-grade directions of travel are provided. It would be considered that you have exited the building prior to reaching the ramp, thus the ramp is more a part of the landscape not needing to be inside the building.*



***In Building B**, two directions of travel exclusive of the ramp are provided. However, since grade has not been reached, the ramp and the stairs could be used for exiting, thus all must be inside the building. Also, a primary exiting concern is with a raised ramp which would provide exiting hazards. A walkway that is flush with grade on both sides (but because its slope is greater than 1:20, is considered a ramp) is not considered necessary to be inside the building. To be at grade, the walk/ramp needs two sides with adjacent terrain sloping less than or equal to 1:8. The adjacent terrain must also lead to a street, alley, or open court.*

***Answer:** No. Once the point of exit discharge to at least two directions of travel **at grade** has been reached, additional ramps or steps are not considered as part of the building, thus do not have to be inside the building.*

***See Shopping Mall Informational Notice** in the Design Supplement at the end of this book.*

(5) Exterior stairs may be used as required exits from exterior decks for seasonal recreational facilities.

The intent of this section is to allow exterior stairs or exits from decks when snow and ice is not present. Also, the decks may not be required exits from the assembly use within the building.

COMM 55.09 STAIRWAYS.

(1) Every stairway in a theater or assembly hall shall be enclosed as specified in s. COMM 51.18 with the following exceptions:

All stairways in theaters and assembly halls, unless specifically exempted by other sections of the code, must be enclosed. Stairways which serve as required exits must be enclosed per COMM 51.18. Stairways which are not required as exits must be enclosed to provide floor-to-floor cutoff but are not required to be enclosed to an exterior door.

Stairways negotiating differences in elevation of less than 3 feet, whether used as exit stairways or not, do not require fire rated enclosures.

(a) Monumental stairways from the main floor to the first balcony need not be enclosed provided the balcony is served by additional enclosed stairways as specified in ss. COMM 51.02 (11) and 55.07.

Since additional enclosed stairways are provided, the monumental stairs is a nonrequired stairs, thus may be cut off as required by COMM 51.02 (11), but not enclosed to the outside as required by COMM 51.18.

(b) 1. In a place of worship, a monumental exit access stairway from the main floor to the first balcony having an occupant load of not more than 30 persons need not be enclosed.

2. In a place of worship, a monumental exit access stairway from the main floor to the first balcony having an occupant load of 31 to 100 persons need not be enclosed provided the balcony is served by an additional open stairway.

3. In a place of worship, stairways from the main floor to the first balcony having an occupant load greater than 100 persons shall be enclosed to the outside as specified in ss. COMM 51.02 (11) and 51.18.

4. Stairways from the basement to the first floor of a single story place of worship need not be enclosed if they lead directly to the exits.

These provisions can be combined to permit an open stairway from the basement to the first balcony without enclosure.

The unenclosed stairway must lead directly to an exit. The intent of this rule is that when one reaches the floor of exit discharge, the exterior exit will be readily visible and in close proximity to the stair.

(2) Stairways and steps which have more than 3 risers shall have handrails on both sides.

(3) Less than 3 risers may be used to elevated altars, podiums and similar areas in churches provided the elevated area is not part of a required exit passageway.

Note: See s. COMM 51.16 for general stairway requirements.

COMM 55.10 EXIT DOORS AND DOORWAYS.

(1) Every required single exit doorway shall contain a standard exit door as specified in s. COMM 51.15, except:

(a) No single door or leaf of a double door may be more than 3 feet 6 inches wide and multiple door panels may not be hinged together; and

(b) Rolling, sliding and overhead types of doors or gates may be used as standard exit doors for tenant spaces in malls provided:

1. The door or gate is equipped with exit hardware in accordance with s. COMM 51.15 (3);

2. The door or gate is counterbalanced such that it can be opened by a force not exceeding 12 pounds, or, if the door or gate is electrically operated, the door is supplied by an emergency power source capable of opening the door or gate;

3. The door or gate is maintained in a fully opened position during the business hours of the tenant space;

4. A security device permitted by s. COMM 51.15 (3) (e) 2. is not engaged when the tenant space is occupied; and

5. Manual, chain hoist operators for the doors or gates are not employed.

(2) Sills at all exit doorways shall be level and flush with adjacent inside and outside floors and ramps. Where an aisle or passageway leads to an exit from either side of the exit doorway there shall be a level floor space at the doorway extending the width of the aisle and the doorway.

The elevation of the floor on the inside of the exit door shall be at the same elevation as the floor or sidewalk on the outside of the exit door. A typical door threshold can be provided and the exterior surface can be slightly pitched for purposes of water drainage. The pitch, however, cannot be so great as to defeat the intent of a level surface. Typically 1/4 inch/foot slope is acceptable as level.

COMM 55.11 EXIT LIGHTS.

All required exits, except those in church auditoriums, shall be identified by an approved exit light. Directional exit lights shall be provided to direct occupants to the exits. Exit lights and directional exit lights shall be as specified in s. COMM 51.15 (5).

Exit lights are not required in the church auditorium or sanctuary. However, if the church is built in conjunction with a parochial day school and if the day school operation uses the church sanctuary in conjunction with the school program (i.e., chapel or school programs), exit lights are required.

COMM 55.12 REQUIRED EXIT WIDTH.

(1) The total required exit width from a building level shall be in accordance with the requirements of ss. COMM 51.15 (6) and 51.16(3).

Question: *What is the minimum passageway width for a Chapter 55 use?*

Answer: *At a minimum, COMM 54.07 requirements are applicable during periods of nonassembly use (i.e., office, practice, preparation, cleaning, etc.). COMM 55.14 specifies aisle widths. Corridors serving aisles shall be evaluated for aggregate exit width and in no case be reduced below the aisle requirements.*

(2) In theaters, the width of the front entrance shall be not less than 1/3 of the total required exit width.

COMM 55.13 SEATING.

All chairs, seats and benches used for the purpose of assembly seating shall conform to the requirements of subch. V, Assembly Seating Facilities, of ch. COMM 62.

Question: *What is the required exit width to be applied to assembly halls with assembly seating? Subject code section refers to COMM 62. COMM 62.75 (4)(b) indicates a required exit width of*

22"/100 persons. COMM 55.12 refers to COMM 51.15 (6) and 51.16 (3) which require aggregate exit widths of 30" to 50", based on construction and fire protection.

Analysis: *COMM 55.12 states that COMM 51.15 (6) and 51.16 (3) are to be applied to the building. COMM 62.75 (4)(b states that the exit width required off of the seating shall be not less than 22"/100 persons. Therefore, COMM 62.75 is to be applied only to the seating, and COMM 51.15 and 51.16 are to be applied to the room in which the seating is located and the building proper.*

Answer: *When designing buildings with assembly seating, such as gymnasiums, churches, theaters, etc., apply COMM 62.75 only to the seating area. COMM 51.15 and 51.16 shall be applied to the room in which the seating is located and the building. For buildings such as stadiums, grandstands and sports arenas, the point at which the seating stops and the building begins will be determined on a case by case basis, usually at the preliminary design review stage.*

COMM 55.14 WIDTH OF AISLES.

(1) Aisles having seats on both sides shall not be less than 2 feet 10 inches wide at the beginning and shall increase in width toward the exits at the rate of 1/4 inch per foot of run; or the aisle may have a uniform width not less than the average width of the foregoing calculation. No wall aisle shall be less than 3 feet wide and no other straight aisle shall be less than 3 feet 6 inches wide.

(2) There shall be a cross aisle leading to each required side exit. Cross aisles shall not be less than 6 feet 8 inches back to back of adjacent rows of seats.

Check also for the requirements of Ch. 70 Subchp. V, Assembly Seating Facilities.

COMM 55.15 LOBBIES AND FOYERS.

The width of lobbies and foyers shall be determined on the same basis as required for exits in s. COMM 55.12, but shall in no case be less than 5 feet wide, and shall be so designed and apportioned as to prevent congestion and confusion. Lobbies and foyers which serve as means of egress shall be at least equal in combined width to the required width of the stairways, passageways, aisles or exit doorways leading to them.

COMM 55.16 INCLINES AND AISLE STEPS.

(1) To overcome any difference in level between courts, corridors, lobbies, passageways or aisles required, or used, in egress from a theater or an assembly hall, approved ramps as specified in s. COMM 55.08 shall be employed where the difference in elevation does not exceed 3 feet, except that this requirement need not apply to balconies.

This requirement will apply only where the exit serves more than 400 persons.

(2) Steps in balcony aisles shall extend the full width of the aisle and shall have a uniform rise and run as specified in s. COMM 55.09. No handrails will be required.

COMM 55.17 OBSTRUCTION.

(1) All lobbies, aisles, passageways and doorways shall be kept free from furniture, drapes, display equipment, merchandise, vending machines and other obstructions, and no person except an employe shall be allowed to stand in or occupy, any of the aisles, passageways, corridors or lobbies during any performance or public gathering. Except that patrons may be allowed to wait in a lobby or similar space if such use does not encroach upon the required clear width of the exits. Such waiting shall be restricted to areas separated from the required exit ways by fixed

railings not less than 42 inches high. In entrance lobbies only, the exit space may be divided by railings not less than 36 inches high set up in the direction of travel in an approved manner for the regulation of ingress and egress.

(2) A booth or counter for the sale of package merchandise may be placed in the lobby or foyer of a theater where there is sufficient excess space so that the front of the booth or counter can be located not less than 5 feet back of the line marking the width of the lobby or foyer required for exit purposes.

COMM 55.18 MIRRORS AND FALSE OPENINGS.

(1) No mirror shall be placed in any part of a theater or assembly hall used by the public for exit purposes, including lobbies, corridors, stairways, ramps or any other exit facility. Where a mirror is used in an auditorium, it shall be placed flush with the wall and with the bottom at least 7 feet above any floor, balcony, gallery or platform.

(2) No false opening or decorative device giving the appearance of a door or window, where none exists, shall be placed in any part of a theater or assembly hall used by the public.

COMM 55.19 DECORATIONS.

Fabric decorations used in theaters and assembly halls shall be flame proof.

*Enclosures for elevator and vent shafts where enclosure of such shafts is required must be of not less than 2-hour fire-resistive construction. The enclosure requirement does not apply if the code permits unenclosed stairs and shafts such as the exceptions for places of worship specified in COMM 55.09 and **51.02 (11) specific exceptions** for open balconies, etc. Also see COMM Table 51.03 and the elevator code COMM 18 for additional requirements.*

COMM 55.21 STAGE SEPARATION.

(1) In every theater and assembly hall the stage shall be completely separated from the auditorium by a proscenium wall of 4-hour fire-resistive construction as specified in s. COMM 51.04, except as follows:

(a) In theaters and assembly halls having a capacity not exceeding 500 persons, the proscenium wall shall be of 2-hour fire-resistive construction as specified in s. COMM 51.04, or better.

(b) In theaters and assembly halls an open stage or platform will be permitted without the proscenium wall separation from the auditorium, provided the stage or platform is not more than 6 feet higher or wider than the proscenium opening.

The intent of this section is to omit the proscenium where stage scenery cannot be stored out of view of the audience. Therefore, the department will not permit closure of the opening between the stage and the audience by means of curtains, scenery flats or other means whereby a scenery loft is created or scenery storage area is created at the sides of the stage.

COMM 55.22 PROSCENIUM WALL.

(1) The proscenium wall shall extend from an incombustible foundation, or from the lowest fireproof floor below the stage floor, to the highest adjoining roof, except that where a 4-hour fire-resistive wall is required it shall extend at least 2 feet above the highest adjoining roof.

(2) There shall be not more than 2 openings in the proscenium wall below the level of the auditorium floor, and not more than 2 openings other than the proscenium opening, in the

proscenium wall above the level of the auditorium floor, except that in addition to the above openings there may be one opening to provide access through the proscenium wall to the orchestra pit.

(3) Each such opening shall be protected by fire-resistive door assemblies as specified in s. COMM 51.047.

COMM 55.23 PROSCENIUM CURTAIN.

Where a proscenium wall is required for the separation of a stage from an auditorium, the proscenium opening shall be provided with a curtain as approved by the department.

COMM 55.24 AUTOMATIC SMOKE OUTLET.

Where a fireproof proscenium curtain is required, or provided, the stage shall be provided with one or more automatic smoke outlets, constructed of metal or other incombustible material, placed near the center and above the highest part of the stage, and having a combined area equal to not less than 8% of the area of the stage floor. Vertical louver openings shall be placed not less than 3 feet above the roof and shall be not less than twice the area of the shaft. The smoke outlet shall be designed and constructed so as to open by gravity, and so as to effectively overcome the effects of neglect, rust, dirt, frost, snow, heat, twisting, or warping of the frame work. The louvers, or dampers in the openings shall be held closed by cotton or hemp cords running to the stage floor close to each stage door. Fusible links, or other approved heat release devices, shall be inserted in each cord near the outlets.

The specification for cotton or hemp cords is a holdover from early theater design. Other manual release devices may be utilized if approved by the department.

COMM 55.25 STAGE VESTIBULES.

All entrances to the stage shall be vestibuled in such manner as to protect the curtain, scenery, and auditorium from drafts of air.

This section will apply if a proscenium wall is required.

COMM 55.26 FOOTLIGHT TROUGH.

The footlight trough shall be made of, or lined with, incombustible material.

COMM 55.27 FIREPROOF PAINT.

All stage scenery, properties, curtains, and decorations made of combustible material, and all woodwork in or about the stage, shall be effectively flame-proofed.

COMM 55.28 STAGE ACCESSORY ROOMS.

(1) All property rooms and other storage or workrooms shall be built of noncombustible material throughout, and shall be separated from the stage by 4-hour fire-resistive rated construction.

(2) All dressing rooms shall be separated from the stage by 2-hour fire-resistive rated construction. No dressing room or employes' room may be placed more than one story below the grade line, and no dressing room may be placed above or below the auditorium unless separated therefrom by 2-hour fire-resistive rated construction.

COMM 55.30 LIGHTS AND LIGHTING.

(1) Electric lights shall be used for lighting where electric current is available. No oil lamps or other open lights shall be used in or about any stage containing scenery.

(2) No gas lighting of any kind shall be used on any stage containing scenery, nor in any property room, storage room, scene dock, or fly gallery, except in localities where electricity is not available.

(3) In all theaters and assembly halls, all stairways, passageways, and exit doors shall be properly lighted and shall remain lighted throughout every performance or entertainment and until the audience has left the building.

COMM 55.32 SANITARY FACILITIES.

(1) TOILET ROOMS. All occupancies included under the scope of this chapter shall be provided with separate toilet rooms for each sex. Separate toilet rooms for the employes and the general public need not be provided if the toilet rooms are accessible to both the employes and the general public.

(a) *Toilet rooms in connection with stage.* In theaters and assembly halls which are equipped for the showing of stage productions, separate toilet rooms for each sex, furnished with at least one water closet and one lavatory, shall be provided in connection with the stage.

(b) *Toilet room in connection with motion picture booth.* In theaters where motion picture machines are run continuously for a period of more than 2 hours without at least 10 minutes intermission for the motion picture machine operator for each 2-hour period, a toilet room, furnished with one water closet and one lavatory, shall be provided in direct connection with the motion picture booth.

(2) SANITARY FIXTURES. The number of water closets, urinals, lavatories and drinking facilities required for the total number of occupants of each sex shall be determined in accordance with the ratios established in Table 55.32, but in no case shall the ratio of the number of fixtures to number of employes be less than those specified in Table 54.12-B. The total number of occupants will be considered equally divided between men and women unless a different ratio is established and submitted to the department and accepted.

The sanitary facilities required for theaters and places of assembly are based upon the ratios found in Table 55.32. The number of people which must be considered are the total number of people present for the purpose of entertainment, recreation, worship or dining including those who may be outside of the assembly building. Taverns and restaurants with an outdoor dining area or beer garden must include the patrons in that outdoor area with the patrons inside the building when determining sanitary fixture requirements.

Places of outdoor assembly such as high school athletic fields must provide sanitary facilities based upon the total seating capacity provided. The sanitary fixtures required may be located in the school building if in close proximity and if the school building sanitary facilities are utilized to satisfy the requirement for athletic field facilities, access to the school facilities cannot be restricted.

Swimming pools are also regulated by Ch. Comm 90 of the Plumbing Code. It establishes maximum capacities for swimming/exercise pools, wading pools and whirlpools and requirements for associated dressing, shower and toilet facilities. The more restrictive of the two codes shall apply.

***Question:** How is the number of sanitary facilities required for outdoor tavern/restaurant areas determined?*

Answer: *Fencing off outside areas for beer gardens, restaurant seating, etc., allows the capacity of the tavern/restaurant to be expanded. Adequate sanitary facilities must be provided to serve the patrons outside of the building as well as those inside. Therefore, sanitary facilities shall be provided in accordance with COMM 55.32. Capacity for outdoor areas shall be determined utilizing 10 square feet per person or reasonable seating layouts. Simultaneous use of the indoor and outdoor areas shall be considered in calculating the required number of sanitary facilities. Permanent plumbing shall be provided for indoor and permanent outdoor uses. Portable sanitary fixtures may be utilized for special short term outdoor events if approved by the appropriate local authority (sanitation, zoning, and/or inspection official, etc.).*

Camp dining facilities (where food is cooked and served by staff) shall provide the minimum requirements of Table 55.32 (i.e., one water closet, one lavatory, one urinal for men or boys; two water closets and one lavatory for women or girls) in the dining hall. The additional required sanitary facilities must be located in reasonable proximity. (NOTE: OSHA and group camp codes cite 400 ft. as a maximum guideline). In the case of single sex camps (e.g., all boy scouts or all girl scouts), the ratio can be modified if the owner makes a reasonable request to the Division of Safety & Buildings in writing.

This application ***DOES NOT*** *apply to tent or RV campgrounds (where spaces are rented individually). Restaurant facilities near such occupancies would be treated as COMM 55 assembly halls and all required sanitary facilities required to be in the assembly hall.*

TABLE 55.32

NUMBER OF FIXTURES REQUIRED FOR PATRONS/OCCUPANTS IN PLACES OF ASSEMBLY

	Type of Fixture[1]				
	Water Closets (WC)			Drinking	
Number of Patrons/Occupants of Each Sex[2]	Males (M)	Females (F)	Urinals (U)	Facilities (DF)	Lavatories[3] (L)
1 - 100	1	1	0	One (DF) for each 150 occupants or fraction up to 600	One (L) for each 2 fixtures (WC) or (U) required, or both, or fraction
101 - 200	1	2	1		
201 - 250	1	3	2		
251 - 300	1	4	2		
301 - 350	2	5	2		
351 - 400	2	6	2		
401 - 450	2	7	3		
451 - 500	2	8	3		
501 - 600	2	9	4		
Over 600	One (WC) for each additional 600 (M) or fraction; one for each additional 275 (F) or fraction		One (U) for each additional 500 (M), or fraction	One additional (DF) for each additional 3,000 occupants	
Taverns and restaurants[1]	One (WC) for each 75 (M) or fraction; one (WC) for each 30 (F) or fraction		One (U)[2] for each 50 (M) or fraction	0	

This note is referenced by the [1] after taverns and restaurants in the above table.

[1] The ratio of the number of fixtures to the number of persons accommodated in excess of 300 need be one-half of the figures shown.

The following note [2] is referenced by the [2] under the urinal column and in the tavern and restaurant row.

[2] The urinal may be omitted in restaurants which accommodate less than 25 males and do not serve alcoholic beverages.

[3] A minimum of one lavatory shall be provided in each toilet room. Where a single toilet room designated as UNISEX is provided, it shall be considered as accommodating no more than 10 employes and 25 occupants.

This note is referenced by the [1] following type of fixture at the top of the table above.

Note 1: For structures with additions or alterations, the required number of sanitary fixtures shall be the sum of the fixtures required for the existing portion at the time it was constructed plus the fixtures required by this table for the new addition or altered area. At such time as the summation of the addition and alteration area is equal to or greater than 51% of the building area calculated as specified in s. COMM 50.03 (4)(d), fixtures shall be provided in conformance to this table utilizing the capacity of the entire building.

Note 2: See also rules of the department of health and social services for sanitary fixtures for public swimming places, mobile home parks, camping grounds, camping resorts, recreational camps and educational camps.

This note should also reference Comm 90 which now contains the sanitary fixture requirements for public swimming pools.

Note 3: For mixed-use facilities such as a dinner theater, use the required number for restaurants as specified in s. COMM 54.12 (2)(d) 2.

Note 4: See chapter COMM 69 for the percentage and design of accessible drinking facilities.

The table indicates that for taverns and restaurants, if the total capacity exceeds 300 patrons, the fixtures may be halved for those patrons in excess of 300. The ratio of fixtures to patrons is directly proportional, therefore, in lieu of having the fixtures in excess of 300, the patrons in excess of 300 can be halved. The following formula can be used to determine the capacity of a tavern or restaurant for purposes of entering Table 55.32:

[(C-300) 0.5 + 300] 0.5 = T

*In the above formula, C equals total capacity of the tavern or restaurant and T equals the number of persons, **per sex**, to be used when applying Table 55.32. For instance, if the total capacity of the tavern or restaurant is 1500 patrons (C = 1500), T will equal 450. This means that for purposes of Table 55.32 application, sanitary facilities must be provided for 450 males and 450 females.*

COMM 55.33 FIRE PROTECTION SYSTEMS.

(1) SPRINKLER SYSTEMS. Automatic fire sprinkler systems shall be provided as outlined in ss. COMM 52.01, 52.011, 52.012 and 52.013.

(2) STANDPIPE SYSTEMS.

(a) *Fire department standpipes.* Fire department standpipes shall be provided in all buildings exceeding 60 feet in height.

(b) *Dry standpipes.* Dry standpipes as specified under s. COMM 51.21 shall be provided in all buildings, except churches and places of worship, having theaters and assembly halls with an occupancy load of more than 750 persons, unless an approved automatic sprinkler system is installed. First-aid standpipes shall be provided on the stage of every theater and assembly hall where a proscenium curtain is required.

This section of the code is not intended to require any standpipes in any church or place of worship, regardless of occupant load.

(3) FIRE EXTINGUISHERS. Portable fire extinguishers shall be provided and maintained as specified in s. COMM 51.22.

COMM 55.39 USE OF "SAFETY-BASE" FILM.

(1) The requirements of ss. COMM 55.40 through 55.49 will not apply in buildings in which movie projectors are used with "safety-base" film provided the conditions of pars. (a) and (b) are met.

The requirements of COMM 55.39 through 55.49 with the exception of COMM 55.46 are applicable only if nitro-cellulouse film is used. If safety film is used, these code sections will not be applicable.

(a) The owner shall submit an affidavit to the department stating that "safety-base" film only will be used in all movie projectors.

(b) The affidavit shall be signed by the owner and the signature notarized.

Note: For definition of "owner," see s. 101.01 (2) (i), Stats.

COMM 55.40 MOTION PICTURE MACHINE BOOTHS, GENERAL.

Every motion picture machine using nitro-cellulose film, together with all auxiliary and associated equipment, shall be enclosed in a booth so arranged as to permit the operator to walk freely on either side and in back of the machine. At least 48 square feet in area shall be provided for one machine, and 24 square feet additional for each machine over one. The ceiling height shall be not less than 7 feet.

COMM 55.41 CONSTRUCTION OF BOOTH.

The floor of each motion picture booth shall be constructed of masonry or reinforced concrete, or shall be covered with not less than 2 inches of fire-resistive material. The walls and ceilings shall be not less than 2-hour fire-resistive construction as specified in s. COMM 51.04.

COMM 55.42 DOORS.

(1) The door to the booth shall be not larger than necessary for the safe and proper use and maintenance of the booth and equipment, but in no case shall its dimensions be smaller than 2 feet by 5 feet or larger than 3 feet by 7 feet. The top of the door shall be not less than 12 inches below the ceiling of the booth.

(2) The door shall be a tight-fitting self-closing fire door as specified in s. COMM 51.047, shall open outwardly, and shall not be equipped with any latch.

COMM 55.43 OPENINGS.

(1) Two openings for each motion picture machine may be provided. The one for the operator's view shall not be larger than 200 square inches and the one for projection not larger than 120 square inches. Where separate stereopticon, spot, or floodlight machines are installed, not more than one opening shall be provided for each such machine for both the operator's view and the projection of light. All such openings shall be as small as practicable.

(2) Each opening shall be provided with an approved gravity shutter set into guides not less than one inch at sides and bottom, and overlapping the top of the opening by at least one inch when closed. Shutters shall be not less than No. 10 U.S. Standard gauge iron or equivalent, arranged to move freely in guides of like material and thickness bolted to the wall. Each shutter shall be suspended by a cord and shall be so arranged that closing is by gravity action. A fusible link shall be provided in the cord over each shutter. A link shall also be provided over each magazine, which on operating will close all shutters. A manual release shall be provided near each exit door by which all shutters can be closed simultaneously. Shutters shall not be blocked open nor held open in any manner except by the harness of cords and links as herein described.

COMM 55.44 VENTILATION OF BOOTHS.

Every booth or room housing projection, sound or any other equipment which vitiates good air conditions or requires the attention of an attendant shall be ventilated as required by s. COMM 64.05. Fresh air intakes in booth walls, except for outside air, shall not exceed 72 square inches in area, nor be more than 3 inches above the floor. They shall be equipped with automatic shutters as described for projection openings.

COMM 55.45 RELIEF OUTLETS.

Every booth or room housing projection, sound or other equipment which constitutes a fire, smoke, explosion or fuming hazard shall be equipped with one or more gravity outlets extending upward from the ceiling through the roof. The net area of such gravity relief outlets shall be equal to one per cent of the room or booth floor area, but not less than 12 inches in diameter. Such outlets shall be constructed as sheet metal ducts having double walls with 1/2 inch air space between, or better construction. Where a relief outlet passes through, or is within 18 inches of any combustible

construction, or passes through any other occupancy, approved masonry flues as specified for chimneys, s. COMM 64.46, shall be used. The relief outlets shall be equipped, at the booth or room outlets, with a gravity shutter which will open automatically under excessive heat conditions. The automatic shutter shall normally be tightly closed where mechanical exhaust ventilation is required in the same room.

COMM 55.46 ELECTRIC WIRING.

All lights and electric wiring, also motors, arc lamps, rheostats, and associated electrical equipment shall conform in type and arrangement to the requirements of the Wisconsin state electrical code, vol. 2, ch. COMM 16.

COMM 55.47 MOTION PICTURE MACHINE.

Every projection machine shall be securely fastened to the floor, and together with sound head and other associated equipment, shall be of safe design. No part of the film shall be outside of a tight metal enclosure during projection, and the feed and take-up reels shall have riveted, flanged, or welded joints. A shutter shall be placed in front of the condenser, arranged so as to be closed except when held open by the operator, or by some mechanical device which will assure immediate closure when operation of the machine is stopped.

COMM 55.48 FIRE PROTECTION IN BOOTH; CARE AND USE OF FILM.

(1) All shelves, furniture and fixtures shall be incombustible. No combustible material shall be permitted to be within such booth, except films and film cement not exceeding one pint. Smoking is prohibited. Heating equipment in booths shall be limited to steam, warm air, hot water or electric convection heaters with low surface temperature elements. Radiators shall be protected by 1/4 inch mesh screen with the top sloped at least 45° to the horizontal.

(2) Films not in process of rewinding, examination or projection shall be kept in metal containers. Up to 40 pounds of film may be kept in the projection booth in interstate commerce commission shipping containers. Excess over 40 pounds shall be kept in an approved film cabinet, but the total quantity of film in any booth shall not exceed 125 pounds.

(3) Rewinding in the projection booth is prohibited unless done in an approved enclosed type rewind machine. An approved can with self-closing hinged cover shall be provided for scrap film.

(4) Up to 125 pounds of film in addition to that permitted in a projection booth, may be kept in containers as specified above, providing this excess is in a rewind room of not less than 80 square feet area, and of the construction specified in ss. COMM 55.41 and 55.42. Such room shall have a vent of at least 50 square inches in area extending upward to the outside of the building, with a clearance to combustible material conforming to s. COMM 55.45. Furniture and heating shall be as for the projection booth, and smoking is prohibited.

Note: The weight of a 1000 foot roll of 35 millimeter film is assumed as 5 pounds.

COMM 55.49 PORTABLE BOOTHS.

(1) Every portable booth used to confine the fire hazards of a motion picture machine shall be of approved design conforming to the requirements for permanent booths.

(2) Every booth used for more than 3 consecutive performances in one location will be considered a permanent booth.

COMM 55.50 MAINTENANCE.

55.50

All theaters and assembly halls, and all parts thereof, shall be kept clean, sanitary and in good repair.

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Chapter COMM 56

SCHOOLS AND OTHER PLACES OF INSTRUCTION

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Subchapter I — General Requirements

COMM 56.001 SCOPE.

The requirements of this chapter shall apply to all public and private schools, universities, colleges, academies, seminaries, libraries, museums and art galleries; including all buildings or parts of buildings used primarily for instructional purposes. This chapter does not apply to those types of art galleries where art work is intended for sale, dance studios or schools, nonacademic-music studios or schools, nonacademic-art studios or schools, self-defense schools, or other similar nonacademic training occupancies; such occupancies shall be regulated by the provisions of ch. COMM 54.

In addition to schools, colleges and universities, libraries, museums and art galleries are included under the scope of this chapter. To qualify as a museum or art gallery under the scope of this chapter, the operation must be primarily directed at display of artifacts and art work. If the primary purpose for the operation is sale of artifacts and art work, Chapter COMM 54 will apply.

Instructional occupancies offering nondegree programs such as dance studios, martial arts studios, employee training rooms and similar occupancies where customers receive limited training and instruction, are not included under the scope of the chapter and will be considered as COMM 54 occupancies. The intent of COMM 56 is to set forth requirements applicable to buildings where students receive full or part-time education leading to a degree or diploma.

The occupancy classification of a building or part of a building is based upon its use, not its ownership. An administrative office building owned by a college or university is considered under the scope of Chapter COMM 54 even though owned by a school and a student union building or student center owned by a college or university is considered under the scope Chapter COMM 55. Fine arts buildings and athletic field houses owned by colleges and universities will probably fall under the scope of Chapter COMM 56 even though public performance and athletic events are conducted in the building as the primary purpose in construction of the fine arts building or field house is to provide instruction in theater arts or athletics.

COMM 56.01 MAXIMUM HEIGHT.

(1) Buildings occupied primarily by pupils up to and including grade 12 shall not exceed 4 stories or 48 feet in height.

(a) *Exception.* Buildings provided with complete automatic sprinkler or automatic smoke detection systems, occupied primarily by students of grades 9 through 12, shall be no more than 6 stories or 72 feet in height.

Note: Also see requirements for classes of construction.

COMM 56.02 CLASSES OF CONSTRUCTION LIMITATIONS.

(1) Buildings within the scope of this chapter may not exceed the number of stories and height limits as specified in Table 56.02-1 based upon the type of construction utilized.

This section refers to COMM 55.02 with respect to construction requirements based upon capacity for large group occupancies. COMM 55.02 has provisions allowing unlimited capacity in a one-story building under certain circumstances. A building will take the classification of the most critical present unless 4-hour fire-division walls are provided. Therefore, a one-story gymnasium attached to a multistory school building will not qualify for the exceptions applicable to one-story buildings unless the gymnasium is separated from the multistory school by a 4-hour fire-division wall.

TABLE 56.02-1
MAXIMUM NUMBER OF STORIES

Class of Construction	Sprinklered[a]		Nonsprinklered	
	Height (in feet)	Number of Stories	Height (in feet)	Number of Stories
Type 1	No limit	No limit	60[b]	No limit
Type 2	95	9	60[b]	8
Type 3	85	3	60[b]	2
Type 4	85	3	60[b]	2
Type 5A	60	3	50	2
Type 5B	50	3	40	2
Type 6	60	3	50	2
Type 7	50	2	40	1
Type 8	45	2	35	1

[a] An automatic fire sprinkler system designed and installed in accordance with s. COMM 51.23 is provided throughout the entire building.

[b] Section COMM 52.01 requires the installation of sprinklers for buildings more than 60 feet in height.

(2) Those portions of buildings used as auditoriums, gymnasiums, field houses or assembly halls shall conform with the construction limitations specified in s. COMM 55.02.

It should be noted that the maximum capacities listed in Comm 55.02 pertain only to the capacity of individual rooms in Chapter 56, not the entire building. Also note that this reference to Ch. 55 is only for s. Comm 55.02 and does create the need for an occupancy separation. However, a four hour separation may be required if there is a change in class of construction, sprinklering or number of stories.

COMM 56.03 PROTECTION OF BASEMENT LEVELS.

(1) GENERAL REQUIREMENT. Buildings with basements shall at such levels be protected with an approved automatic sprinkler system as specified in s. COMM 51.23 or an approved automatic smoke detection system, as specified in s. COMM 51.245, either of which shall be electrically connected to the required fire alarm system.

Note: See s. COMM 51.245 for additional requirements pertaining to smoke detectors.

Note: See ss. COMM 52.012 (1) and 52.02 for additional requirements pertaining to basements.

(2) RETROACTIVITY. Existing buildings which do not conform to the requirements specified in sub. (1) on or after January 1, 1983, shall comply with the following:

(a) The corridors in the basement shall be protected by an approved smoke detection system.

(b) Smoke detection systems shall be installed in accordance with NFPA No. 72; but in no case shall smoke detectors be spaced more than 30 feet apart on center or more than 15 feet from any wall.

Note: See s. COMM 51.01 for definitions of "automatic" and "basement."

COMM 56.05 EXTERIOR WALL OPENINGS.

(1) ONE-STORY BUILDINGS. One-story buildings with no floor levels below the first floor need not be provided with exterior wall openings other than required exits.

(2) MULTISTORY BUILDINGS.

(a) Except as provided in par. (b), buildings more than one story shall be provided with fire department access openings as specified in s. COMM 52.02 (2).

(b) Fire department access openings are not required provided the building is protected throughout by an automatic fire sprinkler system and that system is connected to the required fire alarm system.

COMM 56.06 EXITS.

(1) TOTAL NUMBER OF EXITS. The total number of exits from each floor level and each building shall be determined on the basis of total aggregate exit width and distances to exit. Each building and each floor level shall be provided with at least 2 exits.

See COMM 54.02 (5) commentary.

Floor levels occupied only by staff may utilize the exiting provisions found in COMM 54. Floor levels which are occupied by students or patrons must meet the exiting requirements of this section. Industrial arts shop mezzanines used for material storage and project storage are considered as occupied by students and must meet the exiting requirements of COMM 56.

(2) TYPE OF EXITS. At least 2 exits from all floor levels shall lead directly to grade through standard exit doors, stairs, interior enclosed stairs, smokeproof stair towers, fire-rated exit corridors, passageways, or ramps. One-half of the remaining required exits may be horizontal exits or fire escapes. Fire escapes are prohibited as required exits in pre-school, elementary, middle, and high schools. In no case will fire escapes be permitted above the second story.

(a) *Standard exit doors.* Standard exit doors shall be provided in accordance with the requirements of ss. COMM 51.15 and 56.08.

(b) *Stairs.* Stairs shall conform to the requirements of ss. COMM 51.16 to 51.166, except that handrails shall be provided on both sides and no closets or rooms may be placed under a stairway or landing.

(c) *Interior enclosed stairs and smokeproof stair towers.* Interior enclosed stairs and smokeproof stair towers shall conform with ss. COMM 51.18 and 51.17, respectively.

All exit stairways must be enclosed in accordance with COMM 51.18. Unenclosed exit stairways regardless of the number of stories in the building are not permitted except for stairways serving open mezzanines and open balconies. See COMM 51.02 (11) commentary for open mezzanine criteria.

Care should be exercised when analyzing the exiting from "balconies" and "mezzanines" in school auditoriums and gymnasiums. If the school building is multistory and the theater or gymnasium upper level is at the same elevation as an upper story in the school building, that upper level in the gymnasium or auditorium is considered as part of the school story, not a mezzanine or balcony, and may not be exited via unenclosed stairways. If the auditorium or gymnasium is separated from the school by a 4-hour fire-division wall, the upper level could then be considered a balcony or mezzanine.

(d) *Fire-rated exit corridors.* All rated exit corridors required to satisfy limitations on exit distance shall be of not less than one-hour fire-resistive construction, unless the fire-resistive ratings indicated in Table 51.03-A for required exit corridor enclosures are more restrictive.

(e) *Exit ramps.* The minimum width of exit ramps shall be determined in accordance with the requirements of s. COMM 56.07. The minimum width shall be not less than 3 feet 8 inches.

Exit ramps, other than those required for the physically disabled, shall have a slope not exceeding 1:8. Ramp slopes exceeding 1:12 shall be provided with handrails. Ramps shall be provided with a slip-resistant finish. Ramps shall be provided from areas noted under sub. (3)(c) involving a change of elevation between floor levels or platforms not exceeding 3 feet.

(f) *Fire escapes.* Fire escapes shall be constructed in accordance with the requirements of s. COMM 51.20.

The introductory requirements of this section prohibit fire escapes as required exits in preschools, elementary, middle, and high schools and above the second story.

(g) *Horizontal exits.* Horizontal exits shall be constructed in accordance with the requirements of s. COMM 51.19 and shall be of at least 4-hour rated construction.

(3) LOCATION OF EXITS.

(a) *Exit distance.*

1. Travel distance to an exterior exit door, a required fire-resistive rated exit corridor, interior enclosed stairs, smokeproof stair tower, horizontal exit, or fire escape, from any point in a building accessible to the public, shall not exceed 150 feet.

2. Where an approved automatic fire sprinkler system is provided throughout the building, an increase in exit distance to 200 feet will be permitted.

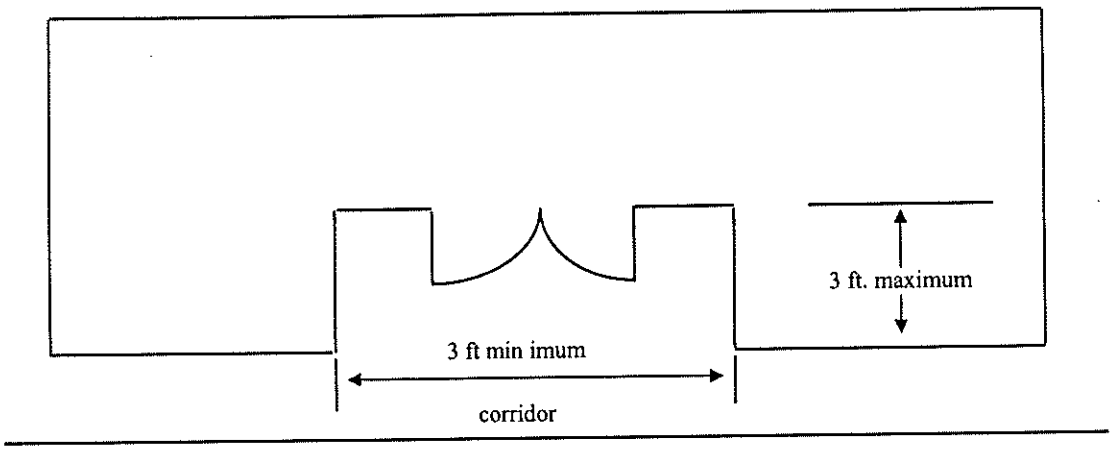
3. Building service areas, including pipe chases and tunnels, catwalks, ducts or similar spaces not accessible to the public, shall not exceed 300 feet from an exit.

(b) *Distribution of exits.* All exits shall be distributed to provide the best possible means of egress. The exits shall be located so that in case any exit is blocked at any point some other exit is accessible through public passageways at all times. Locked security gates and doors shall not be placed so as to block required exit passageways or create dead-end corridors.

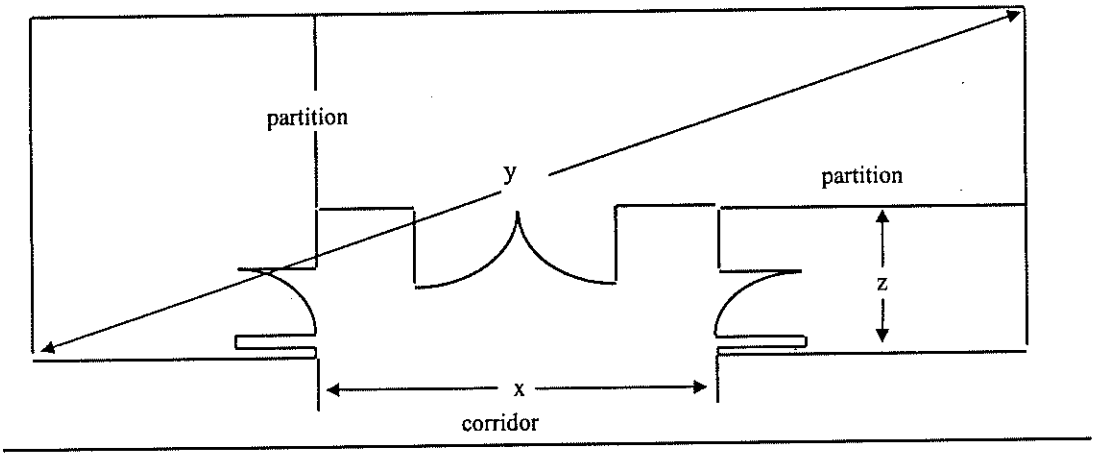
Locked security gates are prohibited where such gates create dead-end corridors, even during times when the school is unoccupied. If one approaches a security gate location and if that gate is not openable from the side being approached and it is necessary for the person approaching to reverse direction to find another exit, that gate is not permitted.

Question: *What angle must be maintained between two directions of egress in a corridor?*

Answer: *The angle between two directions of egress for doors opening into corridors shall be not less than 90°. An exit door may be recessed a maximum of 3 feet into an alcove serving only that exit providing the alcove width is at least 3 feet.*



An angle between directions of egress within a space shall be satisfactory, providing passageways are maintained to corridor access points separated a minimum distance of at least 1/2 of the diagonal of the area served or 20 feet, whichever is greater. See diagrams below.



$X \geq y/2 \geq 20$ ft

and

$X \geq Z$

(c) *Auditorium, gymnasium and field house exits.* This rule shall apply only to auditoriums, gymnasiums and field houses which have a capacity exceeding 600 persons. One-half of the required exits shall discharge directly to a street, alley or open court connected with a street, unless a 2-hour rated exit corridor is provided, wide enough to accommodate one-half of the occupants, which extends from the interior wall of the auditorium, gymnasium or field house to an exterior exit. The remaining required exits shall discharge directly to the exterior or to a public passageway which permits 2 directions of travel to the exits at the exterior of the building. The exiting shall be direct and unobstructed.

Lobbies, foyers and vestibules provided for large group occupancy rooms are considered a part of that large occupancy room. Therefore, exits leading from the large room into a lobby or foyer and then to the outside are considered as exits discharging directly to the exterior.

See COMM 55.12 commentary.

(4) CLASSROOM EXITS.

(a) *Scope.* This subsection shall apply only to rooms for formal instruction of students with direct teacher supervision. This subsection does not apply to other parts of schools or places of instruction, including but not limited to, cafeterias, instructional media centers, gymnasiums, industrial arts shops, laboratories, or locker rooms.

(b) *Exits serving 50 persons or less.* At least one exit shall be provided from all rooms serving a capacity of 50 persons or less. The exit shall discharge directly to the exterior of the building or to a public passageway which permits 2 directions of travel to the exterior.

A public passageway must be a 4-foot wide, unobstructed path, but does not necessarily have to be a walled corridor.

Question: In determining the number of exits provided from a room in an educational building, when does COMM 56.06 (4)(a) apply and when does COMM 51.151 apply?

Analysis: Webster's Unabridged Dictionary defines a classroom as a place for conducting ***formal instruction*** *of students by a teacher in a school or college.*

COMM 56.06 (4) is an exception to COMM 51.151 for exits from classrooms. The exception to COMM 51.151 is granted for classrooms because the formal instruction atmosphere with continual and direct teacher supervision would allow for a more orderly exiting.

Answer: Rooms such as cafeterias, IMCs, libraries, gymnasiums, industrial arts shops, laboratories, locker rooms, or open study rooms are not considered as classrooms for exiting criteria, thus may not use the exiting requirements of COMM 56.06 (4). These rooms shall comply with the requirements of COMM 51.151 for number of exits and exit distribution.

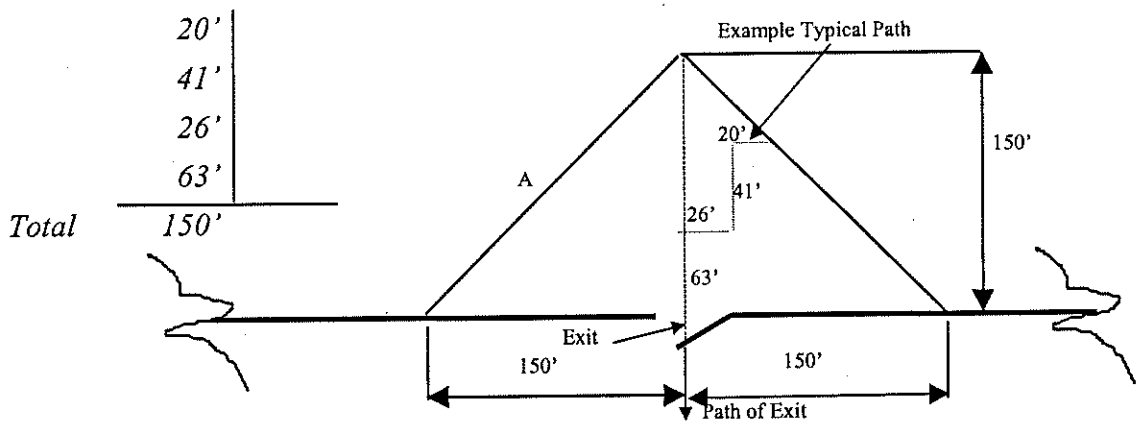
(c) *Exits serving 51-100 persons.* At least 2 exits shall be provided from all rooms serving a capacity of 51-100 persons. One exit shall discharge directly to the exterior of the building or to a public passageway which permits 2 directions of travel to the exterior. One exit may discharge through an adjacent room provided a clear passageway is maintained from the connecting door to a required exit serving the adjacent room.

(d) *Exits serving more than 100 persons.* At least 2 exits shall be provided from all rooms serving a capacity of more than 100 persons. The exits shall discharge directly to grade or to a public passageway which permits 2 directions of travel to the exterior.

(5) WIDTH OF EXITS. The total required exit width shall be provided in accordance with the requirements of s. COMM 56.07.

(6) EXIT LIGHTS. All required exits indicated in s. COMM 56.06 (2), and exits from areas serving a capacity of more than 100 persons, shall be identified by an approved exit light. Directional exit lights shall be provided to direct occupants to an exit. Exit lights and directional exit lights shall be as specified in s. COMM 51.15 (5).

Exit Distance. *The following illustrations and text are provided to explain the procedure and intent of using the triangulation method of exit distance determination.*



Procedure:

1. Beginning at designated exit type, measure required exit distance (150 feet, for example) at right angles to and parallel with (on both sides) the exit.

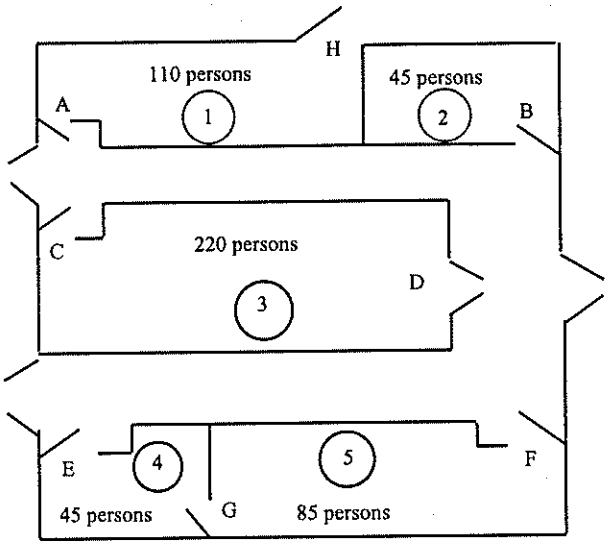
2. Connect end points to form the "exit triangle."

3. All areas within the triangle are within the required exit distance when traveling toward or at right angles to the exit.

4. All the interior space of a building must fall within the "exit triangles" formed by using the required exits for the building.

5. Location of an exit or exit access from the room must also be within the triangle. Room A above is beyond exit distance due to door location.

6. When measuring exit distance in stairways, only the horizontal travel distance is included in the determination.



COMM 56.06 (4) Number of Classroom Exits

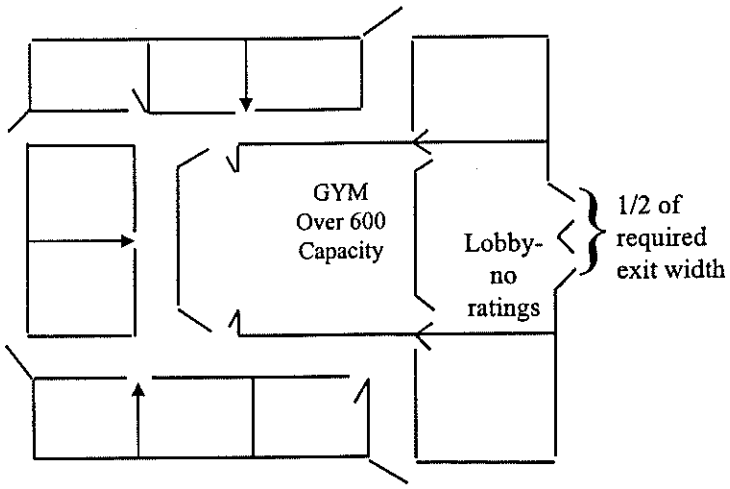
Rooms (2) and (4) may have single exit as capacity ≤ 50

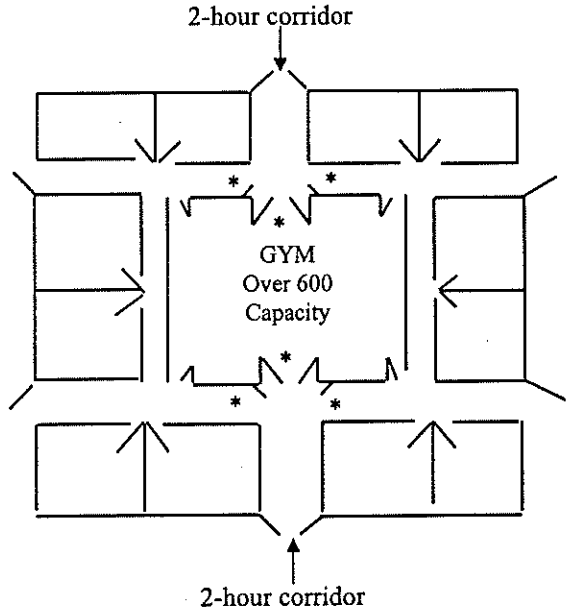
Room (5) has exit to corridor and exit through room (4) as capacity is > 50 but < 100

Rooms (1) and (3) have two exits direct to corridors or to outside as capacity > 100

Doors A, H, C, D, E, F, and G swing out as room capacity > 50

Door B swings in as room (2) capacity ≤ 50





* ≥ 1 1/2 hour "B" fire doors 1/2 of required exit width via 2-hour exit corridors

COMM 56.07 REQUIRED EXIT WIDTH.

(1) The total required exit width from a building level shall be in accordance with the requirements of ss. COMM 51.15 (6) and 51.16 (3).

(2) The capacity of educational buildings or any individual story or section thereof for the purpose of determining exits shall be the maximum capacity designated on approved plans.

(a) The maximum capacity shall not exceed the requirements of par. (b).

(b) The maximum capacities of all rooms and spaces as listed below shall be determined on the basis of the minimum net square feet area per person shown for that occupancy unless otherwise designated on the plans.

		Minimum Square Feet Per Occupant
1.	Academic classrooms -- Regular	20
2.	Administrative and office space	75
3.	Arts, crafts, drafting	30
4.	Bleachers (one seat per 18 inches of bench length)	
5.	Gymnasiums, field houses, auditoriums, theatres, lecture rooms (fixed seating)	6
6.	Gymnasiums, field houses, multipurpose rooms, cafeterias, study halls, commons and other level floor areas with nonfixed individual seating	10
7.	Home economics, business education	30
8.	Industrial arts-vocational shop	50
9.	Laboratories-Science (fixed lab. Tables)	30
10.	Libraries and resource centers	20
11.	Museums and art galleries	40
12.	Music	
	a. Vocal	10
	b. Instrumental	20
13.	Special education	
	a. Mentally retarded, physically handicapped, etc.	35

Question: *COMM 56.07 (2) specifies that capacity of school rooms shall be based on square footage unless the capacity is designated on the plans. If square footage per person is not used, what criteria should be used to determine the capacity designated on the plans?*

Answer: *As a starting point, the capacity of a room should be calculated based on square feet/person. Then the anticipated maximum capacity for the largest special event should be considered to determine room exiting. Then other criteria such as enrollment figures, likelihood of simultaneous use of similar rooms, etc., could be incorporated to justify a reduction in capacity. The attached form has been developed to document criteria used to justify capacity designated on the plans which is less than that determined by square footage per person. This form must be signed by the owner or school administrator. The indicated capacity shall be the minimum used for both building and HVAC designs.*

OCCUPANCY VERIFICATION
COMM 56
SCHOOLS, LIBRARIES, MUSEUMS, ART GALLERIES

INSTRUCTIONS: The construction classification, exiting and sanitary facility requirements are based on the number of building occupants. The capacity of buildings, and rooms within the building, are based on the net square feet of floor area as indicated by COMM 56.07 unless otherwise designated ON THE PLANS.

If a capacity other than indicated by area is designated, and deemed reasonable by the department, the construction classification, exiting and sanitary facilities will be based on the designated capacity. Therefore, no greater number than that designated may occupy the building or part of the building.

Please complete this form and submit it with the building plans if you wish to base capacity on designation rather than area.

This building is an:

☐ Elementary School ☐ Middle or Jr. HS ☐ High School, College

☐ Library ☐ Museum ☐ Art Gallery ☐ Other (Specify_____)

If this is a school, it is designed for a maximum enrollment of_____.

The following large group occupancy rooms will have the capacities indicated. Include gymnasiums, natatoriums, auditoriums, field houses, multi-purpose rooms, study halls, cafeterias, and similar rooms and areas. Do not include on this form typical classrooms, shops, laboratories, locker rooms, toilets, and offices, however, the capacities of these rooms must be shown on the plans.

		MAXIMUM CAPACITY			
		SCHOOL EVENT		NON SCHOOL EVENT	
ROOM NO.	ROOM NAME	DURING SCHOOL	AFTER ACHOOL	DURING SCHOOL	AFTER SCHOOL

I, the undersigned, state that the maximum capacity of the rooms indicated will never exceed that indicated above, the building has been designed based on these capacities, and that the above capacities have also been indicated ON THE PLANS submitted for review and approval.

_____
Signature of Owner

_____
Typed Name

_____
Title

SBD-9872 (N.12/93)

COMM 56.08 EXIT DOORS.

(1) **STANDARD EXIT DOORS.** Exit doors shall comply with the requirements of s. COMM 51.15. The aggregate width of exit doors shall be as required in s. COMM 56.07. No single door or leaf of a double door shall be more than 42 inches wide.

Section 51.15 requires that all exit and exit access doors be provided with hardware that will allow the door to be opened from the inside upon turning a single knob or handle, or pushing on a single bar or plate. The use of a key to open the door from the inside is prohibited, even for "Time Out Rooms".

(2) **CLASSROOM EXIT DOOR WIDTH AND SWING.**

(a) *Classroom doors serving 50 persons or less.* Classroom doors serving classrooms with a capacity of 50 persons or less shall be not less than 3 feet 0 inches in width. The doors may swing into the classroom.

This section applies only to classrooms. Please see the commentary discussion under COMM 56.06 (4).

(b) *Classroom doors serving more than 50 persons.* Classroom doors serving classrooms with a capacity of more than 50 persons shall be standard exit doors and shall swing outward toward the means of egress.

(3) **ALL OTHER EXIT DOORS.** Doors serving areas other than classrooms shall comply with s. COMM 54.06.

COMM 56.09 PASSAGEWAYS.

(1) The minimum unobstructed width of corridors and passageways which are used by the public or by the occupants generally, shall be determined in the same manner as specified for stairways in s. COMM 56.07, but in no case shall this width be less than 4 feet. Corridors and passageways serving as a means of egress shall be at least equal in combined width to the required width of the stairways or passageways leading to them.

COMM 56.10 ENCLOSURE OF STAIRWAYS AND SHAFTS.

All stairways and shafts shall be enclosed in accordance with s. COMM 51.02 (11).

COMM 56.13 ASSEMBLY SEATING.

All assembly seating in auditoriums, gymnasiums, field houses and other large group occupancy areas shall comply with the requirements of subch. V, Assembly Seating Facilities, of ch. COMM 62. Where any area of a building in this category has a stage loft in excess of 25 feet 0 inches in height above the stage floor and is equipped with permanent or movable scenery, it shall comply with ss. COMM 55.21 through 55.30.

The provisions of COMM 62 apply only to the seating area, not to the room or building in which the seating is provided. Please see the discussion under COMM 55.13.

If the vertical clear dimension between the stage floor and the bottom of the roof framing exceeds 25 feet 0 inches, the provisions of COMM 55.21 through 55.30 must be met. If the clear dimension is 25 feet 0 inches or less, the area will be considered a platform rather than a stage.

COMM 56.14 SEATS, DESKS AND AISLES.

(1) Seats, desks, tables and other loose equipment need not be fastened to the floor or to each other provided that any seating arrangement use, will maintain during occupancy, free and unobstructed intermediate, cross and wall aisles leading to the exit.

(a) Stepped floors or tiered platforms shall be no less than 48 inches in width to permit the above arrangement.

If elevated platforms are constructed to provide stepped or tiered floor levels in lecture rooms and other such facilities, the construction of the raised platforms must be in compliance with COMM 51.02 (3)(c).

(b) Seats, desks, tables and other loose equipment used in instructional occupancies shall be of a durable type of construction to assure safety and stability.

COMM 56.145 OCCUPANCY SEPARATIONS AND HAZARD ENCLOSURES.

Occupancies within the scope of this chapter shall be separated from other occupancies or uses in accordance with s. COMM 51.08. Hazards shall be enclosed in accordance with s. COMM 51.08.

COMM 56.16 SANITARY FACILITIES.

(1) TOILET ROOMS. Separate toilet rooms for each sex shall be provided for all occupancies included under the scope of this chapter. The toilet rooms shall be completely enclosed and arranged to ensure privacy.

(2) SEX DESIGNATION. Where separate toilet rooms are required by the code, each toilet room shall be clearly marked for which it is designated as specified in s. COMM 52.52.

(3) SANITARY FIXTURES.

(a) The number of sanitary fixtures shall be determined by the number of persons of each group or combination of groups using Table 56.16. The number of persons in each group shall be designated on the plans.

(b) When fixtures required for a designated group are not available to another designated group, the number of fixtures shall be provided according to the ratio indicated in Table 56.16 and independent of the number or ratio of fixtures provided for another group.

(c) Where a theater is a part of an educational facility, the requirements for the number of fixtures to be provided shall be determined as specified in Table 56.16 for large group areas.

The sanitary facilities required for libraries, museums and art galleries shall be based upon the requirements indicted for post high school.

Note: Section COMM 52.60 (2) (b) allows only stall type urinals in elementary schools from kindergarten through 8th grade.

In accordance with COMM 52.60 (2)(b), wall-hung urinals are prohibited in elementary schools (K through 8). Stall type urinals must be used in elementary schools.

Swimming pools are also regulated by Ch. Comm 90 of the Plumbing Code. It establishes maximum capacities for swimming/exercise pools, wading pools and whirlpools and requirements for associated dressing, shower and toilet facilities.

TABLE 56.16
NUMBER OF PERSONS BY GROUP FOR EACH TYPE OF SANITARY FIXTURE FOR OCCUPANTS[1]

	Number of Persons per Fixture by Designated Group[2]				
Type of Fixture	Grades K-6	Grades 7-12	Post High School	Large Group Areas	Administrative Areas
Water Closets (WC)(F)	35	50	100	200	10
Water Closets (WC)(m)	75	100	200	300	15
Urinals (U)(M)[3]	35	50	100	150	40
Lavatories (L)[4]	75	100	100	150	15
Drinking Fountains (DF)	40	50	50	150	100

[1] For the purpose of this table, please refer to the appropriate occupancy chapter. Where a single toilet room designated as UNISEX is provided, it shall be considered as accommodating no more than 10 employes and 25 occupants.

[2] Example: For grades K-6, one (WC) for each 35 (F), one (WC) for each 75 (M) and one (U) for each 35 (M) need to be provided.

[3] Section COMM 52.60 (2)(b) allows only stall-type urinals in schools for grades K-8.

[4] A minimum of one (L) and one (WC) shall be provided in each toilet room.

Note: For structures with additions or alterations, the required number of sanitary fixtures shall be the sum of the fixtures required for the existing portion at the time it was constructed plus the fixtures required by this table for the new addition or altered area. At such time as the summation of the addition and alteration area is equal to or greater than 51% of the building area calculated as specified in s. COMM 50.03 (4)(d), fixtures shall be provided in conformance to this table utilizing the capacity of the entire building.

Note: See chapter COMM 69 for the percentage and design of accessible drinking facilities.

COMM 56.17 LIGHTING.

(1) ELECTRIC LIGHTING. Every class, study or recitation room shall be equipped with sufficient electrical lighting units to maintain the illumination required in ch. Ind 19, Illumination Code.

(2) GENERAL. All other rooms and spaces in school buildings shall be equipped with means for supplying electric illumination in the quantity required for the purpose for which the room or space is used. All electrical work shall be installed to conform to the requirements of the Wisconsin State Electrical Code, vol. 2, ch. COMM 16.

COMM 56.19 FIRE ALARMS.

Every building shall be provided with a proper alarm system complying with s. COMM 51.24.

The requirement for fire alarms is applicable to all buildings under the scope of Chapter COMM 56 including libraries, museums and art galleries.

COMM 56.20 FIRE PROTECTION SYSTEMS.

(1) SPRINKLER SYSTEMS. Automatic fire sprinkler systems shall be provided as outlined in ss. COMM 52.01, 52.011, 52.012 and 52.013.

(2) STANDPIPE SYSTEMS.

(a) *Fire department standpipes.* Fire department standpipes shall be provided in all buildings exceeding 60 feet in height.

(b) *Dry standpipes.* Dry standpipes shall be provided in all buildings 3 stories or more in height, unless an approved automatic sprinkler system is installed.

(3) FIRE EXTINGUISHERS. Portable fire extinguishers shall be provided and maintained as specified in s. COMM 51.22.

COMM 56.21 PUBLIC SCHOOL INSPECTIONS.

(1) Maintenance inspections of public schools, as required by s. 101.12 (6)(a), Stats., shall be conducted by authorized employes of the department except that 1st class cities may perform these inspections, to determine whether each school complies with the following:

(a) The applicable requirements of chs. COMM 50 to 64, including the life-safety requirements in subch. IV of this chapter;

(b) The applicable requirements in ch. 145, Stats., relating to plumbing and fire protection systems; and

(c) The requirements in s. 120.12 (5) and 121.02 (1)(i), Stats., to have an annual building maintenance schedule and to be safe and healthful.

(2) "Applicable", as used in sub. (1)(a) and (b), means the requirements in effect at the time of construction of the building or building addition, and also means the retroactive requirements, such as the life-safety requirements for schools constructed prior to January 1, 1950, in subch. IV of this chapter.

Subchapter II — Relocatable Classrooms

COMM 56.30 SCOPE.

This part provides the minimum requirements for the design and construction of relocatable classrooms as defined in s. COMM 56.31.

COMM 56.31 DEFINITIONS.

"Relocatable classrooms" mean mobile home type structures located on permanent foundations and equipped and used for educational instruction.

COMM 56.32 GENERAL.

Relocatable classrooms shall comply with the applicable sections of this code except as otherwise specified in this part.

COMM 56.33 ANCHORING REQUIREMENTS.

Provisions acceptable to the department for the prevention of overturning of the relocatable classroom as a result of wind pressure shall be made.

Note: The department accepts provisions such as ground anchors installed in accordance with ANSI standard A 119.1.

COMM 56.34 EXIT DOORS AND EXIT LIGHTS.

(1) EXIT DOORS. Exit doors shall be at least 3 feet 0 inches in width.

(2) EXIT LIGHTS. Illuminated exit lights are not required in relocatable classrooms.

COMM 56.35 CLASS OF CONSTRUCTION SEPARATIONS.

Relocatable classrooms connected to another building shall be separated by class of construction separations as specified in s. COMM 51.02 (20).

Relocatable classrooms are typically Type 8 construction. COMM 51.03 (8) requires that buildings of Type 8 construction be located at least 10 feet from any other building or property line.

Therefore, a Type 8 relocatable classroom whether connected to the main school building by a corridor or not ***must be located at least 10 feet from the main school building*** *or a 4-hour separation wall provided.*

COMM 56.36 BARRIER-FREE REQUIREMENTS.

An accessible entrance, interior circulation and toilet facilities for people with disabilities need not be provided for a relocatable classroom if the courses taught in the relocatable classroom are available in accessible facilities at the same school site

COMM 56.37 SANITARY FACILITIES.

(1) SANITARY FIXTURES. The number of sanitary fixtures for relocatable classrooms shall be provided in accordance with the requirements of ss. COMM 52.50 through 52.64 and 56.16.

(a) *Exception.* Sanitary fixtures need not be provided in each relocatable classroom structure if the sanitary fixtures in the main school building are convenient and available for use during all hours of operation and the relocatable classroom structure is connected to the main school building with an enclosed passageway.

COMM 56.38 FIRE ALARMS.

Relocatable classroom structures containing more than 2 classrooms or connected to another building shall be provided with a fire alarm system as specified in s. COMM 51.24.

If a relocatable classroom is connected to the main building, thereby requiring a fire alarm system, that fire alarm system in the relocatable classroom must be interconnected with the main building alarm.

Subchapter III — Mobile Training Units

COMM 56.40 SCOPE.

This part provides the minimum requirements for mobile training units as defined in s. COMM 56.41.

COMM 56.41 DEFINITIONS.

"**Mobile training units**" mean trailer type units constructed and left on wheels. Mobile training units are used for education purposes at one site for a period of time no greater than 9 weeks per year.

COMM 56.42 GENERAL.

Mobile training units shall comply with the applicable sections of this code except as otherwise specified in this part.

COMM 56.43 EXIT DOORS AND EXIT LIGHTS.

(1) EXIT DOORS. Exit doors shall be at least 3 feet 0 inches wide.

(2) EXIT LIGHTS. Illuminated exit lights are not required for mobile training units.

COMM 56.44 BARRIER-FREE REQUIREMENTS.

An accessible entrance, interior circulation and toilet facilities for people with disabilities need not be provided for mobile training units if the courses taught in the mobile training units are available in accessible facilities at the same school site.

COMM 56.45 SANITARY FACILITIES.

(1) TOILET ROOMS.

(a) Toilet rooms within the mobile training unit shall comply with the requirements of ss. COMM 52.50 through 52.64 and 56.16.

(b) Toilet rooms in the mobile training unit in which the toilet room door is equipped with a privacy lock, the requirements specified in s. COMM 52.29 are not applicable.

(2) SANITARY FIXTURES. Sanitary fixtures are not required in the mobile training unit provided the sanitary fixtures in the main school building are available for use during all hours of operation.

(3) ACCESSIBILITY. Toilet facilities accessible for the physically disabled need not be provided if accessible toilet facilities in the main school building are provided and available for use during all hours of operation.

COMM 56.46 FIRE ALARMS.

Mobile training units used individually are exempt from the provisions of s. COMM 56.19.

Subchapter IV — Life-Safety Requirements for Existing Schools

COMM 56.50 SCOPE.

The provisions of this subchapter shall apply to all existing buildings and portions of buildings constructed prior to January 1, 1950, which are publicly owned or leased as schools and primarily used for instructional purposes for students up to and including grade 12.

The balance of the code requirements in Chapter COMM 56 apply to all existing buildings and portions of buildings constructed prior to January 1, 1950, as indicated under the scope. The department has conducted an extensive inspection program of these schools, issued orders and suggestions where appropriate, and ensured that the orders and directives have been met. ***This program known as the Aging School Program is nearing completion thereby regulating Subchapter IV to a maintenance section only.*** *Chapters COMM 56.50 through 56.66 do not apply to new buildings or additions. Therefore, no commentary has been developed for Chapters COMM 56.50 through 56.66.*

COMM 56.51 PURPOSE.

The purpose of this subchapter is to incorporate modern safety requirements in all existing schools constructed prior to January 1, 1950, to improve the life-safety of the occupants in these buildings.

COMM 56.52 DEFINITIONS.

In this subchapter:

(1) "Funding is in place" means approval to fund through board approval, annual meeting approval, referendum or similar term.

(2) "Life-safety plan" means the individual plan developed for a school to improve the life-safety of the school.

(3) "Life-safety standards" means the individual plan developed for a school to improve the life-safety of the school.

(4) "Light-panel frames" means any glazed openings.

(5) "Special department inspection program" means inspections performed by the department to evaluate existing schools in accordance with life-safety standards and to establish an individual life-safety plan for each school.

(6) "**Transfer grille**" means an opening in a wall or door which permits air to flow from one space to another.

(7) "**Written determination**" means a decision by the department after reviewing plans and specifications or other information.

COMM 56.53 SCHOOLS CONSTRUCTED PRIOR TO 1930.

Schools constructed prior to 1930 shall comply with the following requirements:

(1) PRE-1930 SCHOOLS INSPECTED PRIOR TO JANUARY 1, 1989.

(a) *Codes and standards.* The recommendations specified in the individual life-safety plan for the pre-1930 schools inspected prior to January 1, 1989, shall comply with the standards specified in ss. COMM 56.63 to 56.66.

(b) *Compliance dates.*

1. Pre-1930 schools inspected prior to January 1, 1989, shall implement on or before August 1, 1990, the recommendations of the written life-safety plan developed by the department through the special department inspection program.

2. The August 1, 1990, compliance date may be extended to those schools where an extension of time for compliance as specified in s. COMM 56.56 has been granted in writing by the department.

Note: The department issued an emergency rule on pre-1930 schools on July 31, 1989, requiring code violations to be corrected by September 1, 1989, and a written implementation plan on the life-safety plan to be submitted to the department by December 1, 1989. Pre-1930 schools inspected prior to January 1, 1989, were evaluated using the inspection form SBD-8013.

(2) PRE-1930 SCHOOLS INSPECTED AFTER JANUARY 1, 1989.

(a) *Codes and standards.* Any pre-1930 school inspected after January 1, 1989, shall be evaluated in accordance with ss. COMM 56.63 to 56.66.

(b) *Compliance dates.* Individual compliance dates to implement the life-safety plan shall be established by the department for each school.

COMM 56.54 SCHOOLS CONSTRUCTED BETWEEN JANUARY 1, 1930, AND JANUARY 1, 1950.

Schools constructed between January 1, 1930, and January 1, 1950, shall comply with the following requirements:

(1) CODES AND STANDARDS. The life-safety standards specified in ss. COMM 56.63 to 56.66 shall be used to evaluate schools constructed between January 1, 1930, and January 1, 1950.

(2) COMPLIANCE DATES. All violations identified through the special department inspection program shall be corrected by September 1, 1991, unless an extension of time for compliance as specified in s. COMM 56.56 has been granted by the department.

COMM 56.56 EXTENSION OF TIME FOR COMPLIANCE.

A school district may request in writing an extension of time to comply with any code violation or the life-safety plan. Extensions may be granted in accordance with one or more of the following:

(1) CONSTRUCTION PROBLEMS. The department may grant a reasonable extension of time in order to permit a school district to:

(a) Prepare plans for construction and issue bids for construction;

(b) Complete construction that has been delayed due to availability of materials, weather conditions, or other construction-related problems;

(c) Implement interim approved safety measures to protect the building occupants during the time of extension; or

(d) Obtain written approval of an alternate life-safety plan.

(2) FUNDING PROBLEMS.

(a) A school district may request a one year extension if the school district is unable to implement the life-safety plan due to inadequate funding.

(b) Requests for extensions indicating the school district is unable to correct the code violations or implement the life-safety plan due to inadequate funds shall be submitted to the department with:

1. A written statement obtained from the department of public instruction stating that the school district is unable to borrow money or to use the school's operating reserve to implement the required life-safety standards;

2. A copy of a written plan submitted to the department of public instruction on how the school district will obtain the funds to complete the life-safety plan; and

3. An alternate life-safety plan identifying the interim measures that will be provided to protect the building occupants. The alternate life-safety plan shall be prepared by a registered engineer or architect.

(3) EXTENSION TO BUILD NEW SCHOOL OR MAJOR REMODELING. A school district may request an extension of time to comply with the life-safety plan if a school district has approval to construct a new school or additions, or to do major remodeling in the existing building.

(a) The following criteria shall be submitted to the department for a written determination on the request for extension:

1. Written notification and commitment that the funding is in place and that a new school or addition will be constructed or the existing school will undergo major remodeling; and

2. An alternate life-safety plan identifying the interim measures that will be provided to protect the building occupants. The alternate life-safety plan shall be prepared by a registered engineer or architect.

(b) Plans and specifications for any new construction, addition or major remodeling shall be submitted in accordance with s. COMM 50.12.

(c) The department may grant a 2 year extension to complete the new construction or remodeling. The department may grant an extension longer than 2 years where the school district provides documentation from the architect or engineer and the contractor that the construction will take longer than 2 years.

COMM 56.57 FAILURE TO COMPLY.

If the department determines that the rules or any extensions to comply with the rules have not been complied with, the department will notify the state superintendent of public instruction to review the matter under s. 115.33, Stats.

COMM 56.58 LIFE-SAFETY EVALUATION PROCEDURES.

A life-safety evaluation shall be conducted for each existing school in accordance with the following:

(1) QUALIFICATIONS OF EVALUATOR. The initial and follow-up inspection for the life-safety evaluation shall be performed by the department or a registered architect or engineer. School districts utilizing registered architects or engineers to perform the life-safety evaluation shall notify the department in writing.

(2) STANDARDS FOR EVALUATION. All life-safety evaluations shall be performed using the standards specified in ss. COMM 56.63 to 56.66.

(3) LIFE-SAFETY EVALUATION FORM. The life-safety evaluation shall be conducted using the life-safety evaluation form which is based on ss. COMM 56.63 to 56.66.

The rules establish the inspection protocol procedures to evaluate the condition of the schools and life-safety standards the schools are required to meet. The life-safety standards contain requirements for:

1. Improving exiting conditions;

2. Providing physical barriers to prevent the spread of smoke into the exit passageways;

3. Providing early detection and warning devices;

4. Equipping mechanical ventilation systems with automatic smoke detection and shut-off devices;

5. Upgrading the building fire alarm; and

6. Evaluating existing electrical wiring systems.

The rules outline the procedures schools are required to follow in implementing the life-safety plans established by the department or in developing alternative life-safety plans.

Note: Life-safety evaluation form (SBD-8259) is available from the Safety and Buildings Division, P.O. Box 7969, Madison, Wisconsin 53707.

(a) *Procedures.* Each school building shall be evaluated to determine compliance with the requirements specified in ss. COMM 56.63 to 56.66, using the life-safety evaluation form as follows:

1. Complies. If the building complies, the evaluator shall check the "complies" column.

2. Does not comply. If the building does not comply, the evaluator shall check the "does not comply" column.

3. Comments. The evaluator shall specify how the building may be brought into compliance, or if other alternatives approved by the department have been utilized.

4. Not applicable. If a code section does not apply, write "NA" in each column.

(b) *Filing of life-safety evaluation form.* After completing the inspection and evaluation, the evaluator shall sign and date the life-safety evaluation form and submit the evaluation form to the department. Where a building does not comply with a specific item, the department shall issue written orders on these items and send notification to the school district.

Note: The evaluations for schools constructed between January 1, 1930, and January 1, 1950, were completed on January 1, 1990.

(4) INTERIM NOTIFICATION. On or before August 1, 1990, each school district having schools requiring compliance with life-safety plans shall notify the department in writing of what steps have been or will be taken to implement the life-safety standards.

(5) CERTIFICATE OF COMPLIANCE. Upon determination of compliance, the department shall certify in writing that the school complies with the life-safety standards. A copy of the reinspection report certificate shall be sent to the school district and the department of public instruction.

COMM 56.59 PLAN OF SCHOOL.

(1) FLOOR PLAN. The school district shall be responsible for preparing a floor plan of each school. The floor plan shall include:

(a) The size and use of all rooms;

(b) Location of all exit doors, exit lights, exit passageways and stairways;

(c) Location of toilet facilities; and

(d) Location of fire alarm horns and pull-stations.

(2) DATES OF CONSTRUCTION. The plan shall show the construction dates of the building and any additions.

COMM 56.60 PLANS AND SPECIFICATIONS.

Plans and specifications shall be submitted to the department in accordance with s. COMM 50.12 for any new construction, additions, changing location of exits, structural alterations, or major alterations. A completion statement shall be filed in accordance with s. COMM 50.10.

COMM 56.61 APPROVAL OF ALTERNATE LIFE-SAFETY PLAN.

(1) TYPES OF ALTERNATIVES.

(a) *Alternatives to smoke enclosures and smoke cut-offs.* Where the building configuration does not permit the installation of physical barriers to separate the stairway from the classroom and corridor areas, other alternatives approved by the department may be used. The alternatives may consist of providing a combination of the following items and shall be approved by the department:

1. Additional smoke detectors complying with NFPA 72;
2. Smoke ventilation systems;
3. Fire suppression systems complying with s. COMM 51.23; or other fire suppression systems not specified in s. COMM 51.23, when approved by the local fire department;
4. Standard exits in addition to the required exits to reduce the required travel distance; or
5. Other alternatives providing an equivalency to the rule.

(b) *Other alternatives.* Alternatives to any other life-safety standard may be used, if an equivalency to the life-safety standard is provided and is approved by the department.

(2) PLAN APPROVAL.

(a) *Plan submission.* Any alternative to a life-safety requirement shall be submitted to the department as a "Preliminary Design Consultation-Aging Schools" prior to preparing final plans and specifications to implement the life-safety plan.

(b) *Notification.* The department shall make a written determination on the alternate life-safety plan and return it to the school district.

COMM 56.62 RE-EVALUATION.

Re-evaluations for all public schools shall be performed every 5 years. This inspection shall be coordinated with the department of public instruction's standard audit inspection. The re-evaluation may be performed by the department or a registered architect or engineer.

COMM 56.63 LIFE-SAFETY STANDARDS.

Each existing school building as specified in this subchapter shall be surveyed and evaluated in accordance with the following minimum life-safety standards:

(1) MAXIMUM CAPACITIES. The maximum capacities for classrooms and spaces shall be determined in accordance with the following:

(a) Maximum capacities for auditoriums or gymnasiums shall comply with s. COMM 56.02 for the class of construction requirements.

(b) Classrooms and other instructional spaces shall comply with the maximum capacities specified in s. COMM 56.07.

(2) EXITING. The minimum exiting requirements shall be determined in accordance with the following:

(a) *Number of exits.* The total number of exits from each floor level and each building shall be determined on the basis of total aggregate exit width and distances to exit. Each building and each floor level shall be provided with at least 2 exits located as remote from each other as practical.

(b) *Type of exits.* At least 2 exits from each floor level shall lead directly to grade through standard exit doors, stairs, interior enclosed stairs, smokeproof stair towers, fire-rated exit corridors, passageways or ramps. One-half of the remaining exits may be horizontal exits or fire escapes. Fire escapes shall be limited to buildings not more than 2 stories in height except that existing fire escapes may remain.

1. Standard exit doors. Standard exit doors shall be a minimum of 3 feet 0 inches in width.

2. Exit stairs. All new constructed stairs shall conform to the requirements of s. COMM 51.16, except that handrails shall be provided on both sides. An outside weather-treated wood stairway may be used as a second exit from a building not more than 2 stories in height.

3. Enclosure of interior stairways. All exit stairways shall be enclosed in accordance with s. COMM 56.06 (2)(c) or separated from the classroom and corridor area with a stairway smoke-enclosure having a one-hour rating as specified in s. COMM 56.64.

4. Fire-rated exit corridors. All rated exit corridors required to satisfy limitations on exit distance shall be of not less than one-hour fire-resistive construction, unless the fire-resistive ratings indicated in Table 51.03-A for required exit corridor enclosures are more restrictive.

5. Exit ramps. The minimum width of exit ramps shall be determined in accordance with the requirements of s. COMM 56.07. The minimum width shall be not less than 3 feet 8 inches. Exit ramps, other than those required for the physically disabled, shall have a slope not exceeding 1:8. Ramp slopes exceeding 1:12 shall be provided with handrails. Ramps shall be provided with a slip-resistant finish.

6. Fire escapes. Fire escapes shall be constructed in accordance with the requirements of s. COMM 51.20.

(c) *Travel distance.*

1. Nonsprinklered. Travel distance to an exterior exit door, a required fire-resistive rated exit corridor, interior enclosed stairs, smokeproof stair tower, horizontal exit, or fire escape, from any point in a building accessible to the public, may not exceed 150 feet.

2. Sprinklered. Where an approved automatic fire sprinkler system is provided throughout the building, an increase in the travel distance specified in subd. 1 to 200 feet will be permitted.

(d) *Location of exits.*

1. Distribution. All exits shall be distributed to provide the best possible means of egress. The exits shall be located so that in case any exit is blocked at any point some other exit is accessible through public passageways at all times.

2. Auditoriums and gymnasiums. Exits serving auditoriums and gymnasiums which have a capacity exceeding 600 persons shall comply with s. COMM 56.06 (3)(c).

(e) *Classroom exiting.*

1. Classrooms with 50 or less persons. At least one exit is required from a classroom or other instructional spaces with a capacity of 50 persons or less, and the exit door shall be 3 feet 0 inches wide and may swing into the classroom.

2. Classrooms with 51-100 persons. At least 2 exits are required from classrooms or other instructional spaces with a capacity of 51-100 persons, and the exit doors shall be 3 feet 0 inches wide and shall swing toward the means of egress.

3. Classrooms with greater than 100 persons. At least 2 exits shall be provided from all classrooms or other instructional spaces having a capacity of more than 100 persons. The exits shall discharge directly to grade or to a public passageway which permits 2 directions of travel to the exterior. The exit width shall comply with s. COMM 56.06 and the doors shall swing toward the means of egress.

(f) *Exit width.* The total required exit width shall be provided in accordance with s. COMM 56.07.

(g) *Storage under stairs.*

1. Combustible construction. Stairways constructed of combustible materials may not have any type of material or equipment stored under the stairs.

2. Noncombustible construction. Stairways constructed of noncombustible material having a 2-hour fire-rating may have storage under the stairways. All openings shall be protected with fire-rated door assemblies as specified in s. COMM 51.047. A smoke detector shall be provided in each storage room under a stairway and the smoke detector shall activate an alarm audible in a normally occupied area or shall activate the building fire alarm.

(3) STAIRWAY HANDRAILS AND GUARDRAILS. Stairway handrails and guardrails shall be provided in accordance with the following:

(a) *Handrails.* Handrails shall be not less than 30 inches nor more than 34 inches above the nosing of the treads on stairways or above the surface of ramps, as specified in s. COMM 51.161.

(b) *Guardrails.* Guardrails shall be provided on the open side of elevated platforms, landings, walks, balconies and mezzanines which are more than 24 inches in height. Guardrails shall not be less than 42 inches in height.

(4) EXIT SIGNS. Exit signs shall be provided in accordance with the following:

(a) Illuminated exit signs shall identify all required exits, as specified in s. COMM 56.06.

(b) Directional exit signs shall be located to direct occupants to the exits.

(5) CORRIDORS.

(a) *Corridor width.* All public corridors and passageways shall have an unobstructed width of at least 4 feet.

(b) *Dead-end corridors.*

1. Locked security gates and doors may not be placed so as to block required exit passageways or create dead-end corridors.

2. At least 2 directions of egress shall be provided from every room. Any room may be permitted one direction of egress provided the door setback from 2 directions of egress is not greater than the corridor width. The total number of persons beyond the 2 directions of egress may not exceed 50.

(6) FIRE DETECTION, PROTECTION AND SUPPRESSION. The manual fire alarm system, basement fire protection and portable fire extinguishers shall comply with the following:

(a) *Manual fire alarm system.* At least one fire alarm pull station shall be provided at each exit on each floor to activate the building fire alarm system. The manual fire alarm system shall be audible throughout the floor level.

(b) *Basement protection.* All basement corridors shall be protected with an automatic smoke detection system.

(c) *Portable fire extinguishers.* Portable fire extinguishers shall be located every 75 feet, or there shall be no more than 11,250 square feet per extinguisher as specified in NFPA 10. The extinguishers shall be charged or filled.

(7) CONSTRUCTION SEPARATION WALL.

(a) *Openings used as standard exits.* If the opening in a construction separation wall is a required exit, the opening shall be provided with exit doors complying with s. COMM 51.15 and the doors shall have a 3/4-hour fire-rating as specified in s. COMM 51.047.

(b) *Existing rolling or sliding fire-doors.* Existing rolling or sliding fire-rated doors held open by a fusible link may remain as is, except as separate smoke detector shall be placed at these door locations. The smoke detector shall not be connected with the rolling or sliding fire-rated doors.

(8) ISOLATION OF HAZARDS.

(a) *Rating of enclosures.* All fuel-fired heating boilers and furnaces, power boilers, fuel rooms, breeching, storage vaults for paints, oils and similar hazards, fuel-fired kilns and dryers, and other similar hazards shall be enclosed with the following:

1. The enclosures located in one story buildings shall be protected with 2-hour fire-rated construction or equivalent.

2. The enclosures located in buildings greater than one story in height shall be protected with 4-hour fire-rated construction or equivalent.

(b) *Protection of openings.* All openings in these enclosures shall be protected with self-closing doors as specified in s. COMM 51.047.

(9) MECHANICAL EQUIPMENT. The heating and ventilating equipment shall comply with the following:

(a) Outside combustion air shall be provided as specified in s. COMM 64.09.

(b) Air handling units servicing more than one floor level shall be provided with a smoke detection system capable of detecting products of combustion in the ductwork and a means of shutting down the system or stopping the flow of air upon activation of smoke detectors in the ducts. The smoke detectors shall comply with the following:

1. Smoke detectors approved for duct installation shall be installed at a suitable location in:

a. The main supply duct on the downstream side of the filters to automatically stop the fan; and

b. The return air stream, prior to exhausting from the building or being diluted by outside air, to automatically exhaust the smoke-laden return air or to stop the fan. The smoke detector may be omitted in the return air stream in systems of less than 15,000 cubic feet per minute.

2. Smoke detectors shall be installed in accordance with NFPA 72. Activation of smoke detectors shall sound an alarm audible in a normally occupied area of the building or shall activate the building fire alarm system.

(10) STRUCTURAL ANALYSIS. A structural analysis will be required if any visible defects are found in:

(a) Columns;

(b) Beams and framing;

(c) Floor system;

(d) Roof deck and supports;

(e) Exterior walls; or

(f) Foundation walls.

(11) ELECTRICAL. The electrical systems shall be inspected in accordance with the following:

(a) Conductors shall be protected against physical damage;

(b) Working space in front of equipment shall be kept clear;

(c) Proper overcurrent protection shall be provided; and

(d) Flexible cords shall be properly used.

COMM 56.64 STAIRWAY SMOKE-ENCLOSURE.

(1) WHERE REQUIRED.

(a) Where stairway smoke-enclosures are required, they shall be installed to separate all open stairways from all other areas of the building in order to limit the spread of smoke and fumes into the stairways. Stairways leading to open balconies or mezzanines may remain open.

(b) Where it is impossible to construct a one-hour fire-rated stairway smoke-enclosure to separate the open stairway, the department will consider:

1. Stairway smoke cut-offs as specified in s. COMM 56.65; or
2. Horizontal separations as specified in s. COMM 56.66.

(2) CONSTRUCTION.

(a) *Smoke-enclosure wall.* The wall of the stairway smoke-enclosure shall extend vertically from the finished floor to the underside of a floor/ceiling deck or ceiling/roof deck and extend horizontally from wall-to-wall.

(b) *Rating of smoke-enclosure wall.* The stairway smoke-enclosure wall which is located in a building classified as type 1, 2 or 3 construction in accordance with s. COMM 51.03 (1) to (3) shall be constructed of at least one-hour noncombustible elements. The stairway smoke-enclosure wall which is located in a building classified as type 4, 5, 6, 7 or 8 in accordance with s. COMM 51.03 (4) to (8) shall be constructed of material having at least a one-hour fire-resistive rating.

(c) *New and replacement door assemblies in a smoke-enclosure wall.*

1. New and replacement door assemblies in a stairway smoke-enclosure wall shall have a 3/4-hour fire-rating and be self-closing. The frame, hardware, hinges, lock sets and closers shall be listed for use with fire-rated doors by U.L., Factory Mutual or other approved testing laboratories.

2. A fire-rated door shall be self-closing and shall remain closed at all times, unless the door is equipped with an automatic self-closing device activated by products of combustion other than heat, or a self-closing device activated by the building fire alarm system.

(d) *Existing doors and frames located in openings in smoke-enclosure walls.* Any framed opening in an existing wall of a stairway shall be equipped with at least a 3/4-hour rated door and the hardware specified in par. (c). Existing doors, frames and light-panel frames located in the existing stairway enclosure walls may remain as is, provided:

1. The door is solid wood core;
2. The door is equipped with self-closing and latching devices;
3. Any transfer grille located in the door is eliminated and the opening is filled with solid wood that is at least as thick as the door;
4. Any glazing in the door is wired glass;
5. Any glazed transom above the door is wired glass; and
6. The existing frame is metal or solid wood at least 3/4-inch thick.

(e) *Platform.* The stairway smoke-enclosure shall be constructed to provide a platform between the smoke-enclosure and the stairs. The platform shall be at least as wide as the stairway, measured at a right angle to the direction of travel. Every platform shall have a length of at least 3 feet, measured in the direction of travel. The swing of the exit doors may not block the required exit passageway.

(f) *Penetrations.* Any opening around a duct, pipe, conduit or wiring penetrating through a stairway smoke-enclosure wall shall be filled solidly with draft stopping material in accordance with s. COMM 53.63 (1).

(3) SMOKE DETECTION.

(a) Where a stairway smoke-enclosure does not provide direct exiting to grade, the passageway connecting the stairway smoke-enclosure to the exterior exit shall be protected with smoke detectors. The detectors shall be located in accordance with NFPA 72.

(b) The smoke detectors shall activate alarms audible in a normally occupied area of the building or shall activate the building fire alarm system.

COMM 56.65 STAIRWAY SMOKE CUT-OFFS.

(1) WHERE REQUIRED. Where stairway smoke cut-offs are required, they shall be constructed at all open stairways at the basement level and all other floor levels other than the first or ground floor.

(2) CONSTRUCTION. The construction of the stairway smoke cut-off shall comply with s. COMM 56.64 (2).

(3) SMOKE DETECTION.

(a) Where stairway smoke cut-offs are provided, at least one smoke detector shall be placed at the head of the open stairway at the uppermost floor level. Additional smoke detectors shall be placed throughout the open corridor leading to the stairway. The smoke detectors shall be located in accordance with NFPA 72.

(b) The smoke detectors shall activate alarms audible in a normally occupied area of the building or shall activate the building fire alarm system.

COMM 56.66 HORIZONTAL SEPARATIONS.

(1) WHERE REQUIRED. Horizontal separations may be used to subdivide a floor into at least 2 smoke compartments, provided the building is classified as type 6 metal frame unprotected construction in accordance with s. COMM 51.03 (6) or better construction with noncombustible floors and stairways. Horizontal separations may be used as horizontal exits.

(2) CONSTRUCTION. Horizontal separations shall have at least a one-hour fire-resistive rating. Openings in the horizontal separations shall be protected with door or window assemblies having a 3/4-hour fire-resistive rating.

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Chapter COMM 57

RESIDENTIAL OCCUPANCIES

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Subchapter I — General Standards for Residential Occupancies

COMM 57.001 SCOPE.

(1) COMM 57.001 GENERAL. Except as provided in sub. (2), this subchapter applies to all places of abode, including, but not limited to:

(a) Apartment buildings, residential condominium, and townhouses, that exceed 60 feet in height or six stories;

(b) Motels;

(c) Hotels;

(d) Dormitories;

(f) Sheltered facilities for battered women, as specified in s. 46.95, Stats., serving more than 20 occupants;

(g) Rooming houses;

(h) Convents and monasteries;

(i) Community-based residential facilities serving 9 or more unrelated adults; and

(j) Community-based facilities located in existing buildings serving more than 20 unrelated adults.

In addition to the occupancies listed, based on the definition of place of abode found in COMM 51.01 (102)(a), a building occupied as a residence by two families and also used for business purposes will fall under the scope of this chapter.

Unsecured Correctional Facilities: *Another facility which may be included under the scope of chapter 57 is the minimum security/work release/Huber facilities which are not provided with locking hardware on egress doors. Although they may be governed or operated by the Department of Corrections, such a facility is not necessarily required to be reviewed as a detention facility under the scope of Chapter 58, Subchapter II, when egress is not secured.*

If such a facility is proposed, the owner must be aware of the limitations associated with such a design as well as those requirements (such as complete automatic sprinkler protection) of the Department of Corrections which may be more stringent and must also be complied with. Also included are buildings which may be used primarily by children such as, but not limited to, the "bunk houses/lodges" at boy scout and girl scout camps or "CCIs" (Child Care Institutions). Buildings used for sleeping by children and having a capacity of nine or more fall under the scope of this chapter.

Hospice Care: *A hospice care facility is licensed to provide a level of care between that of a CBRF and that of a nursing home. Although hospice care facilities provide nursing care, it is that care provided to assist in the abatement of pain and discomfort, not the nursing care necessary to sustain or prolong life. That differentiation in care is not included in the definition of nursing home.*

Hospice care facilities are reviewed under the scope of Chapter COMM 57. Because the licensing agency has "more stringent" requirements in their rules (HSS 131) governing such a facility, the designer should be in contact with the Department of Health and Family Services, Division of Health, to facilitate compliance with all requirements.

Note: See s. COMM 51.01 (102a) and 51.01 (114a) for the definitions of the terms "places of abode" and "rowhouse", respectively.

(2) EXEMPTIONS. This subchapter does not apply to the following:

(a) One- and 2-family dwellings;

(b) Buildings or motels, tourist courts and similar occupancies having separate buildings containing not more than 2 rental units each;

(c) Migrant labor camps;

(d) Health care facilities;

(e) Places of detention;

(f) Community-based residential facilities constructed on or after the effective date of this section and serving 3 to 8 unrelated adults;

(g) Community-based residential facilities, serving 9 to 20 unrelated adults, located in existing buildings as specified in ss. COMM 61.001 (1) and 61.01 (7);

(h) Sheltered facilities for battered women, as specified in s. 46.95, Stats., serving 20 or less occupants as specified in s. COMM 61.001 (3);

(i) Bed and breakfast establishments as defined in s. COMM 51.01 (11a); and

(j) Multifamily dwellings within the scope of ch. COMM 66.

Other Codes: *Although exempt from the requirements under the scope of Chapter COMM 57, most of the occupancies listed above are subject to rules found elsewhere. One- and two-family dwellings and motels, tourist courts, and similar occupancies having separate buildings containing not more than two rental units each are subject to the requirements of the Uniform Dwelling Code. Migrant labor camps are subject to the rules of the Department of Worker Development, Job Service Division. Health care facilities and places of detention are subject to the requirements of COMM 58 and requirements enforced by the Department of Health and Family Services. Community Based Residential Facilities (CBRF) serving three to eight residents are subject to the requirements of the Department of Health and Family Services. Other CBRFs and sheltered facilities for battered women are subject to the requirements of the Department of Health and Family Services as well as Chapter COMM 61. Bed and breakfast establishments are subject to the rules of the Hotel and Restaurant Section of the Department of Health and Family Services. Even if the Department of Health and Family Services determines that a building is a bed and breakfast establishment, it still must meet the requirements of s. Comm 51.01(11a) to be exempt from the rules of the Dept. of Commerce. If the Department of Health and Family Services decides to not issue a license as a bed and breakfast establishment, the building is subject to the requirements of Chapter COMM 57.*

Single Living Unit in a Commercial Building: *If a single living unit is located in a building used for commercial purposes, it is not reviewed under the scope of this chapter. There are no code requirements in Chapters COMM 50-64 applicable to the single unit occupancy. However, the effect of the single unit on the commercial occupancy must be considered. Fuel-fired equipment and garages must be separated from the commercial occupancy in accordance with the chapter governing the commercial occupancy by means of an enclosure of the equipment or an occupancy separation between the commercial occupancy and the single living unit. The rating of the enclosure or occupancy separation will be as required under the isolation of hazards section or garage separation sections applicable to the commercial occupancy. If the single unit is located on an upper floor level, the floor system for the living unit must be designed in accordance with the live load requirements applicable to residential occupancies found in Chapter COMM 53 and the roof must support either the 30 or 40 pounds per square foot live load plus drift load. The upper living unit will be considered a story and the enclosing walls of the living unit will be considered when determining class of construction of the building for purposes of meeting height and area limitations applicable to the commercial occupancy.*

Specific code requirement governing exiting, HVAC, windows, etc., for the single living unit may be governed by the Uniform Dwelling Code and will not be addressed during the commercial building plan review process.

A single living unit attached to a Chapter 57 residential occupancy does fall under the scope of Chapter COMM 57. The owner's private residence attached to a motel is considered as another unit in the building and must be in conformance with the requirements applicable to living units as set forth in Chapters COMM 50-64.

Note: See chs. COMM 20-25, Uniform Dwelling Code for requirements regarding one- and 2-family dwellings. The requirements of chs. COMM 20-25 also apply to newly constructed community-based residential facilities serving 3 to 8 unrelated adults.

Note: See ch. DWD 301, for requirements regarding migrant labor camps.

COMM 57.01 CONSTRUCTION.

(1) GENERAL. For the purpose of determining the maximum height and area of buildings and structures within the scope of this chapter, the building construction shall be classified in accordance with the construction standards as specified in s. COMM 51.03.

Note: See ss. HSS 3.40-3.65, Wis. Adm. Code, for additional construction requirements pertaining to community-based residential facilities.

(2) LIVING UNIT SEPARATION.

(a) Each living unit, except rowhouse units as specified in s. COMM 51.01 (114a), shall be separated from other living units, common use areas and from the exit access corridors by construction protected with at least the equivalent of one layer of 5/8-inch Type X gypsum wallboard with taped joints.

The department will accept other fire-coded drywall and drywall with a thickness of less than 5/8 inch if the product testing verifies it is equivalent to 5/8-inch Type X drywall.

1. The fire-protective membrane shall be provided on both sides of walls and on the ceiling beneath the floor construction providing the separation. The membrane shall be fastened to the framing or suspended in the manner as required for one-hour fire-resistive rated assemblies.

2. The membrane protection may be omitted on the ceiling of the top-most story if firestopping as specified in s. COMM 53.63 (1)(d) is provided at the intersection of the living unit separation walls and the roof.

Rooming Houses: *When reviewing rooming house plans, consider each room as a separate unit for determination of number of units and for establishing exiting requirements. Also, each room will be considered a separate sleeping area for smoke detector location requirements. Consider a block of four rooms as one unit only for application of COMM 57.01 (2) living unit separation.*

Question: *For living unit separation, the ceiling of the lower unit must be protected with at least the equivalent of one layer of 5/8-inch Type X gypsum wallboard with taped joints. The membrane shall be fastened to the framing or suspended in the manner as required for 1-hour fire-resistive rated assemblies.*

When the floor/ceiling system uses trusses, does the living unit separation need to include furring strips, resilient channels, multiple layers of drywall, etc., as required for the selected 1-hour assembly method of attachment?

Answer: First it is important to clearly distinguish whether the membrane is used for living unit separation only or if an actual fire-resistive assembly is required for class of construction or some other purpose. *For instance in Type 7 construction the intent of the code is to protect the truss so that it will not fail in the event of fire for at least one hour; thus, a full 1-hour assembly is*

required. Coincidentally the requirement for living unit separation is also met by a 1-hour system using the equivalent of 5/8-inch drywall for the lower membrane. In Type 8 construction, the floor ceiling system is not required to be rated. The code intent is not to provide fire protection for the truss but to provide a barrier between units.

*When an actual fire-resistive assembly is **not** required for ceiling construction, the ceiling separation between living units shall be at least one layer of 5/8-inch Type X gypsum wallboard or equivalent, with taped joints, attached to supports spaced as specified by a tested, listed drywall assembly and fastened by nails, screws or other connectors spaced and embedded to properly support the membrane as per the selected rated assembly.*

3. a. The annular space around ducts, pipes, and conduits or other penetrating items that penetrate fire-protective membranes required under this paragraph shall be protected as specified in s. Comm 51.049.

b. For the purpose of protecting the annular spaces under subpar. a., the methods of protection shall be the same as the membranes for at least a one-hour rated assembly.

Note 1: See s. COMM 51.03 for building elements required to have fire-resistive ratings to satisfy class of construction standards.

Note 2: This section is intended to apply to living unit separations only. The design and construction of required fire-resistive rated construction for stairway enclosures, hazardous occupancy separations, exit corridors, isolation of hazards enclosures, vertical division walls, fire division walls and other rated construction is governed by ss. COMM 51.043 to 51.046.

Per s. Comm 57.01(2)(a), the living unit separation only includes the ceiling membrane of a floor/ceiling assembly separating two units. Therefore, penetrations of the floor sheathing of such a separation do not require firestopping.

(b) Doors separating one hotel or motel living unit from another shall have a 3/4-hour fire-resistive rating. The connecting doors are not required to be equipped with self-closing devices.

In the case of a bath shared by two units, at least one of the doors entering the bath or connecting corridor shall be 45 minute rated.

(3) BASEMENT AND GROUND FLOOR PROTECTION.

(a) Except as provided in par. (b), the ceiling of all spaces, except those within individual living units and crawlspaces located below the first story of all residential buildings, shall be protected with at least the equivalent of one layer of 5/8-inch type X gypsum wallboard with taped joints.

(b) This subsection shall not apply to buildings where such spaces are protected by an approved automatic sprinkler system.

(4) GARAGE SEPARATIONS. A residential occupancy shall be separated from a storage garage or repair garage in accordance with s. COMM 51.08.

Chapter COMM 59 will not permit a garage of Type 8 construction to be more than one story. This poses a problem with respect to multistory, frame residential buildings with a basement or lower level garage. The department will accept lower level garages in multistory, frame residential buildings provided an occupancy separation of at least three hours is provided between the garage and residential portion of the building. All supports for the 3-hour occupancy separation must also

*be 3-hour rated. The department will **not** permit a reduction in this 3-hour rated separation based on complete sprinkler protection of the building.*

COMM 57.015 HEIGHT OF FIRST FLOOR ABOVE GRADE FOR SHELTERED FACILITIES FOR BATTERED WOMEN.

The elevation of the first floor and the sills of all required exit discharges from the first floor for existing buildings to be converted to sheltered facilities for battered women shall be at or not more than 6 feet above an exit discharge grade.

COMM 57.016 AUTOMATIC FIRE SPRINKLER PROTECTION.

A building more than 60 feet in height shall be protected throughout the entire building in accordance with ss. COMM 52.01 and 51.23, except that the sprinklers within the living units shall be either a residential type conforming to NFPA 13R, or a quick response type installed in accord with the recommendations and requirements of the manufacturer.

Quick response heads should be spaced as per the manufacturer's recommendation.

COMM 57.016 CBRFs licensed for more than 16 residents require a complete NFPA 13 sprinkler system with residential quick response heads. Please refer to DHSS 83.43.

COMM 57.02 ALLOWABLE HEIGHT AND AREA.

(1) GENERAL. Buildings and structures within the scope of this chapter shall not exceed the height and area limitations specified in this section.

(2) ALLOWABLE INCREASE IN FLOOR AREAS.

(a) *Limited area ch. COMM 57 buildings.*

1. Chapter COMM 57 buildings not protected by automatic fire sprinkler systems as specified in s. COMM 57.016 may not exceed the height and area limitations specified in Table 57.02-1.

2. A building may not exceed the height and area limitations specified in Table 57.02-2 if the building is protected by an automatic fire sprinkler system conforming with NFPA 13R.

Note: NFPA standard 13R applies only to buildings 4 stories or less in height.

3. A building may not exceed the height and area limitations specified in Table 57.02-3 if the building is protected by an automatic fire sprinkler system conforming with NFPA 13, except that the sprinklers within the living units shall be either a residential type conforming to NFPA 13R, or a quick response type installed in accord with the recommendations and requirements of the manufacturer.

***Area limits** are based on three conditions: unsprinklered, partial sprinkler, and fully sprinklered, all of which are in tabular form. A problem arises when submitters are not specific enough regarding "partial sprinkler" systems which are being installed. Plan examiners will not be able to determine which of the area tables is appropriate unless the appropriate sprinkler category box on the applicaiton form is checked.*

(b) *Vertical division wall separations.*

1. No building shall be limited in area when divided into sections which do not exceed the maximum areas tabulated in this section by vertical division walls. Such vertical division walls shall extend from the foundation or the first floor level if the floor construction and supporting elements are of 3-hour rated non-combustible construction, to the underside of the roof deck and shall have at least the following fire-resistive ratings:

   a. 2-hour for type 4, 5A, 5B, 7 and 8 construction;

   b. NC-2 hour for type 3 and 6 construction; and

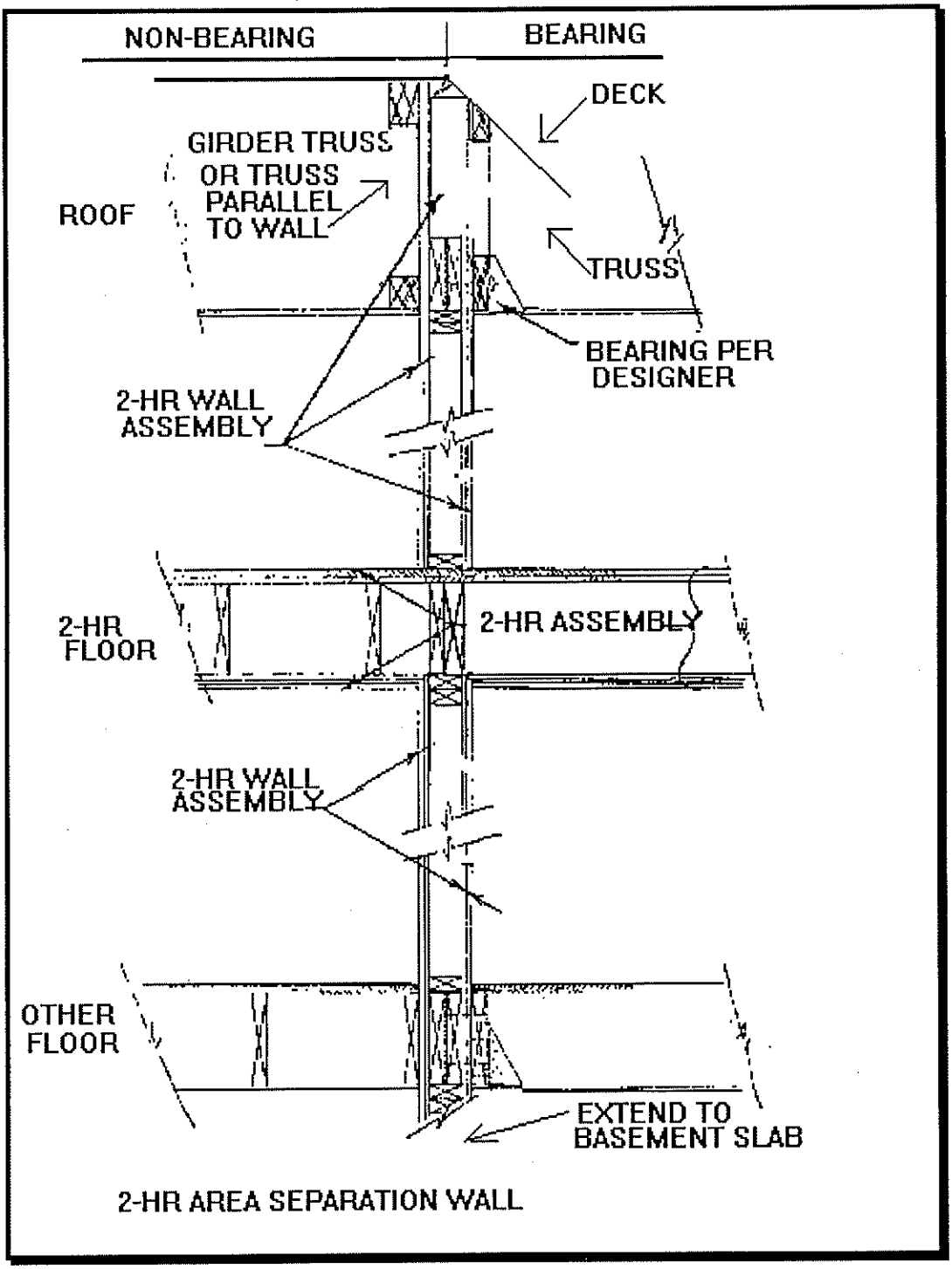
   c. NC-3 hour for type 1 and type 2 construction.

The intent of 57.02 (2)(b) is to divide a building into allowable areas by firewalls which will not allow a fire to spread from one section of the building to another for a specified time. The firewall is required to extend through the building from exterior wall to exterior wall. Once this is accomplished, each building section is considered as a separate building for fire prevention purposes. COMM Tables 51.03-A and B then govern the wall ratings and percent of allowed openings in the vicinity of the firewall.

For a two-hour rated separation walls, the outside membranes of the walls must be continuous or the horizontal structural element penetrating the membrance must carry a two-hour fire-resistive rating.

Two-hour rated area separation walls constructed in accordance with the construction/framing details shown in the attached figures may be used for area separation class of construction and number of stories purposes as specified in s. COMM 57.02 (2)(b), provided the use on both sides of the division wall falls under Ch. 57.

(THE FOLLOWING DIAGRAM IS COMMENTARY)



Question: *Typical apartment buildings with basement garages are constructed with a 3-hour rated garage ceiling which supports 2-hour area division walls as allowed by COMM 57.02 (2)(b). If the building is completely sprinklered due to local ordinances, may this 3-hour rating be reduced as allowed by COMM 51.02 (22)?*

Answer: *No, COMM 51.02 (22) reductions do not apply to the 3-hour requirement for the first floor system as specified in COMM 57.02 (2)(b).*

Question: *If a building is required to be completely sprinklered and the building has a 3-hour rated noncombustible first floor over a parking garage as allowed per COMM 57.02 (2)(b), is the garage also required to be sprinklered?*

Answer: *Yes, the garage must also be protected by an automatic fire sprinkler system.*

2. All openings in such walls shall be protected by fire-rated door assemblies as specified in s. COMM 51.047. The doors protecting openings in such walls located in public corridors shall be held open and equipped with an automatic closing device activated by products of combustion other than heat.

(c) *Street access for unlimited area buildings.*

1. Streets shall be within 50 feet of the adjacent building side with no obstructions between the street and the building which will impede fire-fighting efforts.

Note: See s. COMM 51.01 (124) for definition of street.

2. a. Buildings with no area limitations as permitted under Table 57.02-3, shall have a continuous all-weather, hard-surfaced area 30 feet or more in width for a distance of not less than 50% of the perimeter of the building. These buildings shall have at least one wall facing a street for its entire length. At least 2 of the remaining building walls shall face streets for at least 50% of their respective lengths.

b. Unlimited area buildings of fire-resistive type 1 construction and one-story unlimited area buildings of fire-resistive type 2 construction shall be provided with street access as defined in s. COMM 51.01 (124) to at least one side of the building.

(3) ACCESS ROADWAYS FOR FIRE APPARATUS.

(a) Buildings shall be accessible to fire department apparatus by means of streets as specified in s. COMM 51.01 (124) or access roadways. Access roadways shall be at least 20 feet in width, be capable of supporting the imposed loads of the fire apparatus and have a minimum of 13 feet 6 inches in vertical clearance.

TABLE 57.02-1

ALLOWABLE HEIGHT (STORIES) AND AREA (SQUARE FEET) FOR BUILDINGS WITHOUT COMPLETE AUTOMATIC FIRE SPRINKLER SYSTEM PROTECTION (MAXIMUM GROSS FLOOR AREA PER FLOOR)

NOTE: DO NOT USE FOR BUILDINGS EXCEEDING 60 FEET IN HEIGHT

Class of Construction	Open Space at Least 30 Feet in Width or Street Within 50 Feet of the Building	Number of Stories								
		1	2	3	4	5	6	7	8	Over 8
1. Fire-Resistive Type A	1	19,800	17,000	14,800	12,500	10,300	8,800	7,300	6,500	5,300
	2	23,900	20,800	18,500	15,900	13,600	11,800	10,300	9,500	8,300
	3	28,000	25,300	22,300	19,300	17,000	14,800	13,300	12,500	11,300
	4	32,100	29,800	26,000	22,600	20,400	17,800	16,300	15,500	14,300
2. Fire-Resistive Type B	1	17,800	15,000	12,800	10,500	8,300	6,800	5,300	4,500	
	2	21,900	18,800	16,500	13,900	11,600	9,800	8,300	7,500	N.P.
	3	26,000	23,300	20,300	17,300	15,000	12,800	11,300	10,500	
	4	30,100	27,800	24,000	20,600	18,400	15,800	14,300	13,500	
3. Metal Frame Protected	1	15,800	13,500	11,300	9,000					
	2	19,900	17,300	14,600	12,000	N.P.	N.P.	N.P.	N.P.	N.P.
	3	24,000	21,000	18,000	15,000					
	4	28,100	24,800	21,400	18,000					
4. Heavy Timber	1	12,800	10,500	7,400	6,800					
	2	16,500	14,300	12,000	10,100	N.P.	N.P.	N.P.	N.P.	N.P.
	3	20,300	18,000	15,800	13,500					
	4	24,000	21,800	19,500	16,900					
5A. Exterior Masonry Protected	1	11,600	9,600	7,200	6,000					
	2	15,000	12,800	10,700	8,800	N.P.	N.P.	N.P.	N.P.	N.P.
	3	18,400	16,100	13,900	11,600					
	4	21,800	19,500	17,100	14,500					
5B. Exterior Masonry Unprotected	1	10,500	8,600	6,800						
	2	13,500	11,300	9,400	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	16,500	14,300	12,000						
	4	19,500	17,300	14,600						
6. Metal Frame Unprotected	1	10,500	8,600	6,800						
	2	13,500	11,300	9,400	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	16,500	14,300	12,000						
	4	19,500	17,300	14,600						
7. Wood Frame Protected	1	10,500	8,600	6,800						
	2	13,500	11,300	9,400	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	16,500	14,300	12,000						
	4	19,500	17,300	14,600						
8. Wood Frame Unprotected	1	7,500	3,800							
	2	9,000	4,500	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	10,500	5,300							
	4	12,000	6,000							

N.P. means Not Permitted

TABLE 57.02-2
ALLOWABLE HEIGHT (STORIES) AND AREA (SQUARE FEET) FOR BUILDINGS PROTECTED IN ACCORDANCE WITH NFPA 13R
(MAXIMUM GROSS FLOOR AREA PER FLOOR)
NOTE: USE FOR ALL BUILDINGS

Class of Construction	Open Space at Least 30 Feet in Width or Street Within 50 Feet of the Building	Number of Stories								
		1	2	3	4	5	6	7	8	Over 8
1. Fire-Resistive Type A	1	39,600	34,000	29,600	25,000					
	2	47,800	41,600	37,000	31,800	N.A.	N.A.	N.A.	N.A.	N.A.
	3	56,000	50,600	44,600	38,600					
	4	64,200	59,600	52,000	45,200					
2. Fire-Resistive Type B	1	35,600	30,000	25,600	21,000					
	2	43,800	37,600	33,000	27,800	N.A.	N.A.	N.A.	N.A.	N.A.
	3	52,000	46,600	40,600	34,600					
	4	60,200	55,600	48,000	41,200					
3. Metal Frame Protected	1	31,600	27,000	22,600	18,000					
	2	39,800	34,600	29,200	24,000	N.P.	N.P.	N.P.	N.P.	N.P.
	3	48,000	42,000	36,000	30,000					
	4	56,200	49,600	42,800	36,000					
4. Heavy Timber	1	25,600	21,000	14,800	13,600					
	2	33,000	28,600	24,000	20,200	N.P.	N.P.	N.P.	N.P.	N.P.
	3	40,600	36,000	31,600	27,000					
	4	48,000	43,600	39,000	33,800					
5A. Exterior Masonry Protected	1	23,200	19,200	14,400	12,000					
	2	30,000	25,600	21,400	17,600	N.P.	N.P.	N.P.	N.P.	N.P.
	3	36,800	32,200	27,800	23,200					
	4	43,600	39,000	34,200	29,000					
5B. Exterior Masonry Unprotected	1	21,000	17,200	13,600						
	2	27,000	22,600	18,800	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	33,000	28,600	24,000						
	4	39,000	34,600	29,200						
6. Metal Frame Unprotected	1	21,000	17,200	13,600						
	2	27,000	22,600	18,800	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	33,000	28,600	24,000						
	4	39,000	34,600	29,200						
7. Wood Frame Protected	1	21,000	17,200	13,600						
	2	27,000	22,600	18,800	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	33,000	28,600	24,000						
	4	39,000	34,600	29,200						
8. Wood Frame Unprotected	1	15,000	7,600							
	2	18,000	9,000	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	21,000	10,600							
	4	24,000	12,000							

N.P. means Not Permitted N.A. means Not Applicable

TABLE 57.02-3
ALLOWABLE HEIGHT (STORIES) AND AREA (SQUARE FEET) FOR BUILDINGS PROTECTED IN ACCORDANCE WITH NFPA 13
(MAXIMUM GROSS FLOOR AREA PER FLOOR)
NOTE: USE FOR ALL BUILDINGS

Class of Construction	Open Space at Least 30 Feet in Width or Street Within 50 Feet of the Building	Number of Stories									
		1	2	3	4	5	6	7	8	9	Over 9
1. Fire-Resistive Type A	1										
Stories and area may be	2					No Limit					
unlimited subject to	3										
s. COMM 57.02 (2)(c) 2.	4										
2. Fire-Resistive Type B	1		53,400	45,000	38,400	31,500	24,900	20,400	15,900	13,500	
1 to 9 story area may be	2	No Limit	65,700	56,400	49,500	41,700	34,800	29,400	24,900	22,500	N.P.
unlimited subject to	3		78,000	69,900	60,900	51,900	45,000	38,400	33,900	31,500	
s. COMM 57.02 (2)(c) 2.	4		90,300	83,400	72,000	61,800	55,200	47,400	42,900	40,500	
3. Metal Frame Protected	1	63,200	47,400	40,500	33,900	27,000					
1 to 5 story area may be	2	79,600	59,700	51,900	43,800	36,000	N.P.	N.P.	N.P.	N.P.	N.P.
unlimited subject to	3	96,000	72,000	63,000	54,000	45,000					
s. COMM 57.02 (2)(c) 2.	4	112,400	84,300	74,400	64,200	54,000					
4. Heavy Timber	1	51,200	38,400	31,500	22,200	20,400					
1 to 3 story area may be	2	66,000	49,500	42,900	36,000	30,300	N.P.	N.P.	N.P.	N.P.	N.P.
unlimited subject to	3	81,200	60,900	54,000	47,400	40,500					
s. COMM 57.02 (2)9c) 2.	4	96,000	72,000	65,400	58,500	50,700					
5A. Exterior Masonry Protected	1	46,400	34,800	28,800	21,600	16,000					
1 to 3 story area may be	2	60,000	45,000	38,400	32,100	26,400	N.P.	N.P.	N.P.	N.P.	N.P.
unlimited subject to	3	73,600	55,200	48,300	41,700	34,800					
s. COMM 57.02 (2)(c) 2.	4	87,200	65,400	58,500	51,300	43,500					
5B. Exterior Masonry Unprotected	1	42,000	31,500	25,800	20,400						
1 story area may be	2	54,000	40,500	33,900	28,200	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
unlimited subject to	3	66,000	49,500	42,900	36,000						
s. COMM 57.02 (2)(c) 2.	4	78,000	58,500	51,900	43,800						
6. Metal Frame Unprotected	1	42,000	31,500	25,800	20,400						
1 story area may be	2	54,000	40,500	33,900	28,200	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
unlimited subject to	3	66,000	49,500	42,900	36,000						
s. COMM 57.02 (2)(c) 2.	4	78,000	58,500	51,900	43,500						
7. Wood Frame Protected	1	42,000	31,500	25,800	20,400						
	2	54,000	40,500	33,900	28,200	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	66,000	49,500	42,900	36,000						
	4	78,000	58,500	51,900	43,800						
8. Wood Frame Unprotected	1	30,000	22,500	11,400							
	2	36,000	27,000	13,500	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
	3	42,000	31,500	15,900							
	4	48,000	36,000	18,000							

N.P. means Not Permitted

1. For buildings 3 stories or less in height, the street or access roadway shall:

a. Be located within 150 feet of all portions of the exterior walls of the first story as measured along the perimeter of the building; or

Where this option is utilized, a court must be provided to allow hose access to the exterior walls.

b. Extend along at least one entire side of the building which constitutes at least 25% of the total building perimeter with the road edge closest to the building located at least 10 feet but not more than 50 feet from the building.

2. For buildings more than 3 stories in height, the street or access roadway shall extend along at least one entire side of the building which constitutes at least 25% of the total building perimeter with the road edge closest to the building at least 10 feet but not more than 50 feet from the building.

(b) The required streets and access roadways shall be kept free at all times of all obstructions, including parked vehicles and snow.

Since the intent of the rule is to provide access to the building as needed by the local fire department, the division will accept means of fire department access to buildings which do not conform to the specific letter of these sections provided the local fire department submits a letter of approval/acceptance for the specific access provided to the department.

See COMM 51.01 (124) commentary.

Question: *The department has, by interpretation, allowed 4-hour fire division walls to be counted as streets. Can 2-hour rated walls utilized as Chapter 57 area division walls also be counted as streets.*

Answer: *Two-hour area division walls may* ***not*** *be counted as streets.*

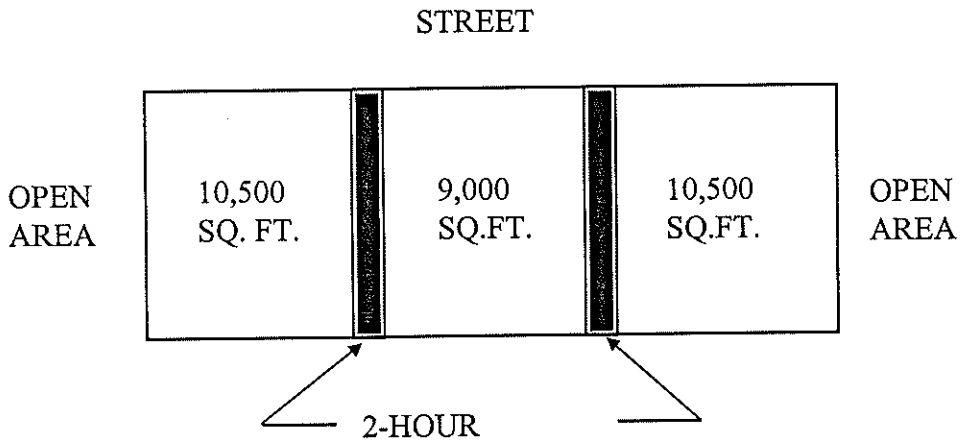
Streets are provided to allow fire departments to fight a fire from several directions. If a building is divided by a fire wall, the fire department can approach a fire over the roof of the uninvolved portion of the building, and, even through the uninvolved floor levels of the building. The fire department personnel are assured of a degree of safety and protection from the fire by the massive (typically 12-inch masonry) wall and 3-hour fire door assemblies. A 2-hour fire wall is typically constructed of studs and drywall or lighter masonry. This separation does not provide the protection to the firefighters necessary for them to enter into or onto the roof of the uninvolved portion of the building. Therefore, only 4-hour firewalls, constructed in accordance with 51.02 (13) should be counted as streets.

The area limitation tables are based upon the number of sides a building has facing streets or open areas. Each building and each building section must have at least one side which faces a street complying with COMM 51.01 (124) or a fire department access road complying with COMM 57.02(3). This is required in order to provide fire department access to all portions of the building.

A street must comply with COMM 51.01 (124) and must extend at least 50 percent of the length of the building side served. The open area is not required to be paved, however, it must extend the entire length of the building side served.

Although the department will count fire-division walls as streets for the determination of allowable area (see discussion under COMM 54.01), this allowance does not extend to area division walls with less than a 4-hour rating. Therefore, if a large building having four sides facing streets or open areas is divided into sections by area division walls with less than a 4-hour rating, the

individual sections will have less than four streets or open areas. For example, if a one story, Type 8 constructed building with a floor area of 30,000 square feet is proposed, and that building faces streets or open spaces on all four sides, 2-hour area division walls will be required as the building exceeds the allowable area limit of 12,000 square feet. The building must be divided into at least three sections. Because the 2-hour area division walls do not count as streets or open sides after division, the end sections will have three sides facing streets or open sides and be limited to 10,500 square feet and the center section will have only two sides facing streets or open areas and is therefore limited to 9,000 square feet. The allowable areas of any building section are based upon the number of sides that section has facing streets or open areas, not the number of sides the entire building has.



These tables reference street as open space. A fire department access road that is not 30 feet wide and does not satisfy COMM 51.02 (124) street definition may not be counted as a street. The fire department access road may be considered part of an open space.

Question: *What, if anything, may be located in the open space specified in Tables 57.02-1, 2, and 3?*

Analysis: *These tables base the allowable area of a building on the number of building sides facing open spaces 30 feet, or more, wide.*

The code contains no requirements for the open space to be paved, to be provided with access to a street, nor are there any construction requirements for the space relating to grade or topography. Therefore, it is assumed that the space is being provided solely for the purpose of fire exposure to other buildings and structures, not for fire fighting purposes. Therefore, the space between the building and the property line or other building can be occupied by anything other than another structure. Steep grades, cliffs, lakes, rivers, and other features which are not structures are permitted.

Answer: *The open space provided to meet the requirements of Tables 57.02-1, 2 and 3 may be occupied by any natural feature such as steep grades, cliffs, lakes, streams and vegetation. Structures such as buildings are not permitted. Note that if exits or required rescue platforms face these open spaces, exit courts as per COMM 52.05 shall be provided.*

Note: *A 2-hour rated fire wall may not be considered as an open space when using Tables 57.02-1, 57.02-2, and 57.02-3.*

COMM 57.03 NUMBER AND LOCATION OF EXITS.

(1) NUMBER OF EXITS.

(a) Except as provided in par. (b), all living units shall have exits or exit accesses in accordance with one of the following:

1. The unit shall have at least one exit access door into a common area of the building arranged such that there are 2 directions of travel from the unit's exit access door leading to separate exits;

2. The unit shall be provided with 2 separate exits contained within the unit;

3. The unit shall be provided with 2 exit access doors into separate common areas, with each common area provided with at least one exit; or

4. The unit shall be provided with an exit access door into a common area with at least one exit, in addition to an exit contained within the unit.

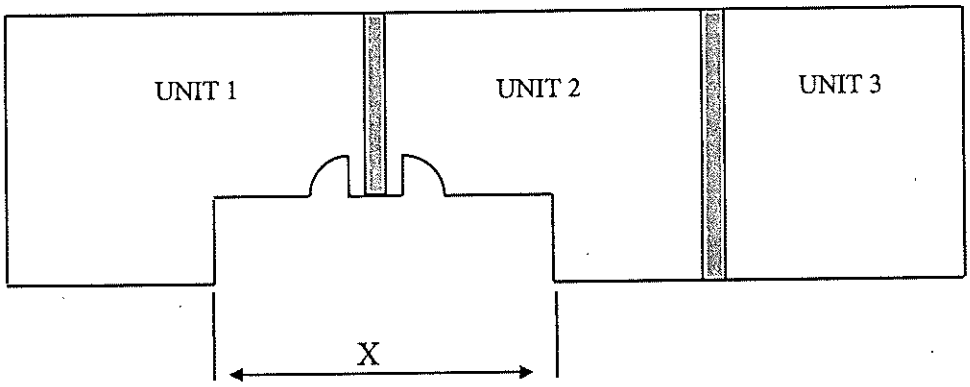
Living units are required to have at least one exit or exit access door with two directions of travel to an exit from that door ***or*** *two exits from the unit each of which provides only one direction of travel to exit the building. Because only one exit is typically required from a living unit, two or more exits* ***are not*** *required from floor levels located* ***within*** *a unit. A stairway from an upper level to a grade level landing will be considered as one direction of exiting from the unit unless that unit also has a habitable room at the grade level.*

(b) Units with habitable rooms on a floor of exit discharge may be provided with at least one exit, directly from the unit to the exterior, with the unit exit door sill at or within 6 feet of grade at the exit door.

Question: *Are two directions of travel required from an exterior door serving a single living unit with habitable rooms on a floor at exit discharge?*

Analysis: *COMM 57.03(1)(a) exiting requires two directions of travel; however, (b) (living units with exterior exits from the floor with habitable rooms on the floor of exit discharge) is an exception to (a). The code requires exiting to a street, alley, or open court. Once the occupants have exited into a court, they are considered in a safe place. Then only the court exit requirements apply.*

Answer: *Exterior doors from individual living units with habitable rooms on the floor of exit discharge may have only one direction of travel if allowed by court exiting requirements. Thus, if fire division criteria does not require additional separation, the following diagram is acceptable.*



X is court width required by COMM 52.05

(c) A minimum of 2 exits or exit access doors shall be provided from any living unit which accommodates more than 8 people.

The intent of the code is to assure that never more than eight persons could be trapped in a habitable room behind a single way out. It is not intended to permit over eight persons in a single sleeping room unless that sleeping room has two separate and remote ways out.

(2) EXIT DISTRIBUTION. The number and location of exits shall be such that in case any exit or passageway is blocked at any point, some other exit will still be accessible through public passageways from every living unit.

See COMM 54.02 (5) Commentary.

(3) DISTANCE TO EXIT.

(a) 1. Exits shall be distributed so that the entrance to each living unit will be not more than 100 feet distant from an exit, measuring along public passageways.

Note: Also see s. COMM 57.08 (2).

2. Where automatic fire sprinkler system protection as specified in s. COMM 57.016 is provided an increase in exit distance to 150 feet will be permitted.

*This provision for an increase in exit distance is **not** applicable if the building is sprinklered in accordance with COMM 57.02 (2)(a) 2.*

(b) The exit distances required by this section shall be measured to exits to grade, to doors leading to stairway enclosures as specified in ss. COMM 51.165, 51.17 and 51.18, or to horizontal exits as specified in s. COMM 51.19.

Although fire escapes in accordance with COMM 51.20 and rescue platforms in accordance with COMM 57.05 (2) are acceptable exits, exit distance can only be measured to exits to grade, doors to enclosed stairways and horizontal exits. Do not measure exit distance to fire escapes or rescue platforms.

***Question:** Should a shortened exit distance and any other restrictions apply to open exterior stairs serving as a required exit from an apartment building?*

Answer: *Yes. Provided the shortened exit distance is met, an outside stair may serve as a required exit for COMM 57 occupancies up to two stories in height. Further, the restriction cited in COMM 57.08(2)(a) limiting open exit stairs to buildings having four or less individual living units per floor DOES NOT apply in this instance.*

(4) EXITS FOR NONRESIDENTIAL PORTIONS OF BUILDINGS. Exits serving portions of buildings without sleeping rooms or living units (i.e., basements of apartment buildings, hotel lobbies, and similar areas) shall be provided in accordance with the appropriate occupancy chapter, chs. COMM 54 to 62, which may govern.

(5) DIRECTIONS FOR ESCAPE. An exiting diagram shall be conspicuously posted in every habitable room to be used by transients, including but not limited to those habitable rooms of hotels, motels, rooming houses and dormitories. The exit diagram shall depict the location of the room with respect to other rooms and at least 2 exits.

COMM 57.04 CAPACITY OF BUILDINGS AND EXITS.

(1) BUILDINGS.

(a) *Sleeping areas.* The capacity of the habitable rooms of the living units of the building, other than a community-based residential facility, shall be established as follows:

1. 400 cubic feet for each occupant over 12 years of age; and
2. 200 cubic feet for each occupant 12 years of age or under.

Question: *Often dwelling units have extended family members living as a family unit thus grandparents, parents, aunts and uncles, cousins and children are included in a single unit. How should capacity figures be evaluated to address extended family living?*

Answer: *COMM 51.01 (67a) habitable rooms are all bedrooms plus one other, such as living room, den rec, room. Thus all rooms utilized for sleeping purposes are habitable and require openable windows in accordance with COMM 57.13.*

Capacity will be determined as follows:

1. For plan review purposes, the capacity will be determined by considering only the capacity of the bedrooms considering a minimum of 2 people per bedroom in apartments and condominiums and 4 people per bedroom in motels and hotels.

2. If inspection reveals that other rooms are actually used as bedrooms, the capacity determined by the building inspector or fire chief will be the actual number of people in the unit but in no case shall the number of occupants exceed 1 person per 200/400 cubic feet as per COMM 57.04.

Code requirements such as fire alarms, openable windows, smoke detectors will be required based on the capacity of rooms designated on the plans as bedrooms plus the actual number of occupants utilizing other areas for sleeping purposes.

(b) *Minimum size.* The size of habitable rooms shall provide the minimum volumes specified in par. (a).

(c) *Nonsleeping areas.* The capacity of the areas not within the living units of the building shall be established as specified in s. COMM 54.05 or 55.06.

(d) *Overcrowding.* The number of occupants permitted in any room or in the building shall not exceed the capacities specified in this section.

(2) COMMUNITY-BASED RESIDENTIAL FACILITIES.

(a) *Facilities serving 9 to 20 residents.* The minimum size of resident bedrooms in community-based residential facilities serving 9 to 20 residents shall be as follows:

1. Sixty square feet of habitable floor space per ambulatory resident;

2. Eighty square feet of habitable floor space per semiambulatory or nonambulatory resident in multiple bed sleeping rooms; and

3. One hundred square feet of habitable floor space per semiambulatory or nonambulatory resident in single bed sleeping room.

Submitters of plans for community-based residential facilities (CBRF) must submit information with the plans relative to the licensed capacity of the CBRF.

DHFS requirements for bedrooms are found in Table 83.41 below. Contact the licensing agency for stricter requirements.

Table 83.41
MINIMUM AREA PER RESIDENT IN A BEDROOM, IN SQUARE FEET

Class of Licensure	Existing Building		New Construction	
	Single Occupancy	Multiple Occupancy	Single Occupancy	Multiple Occupancy
AA and CA (Ambulatory)	80	60	100	80
AS and CS (Semiambulatory)	100	80	100	80
ANA and CNA (Nonambulatory)	100	80	100	80

(b) *Facilities serving more than 20 residents.* The minimum size of resident bedrooms in community-based residential facilities serving more than 20 residents shall be as follows:

1. Eighty square feet of habitable floor space per ambulatory resident;

2. Eighty square feet of habitable floor space per semiambulatory and nonambulatory resident in multiple bed sleeping rooms; and

3. One hundred square feet of habitable floor space per semiambulatory and nonambulatory resident in single bed sleeping rooms.

(c) *Nonsleeping rooms.* In addition to the floor areas required under pars. (a) and (b), a community-based residential facility shall provide habitable floor space, other than sleeping rooms of not less than:

1. Sixty square feet in area for each ambulatory resident;

2. Ninety square feet in area for each semiambulatory resident; and

3. Ninety square feet in area for each nonambulatory resident.

(3) EXITS. The total required exit width from each level of the building shall be as specified in ss. COMM 51.15 (6) and 51.16 (3).

COMM 57.05 TYPE OF EXITS.

(1) GENERAL. Except as provided in sub. (2), at least one-half of the required exits, accessible from each living unit, shall be exits to grade or stairways as specified in ss. COMM 51.15 and 51.16. The remaining exits shall be either stairways, interior enclosed stairways, exits to grade or horizontal exits. Fire escapes placed against blank walls may be used as exits from floors which are not more than 40 feet above grade.

(2) EXCEPTIONS.

(a) Every building which accommodates more than one family, or 8 persons, above the second story shall have at least 2 stairways.

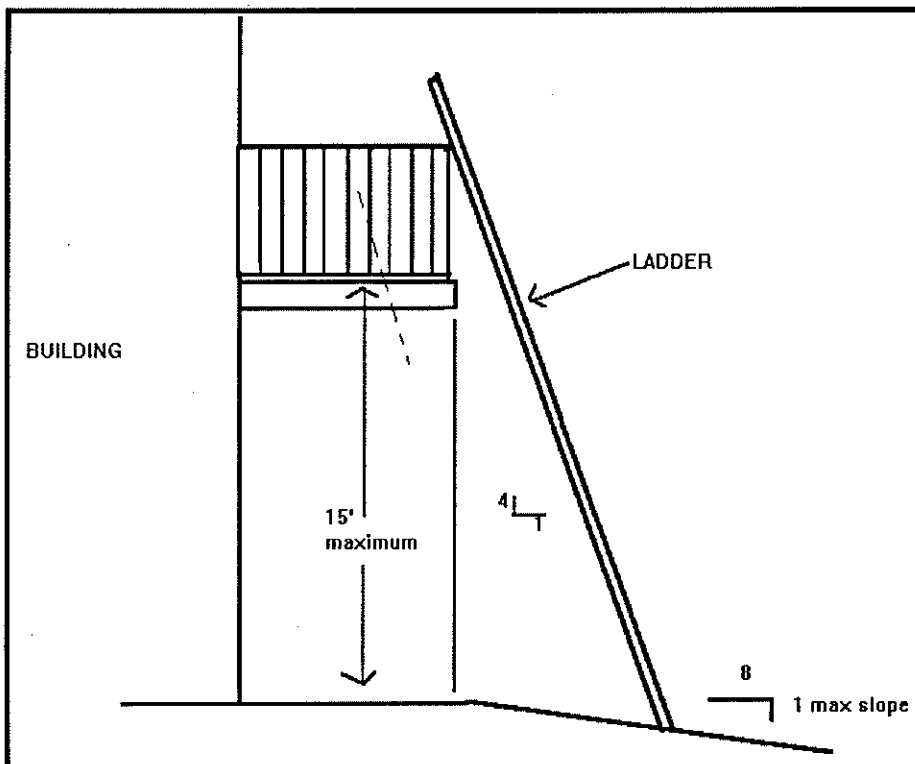
(b) A rescue platform of combustible construction may be used as a required second exit for buildings of type 5 through type 8 construction, provided the following conditions are satisfied:

1. The exit serves a single living unit;
2. The exit platform is located not more than 15 feet above the adjacent exit discharge grade;
3. The platform area is at least 14 square feet, with a minimum dimension of 3 feet;
4. The platform is designed for 80 pounds per square foot live load plus dead load;
5. Railings are provided as specified in s. COMM 51.162;
6. Platforms having solid floors are provided with a roof equal in area to that of the platform;
7. All wood used in the construction of the rescue platform shall be pressure treated wood satisfying the requirements of the applicable standards specified in s. COMM 53.63 (6) unless the wood is inherently resistant to decay; and
8. The building is not a residential care facility or group foster home.

The intent of this section is to provide a means of exiting similar to that provided by a fire escape while not requiring fire escape construction when used under the limitations imposed by this section. A fire escape is a means of exiting located on the exterior of the enclosing walls of the building and is open to the air as a means of eliminating smoke generation concerns. Because the combustible rescue platform allowed by this section of the code is intended to function as a fire escape, it must also be located on the outside of the enclosing walls of the building and must be open to the atmosphere with no enclosing walls.

Question: *The exit rescue platform must be located not more than 15 feet above the adjacent exit discharge grade. Must all points of a deck or balcony used as a rescue platform be within 15 feet of grade? How far from the edge of the rescue platform must a safe grade extend?*

(THE FOLLOWING DIAGRAM IS COMMENTARY)



Answer: *At least 3 contiguous feet of the perimeter of a rescue platform shall be within 15 feet of a grade which slopes not more than 1:8 extending from the outside edge of the platform to a point at least 4 1/2 feet from and perpendicular to the edge of the platform served.*

COMM 57.06 DOORS.

(1) EXIT DOORS. Exit doors shall be as specified in s. COMM 51.15, except:

(a) Sliding glazed patio-type doors may serve as the second exit from individual living units, provided there is a means to prevent accumulation of snow and ice in the door track or freezing of the door; and

As the code-complying unit exit must be a swing door, the ***level of exit discharge will be the level served by the swinging door.*** *Consider plans for townhouse or rowhouse type units where the units have three floor levels and the building is on a sloping site. A swing-type exit door is provided at the lowest level to grade and sliding patio doors at the middle level to grade. Since the patio doors cannot be considered the primary required exit, the point of exit discharge is at the lower level swing door. Therefore, the building is classified as three stories rather than two.*

(b) A door which is used by not more than 25 persons is not required to swing in the direction of egress.

(2) OPENINGS INTO CORRIDORS. All doors from living units opening into public exit access corridors shall be protected by at least 20-minute labeled fire-door assemblies. Such doors shall be self-closing.

Question: *Are closers required on the living unit exit access doors leading to the corridor?*

Answer: *Yes. These doors are required to be 20-minute fire door assemblies and a fire door assemblies. A fire door assembly incudes the door, frame, and hardware. Required hardware on a*

fire-door assembly includes a door closer. The unit exit access doors leading to the corridor ***must be provided with a self-closing device.***

(3) ACCESS DOORS. Exit access doors from individual living units shall be at least 3 feet 0 inches in width.

COMM 57.07 STEPS, STAIRS AND SHAFTS.

(1) EXTERIOR STAIRS. Exterior stairs shall be as specified in s. COMM 51.16, except that less than 3 steps may be provided between exterior platforms and grade serving only apartments, row houses and town houses, and the platforms or treads between such risers do not exceed 5 feet 0 inches in length in the direction of travel.

Exterior stairs may be used as required exits only from the first or second story. Exiting from levels above the second story must be via interior, enclosed stairways. When using an exterior stair as an exit, exit distance is measured from the point one reaches the ground.

(2) INTERIOR STAIRS.

(a) Interior stairs used by not more than 25 persons shall be not less than 3 feet wide.

(b) Common use interior stairs and steps not provided along an accessible route as specified in s. COMM 57.82 shall comply with s. COMM 51.16 (4), except the stairs and steps shall have a rise not more than 7-3/4 inches and a tread not less than 9-1/2 inches, measured from tread to tread and from riser to riser.

Note that COMM 57.82 only applies to apartments, condominiums and rowhouse buildings. Hotels, motels and other transient housing would require minimum 11" treads and maximum 7" risers.

Note: See s. COMM 57.77 (5) for definitions of "common use."

(3) CHANGES OF ELEVATION WITHIN INDIVIDUAL LIVING UNITS.

(a) Changes of elevation within the living unit shall be overcome by means of steps, stairs or ramps and shall be as specified in s. COMM 21.04, except a spiral stairway as specified in s. COMM 51.16 (7) may serve as the only exit from floor levels within an individual living unit, if the floor level served is no larger than 400 square feet in net area.

COMM 21.04 Stairs and elevated areas:

Every interior and exterior stairs, including tub access steps but excluding nonrequired basement stairs which lead directly to the building exterior and stairs leading to attics or crawl spaces, shall conform to the requirements of this section.

(1) STAIR DETAILS. (a) Width. Stairs shall measure at least 36 inches in width. Handrails and associated trim may project no more than 4 1/2 inches into the required width at each side of the stairs.

(b) Headroom. Stairs shall be provided with a minimum headroom clearance of 76 inches. The clearance shall be measured vertically from a line parallel to the nosing of the treads to the ceiling or soffit directly above that line.

(c) Treads and risers. 1. Except as provided in pars,(d) and (e) for spiral stairs and winders, risers may not exceed 8 inches in height measured vertically from tread to tread. Treads shall be at least 9 inches wide measured horizontally from nosing to nosing.

2. Within individual stairways, tread widths and riser heights may vary in uniformity by a maximum of 3/16 inches. Variations in uniformity may not cause either dimension in subd. 1. to be exceeded.

(d) Winders. Winder steps may be used provided the length of the tread is at least 36 inches and the width of the tread is at least 7 inches measured at a point 12 inches from the narrow end. The riser height shall be uniform and may not exceed 9-1/2 inches

(e) Spiral stairs. Spiral stairs may be used as exit stairs. The tread shall measure at least 26 inches from the outer edge of the supporting column to the inner edge of the handrail and at least 7 inches in width from nosing to nosing at a point 12 inches from the narrow end of the tread. The riser height shall be uniform and may not exceed 9 1/2 inches.

(2) HANDRAILS AND GUARDRAILS. (a) General. Stairs with more than 3 risers shall be provided with at least one handrail for the full length of the stairs. Handrails or guardrails shall be provided on all open sides of stairs consisting of more than 3 risers and on all open sides of areas that are elevated more than 24 inches above the floor or exterior grade. Handrails and guardrails shall be constructed to prevent the through passage of a sphere with a diameter of 6 inches or larger. Handrails and guardrails shall be designed and constructed to withstand a 200 pound load applied in any direction. Exterior handrails and guardrails shall be constructed of metal, decay resistant or pressure treated wood, or shall be protected from the weather.

(b) Handrails. 1. Height. Handrails shall be located at least 30 inches, but no more than 38 inches above the nosing of the treads. Measurements shall be taken from the hard structural surface beneath any finish material to the top of the rail. Variations in uniformity are allowed only when a rail contacts a wall or newel post or where a turnout or volute is provided at the bottom steps.

2. Clearance. The clearance between a handrail and the wall surface shall be at least 1 1/2 inches.

3. Winders. Handrails on winder steps shall be placed on the side where the treads are wider.

4. Projection. Handrails and associated trim may project into the required width of stairs and landings a maximum of 4 1/2 inches on each side.

5. Size and configuration. Handrails shall be symmetrical about the vertical centerline to allow for equal wraparound of the thumb and fingers.

a. Handrails with a round or truncated round cross sectional gripping surface shall have a maximum whole diameter of 2 inches.

b. Handrails with a rectangular cross sectional gripping surface shall have a maximum perimeter of 6 1/4 inches with a maximum cross sectional dimension of 2 7/8 inches.

c. Handrails with other cross sections shall have a maximum cross sectional dimension of the gripping surface of 2 7/8 inches with a maximum linear gripping surface measurement of 6 1/4 inches and a minimum linear gripping surface of 4 inches.

Note: See appendix for further information on handrail measurement.

6. Continuity. Handrails shall be continuous for the entire length of the stairs except in any one of the following cases:

a. A handrail may be discontinuous at an intermediate landing.

b. A handrail may have newel posts.

c. A handrail may terminate at an intermediate wall provided the lower end of the upper rail is returned to the wall or provided with a flared end, the horizontal offset between the two rails is no more than 12 inches measured from the center of the rails, and both the upper and lower rails can be reached from the same tread without taking a step.

(c) Guardrails. 1. Application. All openings between floors, and open sides of landings, platforms, balconies or porches that are more than 24 inches above grade or a floor shall be protected with guardrails.

2. Height. Guardrails shall be located at least 36 inches above the floor. Measurement shall be taken from the hard structural surface beneath any finished material to the top of the rail.

(3) LANDINGS. (a) Intermediate landings. A level intermediate landing shall be provided for any stairs with a height of 12 feet or more. Intermediate landings shall be at least as wide as the stairs and shall measure at least 3 feet in the direction of travel. For curved or semicircular landings, the radius of the landing shall be at least equal to the width of the stairs.

(b) Landings at the top and base of stairs. A level landing shall be provided at the top and base of every stairs. The landing shall be at least as wide as the stairs and shall measure at least 3 feet in the direction of travel.

(c) Doors at landings. Except as provided in subds. 1. to 4., level landings shall be provided on each side of any door located at the top or base of a stairs, regardless of the direction of swing. In the following exceptions, stairways to attached garages or porches are considered interior stairs:

1. A landing is not required between the door and the top of interior stairs if the door does not swing over the stairs.

2. A landing is not required between the door and the top of an interior stairs of 1 or 2 risers regardless of the direction of swing.

3. A landing is not required between a sliding glass door and the top of an exterior stairway of 3 or fewer risers.

4. The exterior landing, platform or sidewalk at an exterior doorway shall be located a maximum of 8 inches below the interior floor elevation. The landing, platform or sidewalk shall have a length at least equal to the width of the door.

2. Open railings. Open guardrails or handrails shall be provided with intermediate rails or an ornamental pattern to prevent the passage of a sphere with a diameter larger than 6 inches.

3. Clearance. The clearance between the handrail and the wall surface shall be at least 1 1/2 inches.

4. Loading. Handrails and guardrails shall be designed and constructed to withstand a 200-pound load applied in any direction.

5. Exterior rails. Exterior handrails and guardrails shall be constructed of metal, decay resistant or pressure treated wood or shall be protected from the weather.

(3) Stair Details. Stairs shall meet the following requirements:

(a) Minimum width. Every stairs shall measure at least 3 feet in width.

(b) Headroom. Every stairs shall be provided with a minimum headroom clearance of 6 feet 4 inches. The minimum clearance shall be measured vertically form a line parallel to the nosing of the treads to the ceiling or soffit directly above that line.

Note: 21.04 (2) allows a minimum headroom clearance of 6'4". We will accept headroom clearances of 6'4" for stairs within living units. The exception indicated in COMM 51.164 (1)(a) applies to public stairways in apartment buildings, rowhouses, and townhouses where the headroom clearance by be reduced to 6'8" from the general stairway headroom clearance requirement of 7'0".

(c) Treads and Risers. Risers shall not exceed 8 inches in height, measured vertically from tread to tread. Treads shall be at least 9 inches wide, measured horizontally from nosing to nosing. There shall be no variation in uniformity exceeding 3/16 inch in the width of tread or in the height of risers. No flight of stairs shall exceed 12 feet in height unless landings are provided.

(d) Winders. Winder steps may be used in stairs where the length of the tread is at least 3 feet and the winder tread measures at least 7 inches in width from nosing to nosing at a point one foot from the narrow end of the tread.

(e) Spiral stairs. Spiral stairs may be used as an exit stairs. The tread shall measure at least 26 inches from the outer edge of the supporting column to the inner edge of the handrail and at least 7 inches in width from nosing to nosing at a point one foot from the narrow end of the tread.

***Question:** COMM 51.162 (4) requires 42 inch guardrail height, however, (3)(a) permits 36 inch rail **within** living units. What rail height is required for exterior balconies, porches and rescue platforms which are outside of the exterior walls of the building?*

***Analysis:** Railings guarding exterior balconies, porches and rescue platforms which are a part of only one unit, and which are accessible only from that one unit can be considered as being within the unit itself. Because of this, railing heights of 36 inches are acceptable.*

***Answer:** Thirty six inch high guard rails are permitted on exterior balconies, porches and rescue platforms which serve only one unit and which are accessible only from that unit. A 36-inch high guardrail between balconies of adjacent units is a sufficient unit separation for this purpose.*

If the exterior balconies, porches and rescue platforms serve more than one unit, or if they are accessible from areas of the building which are not within a unit, 42-inch railings must be provided.

(b) A spiral stairway as specified in s. COMM 51.16 (7) may serve as the only exit from floor levels within an individual living unit, if the floor level served is no larger than 400 square feet.

COMM 57.08 ENCLOSURE OF INTERIOR STAIRWAYS AND SHAFTS.

(1) APPLICATION. Except as provided in sub. (2), all stairways, including landings, ramps and shafts, shall be enclosed as specified in s. COMM 51.02 (11) with fire-resistive rated construction as specified in Table 51.03-A.

(2) EXCEPTIONS.

(a) The exit access stairway or shaft connecting the first and second floor in residential buildings 2 stories or less in height may be left open in the following applications providing the conditions specified in par. (b) are satisfied:

1. Buildings having not more than 4 individual living units per floor each of which is served by 2 or more means of egress; or

Open exit stairways are permitted from the second story of a building having more than four living units on that floor provided the building is divided by horizontal exit fire walls such that there are

not more than four living units between the fire walls and provided at least one stairway is located in each section. See COMM 54.08 commentary for application guidelines.

2. A building which is used as a rooming house, dormitory or congregate living facility and which has a maximum occupancy limit of 16 persons per floor.

(b) 1. Every exit access stairway or shaft to the basement or ground floor is cut off at the first floor or first adjacent basement or ground floor level with fire resistive construction as specified in Table 51.03-A or better; and

If an open exit access stair, connecting the basement, first and second stories is provided, the stairway may be unenclosed at the first and second stories but must be enclosed at the basement level. This is in keeping with COMM 51.02 (11) which limit floor-to-floor communication by means of open shafts to no more than two floor levels.

2. The distance to an exit, including the horizontal travel distance on the exit stair, does not exceed 50 feet in buildings not completely protected with an automatic fire sprinkler system or 75 feet in buildings completely protected as specified in s. COMM 57.016.

The increase in exit distance cannot be taken if the building is sprinklered in accordance with COMM 57.02 (2)(a) 2.

COMM 57.09 PASSAGEWAYS.

(1) WHERE REQUIRED. Where there is not direct access to outside exit doors, safe and continuous passageways, aisles or corridors leading directly to every exit shall be maintained at all times on all floors of all buildings.

(2) MINIMUM WIDTH. Every public passageway leading from an exit shall be at least as wide as the required width of the exit as specified in s. COMM 51.15 (6), but in no case shall the width be less than 3 feet.

(3) WIDTH DETERMINATION. Widths shall be measured in the clear, at their narrowest points produced by any projection, radiator, pipe or other object.

(4) MAINTENANCE. The required width shall be kept clear and unobstructed at all times.

COMM 57.10 ILLUMINATION OF EXITS AND EXIT SIGNS.

(1) ILLUMINATION.

(a) Buildings having more than 4 living units or accommodating more than 30 persons or accommodating transients shall have public passageways, stairways and exit doors illuminated from one hour after sunset to one hour before sunrise.

(b) The illumination requirements specified in par. (a) shall be provided at all intersections or passageways, at all exits and at the head, foot and landing of every stairway.

(2) EXIT LIGHTS.

Section (1)(b) above does not apply to exit lights which are required to be illuminated at all times.

(a) Except as provided in par. (b), every required exit, from each floor shall be indicated by an approved illuminated, exit sign.

(b) 1. Exits within an individual living unit need not be provided with exit signs.

2. Exits in buildings having 4 living units or less per floor need not be provided with exit signs if the building contains not more than 8 living units and the path of exit from all floor levels including the basement to the outside is readily apparent.

(c) Exit lights shall be as specified in s. COMM 51.15 (5).

COMM 57.11 HABITABLE ROOMS WITH FLOORS BELOW GRADE.

(1) GENERAL. Living units in residential buildings having habitable rooms or parts on floor levels below grade shall comply with the following:

Habitable rooms include all bedrooms and one room designed for living. In a townhouse situation, if the bedrooms are located on the second floor, a living room on the first floor and a family room below grade, the family room may not be considered a habitable room as the owner may designate the living room on the middle level as the required living room. Other than bedrooms and the single living room, no other rooms in the unit are considered habitable when applying this code section.

(a) The grade at the building does not include the grade level within the perimeter of an areaway;

(b) Every habitable room shall have at least one exterior wall adjoining an areaway or court;

(c) Every habitable room shall have at least one outside window which can be opened from the inside without the use of tools to provide a clear opening of not less than 20 inches in width, 24 inches in height, and 5.7 square feet in area, with the bottom of the opening not more than 44 inches above the floor.

(d) All living units with floors below grade shall have access to 2 exits complying with s. COMM 57.05, except living units having one exit door leading directly outside and not to an areaway need not have access to a second exit.

This code section is intended to apply to living units which are entirely below grade. It is not applicable to multilevel living units where only one of the living unit floor levels is below grade.

(2) AREAWAYS. Areaways used as specified in this section shall:

(a) Be 1 1/2 times the depth to the bottom of the opening with a minimum width of 3 feet measured perpendicular to the building wall; and

Note: See s. COMM 64.07 for additional requirements.

(b) Have stairway exits complying with ss. COMM 51.16 and 52.21, when used as a required exit.

(4) MOISTURE PROTECTION. All buildings having living units below grade shall be designed and constructed to prevent undue collection of moisture in all stories below grade.

Note 1: Surface and subsoil draining systems for areaways and foundation walls are regulated under the requirements of ch. COMM 82.

Note 2: See s. COMM 50.07 (2) Note #3 for reference to flood plain requirements.

(a) All foundation walls shall be thoroughly damp proofed prior to backfilling of soil.

(b) Provisions shall be made to prevent the accumulation of moisture due to condensation of high humidity so as to prevent slippery floors and to prevent conditions susceptible to mildew or other undesirable fungi or bacteria. The inside design conditions for cooling or

dehumidification shall be on the basis of a dry bulb temperature of 75° F. and a relative humidity not greater than 50%.

COMM 57.12 SANITARY FACILITIES.

(1) TOILET ROOMS. Every building included under the scope of this chapter shall be provided with separate toilet rooms for each sex, except that a single toilet room to accommodate both sexes may be provided in individual living or sleeping units.

(2) SANITARY FIXTURES.

(a) *Residents.* The number of sanitary fixtures required for each sex shall be determined in accordance with the numbers and ratios established in Table 57.12.

Toilet rooms may be provided in individual unit, in a shared area or in a common area. Any arrangement shall afford both usability and privacy per s. Comm 52.59. A user shall be able to lock out other users into a single fixture toilet room, but not inadvertently leave them locked out upon exiting. Therefore, if a toilet room is shared between living units, it shall be accessed through a shared corridor and single toilet room door, rather than through doors accessing it directly from each unit. An exception is that if the shared toilet room is in excess of the required number of fixtures provided elsewhere in the building, then tenant doors entering directly into the shared toilet room would be acceptable.

TABLE 57.12
NUMBER OF SANITARY FIXTURES REQUIRED FOR RESIDENTIAL OCCUPANCIES[1,2]

Type of Occupancy	Type of Fixture					
	Water Closets (WC)		Urinals (U)	Drinking Facilities (DF)	Lavatories (L)	Bathtubs and Showers (S)
	Males (M)	Females (F)				
With individual unit toilet rooms	One for each living unit		0	0	One for each living unit	One for each living unit
With communal use sanitary facilities	One for each 10 (M), or fraction; one for each 10 (F), or fraction		Urinals may be substituted for up to 2/3 required (WC) for (M)	One for each 100 Persons	One for each 10 persons	One for each 20 persons

[1] For structure with additions or alterations, the required number of sanitary fixtures shall be the sum of the fixtures required for the existing portion at the time it was constructed plus the fixtures required by this table for the new addition or altererd area. At such time as the summation of the addition/alteration area is equal to or greater than 51% of the building area calculated as specified in s. COMM 50.03 (4)(d), fixtures shall be provided in conformance to this table utilizing the capacity of the entire building.

[2] Where a single toilet room designated as UNISEX is provided, it shall be considered as accommodating no more than 10 employes and 25 occupants.

(b) *Employes.* Sanitary facilities for employes who do not sleep in the building shall be provided as specified in Table 54.12, unless the employes have access to the sanitary facilities provided for the residents during all shifts.

(c) *General public.* Sanitary facilities for the general public shall be provided as specified in Table 54.12-A or Table 54.12-B, unless the general public has access to the facilities provided for the residents.

Swimming pools are also regulated by Ch. Comm 90 of the Plumbing Code. It establishes maximum capacities for swimming/exercise pools, wading pools and whirlpools and requirements for associated dressing, shower and toilet facilities. Designs shall comply with the more restrictive of the two requirements.

(3) FOOD PREPARATION. One kitchen sink, equipped with hot and cold running water, shall be provided in living units equipped for food preparation.

A shared toilet room located between bedrooms and having access to the toilet room provided by two doors, one opening directly into each separated bedroom, is not acceptable due to the lack of assured privacy or access. You must arrange for the toilet to be accessible from a single door leading into the toilet room.

COMM 57.13 WINDOWS.

Windows shall open to a street, alley, or open court.

(1) LIGHT.

(a) Every habitable room shall be provided with natural light by means of glazed openings.

When used in this section, habitable rooms include all bedrooms and one room designed for living purposes.

1. Glazed openings shall consist of windows or skylights or a combination of the two.

Question: *May doors and skylights, as well as windows, be utilized to meet the requirements for glazed area and openable area?*

Answer: *Windows, skylights and doors with glazed elements may be used to satisfy the natural light requirement if the glazing area meets the criteria of at least 8 percent. Openable windows, openable skylights and doors may be used to meet the ventilation requirement if the openable area meets the criteria of 4 percent.*

2. The area of glazed openings shall equal at least 8% of the floor area of the room served.

3. Glazed openings serving habitable rooms shall view onto the outside, except the glazed openings may obtain borrowed light from naturally lighted pool or recreational areas to serve:

a. Habitable rooms in motels and hotels, or

b. Other similar sleeping rooms accommodating transients.

(2) VENTILATION.

(a) Except as provided in par. (b), every habitable room shall be provided with natural ventilation by means of openable doors or windows. The openable amount of such doors and windows shall be at least 4% of the floor area of the room.

(b) Habitable rooms in motels and hotels and similar sleeping rooms in buildings accommodating transients shall not be required to be provided with openable doors and windows for ventilation purposes if the rooms are provided with mechanical ventilation system supplying tempered outside air and air movement as specified in s. COMM 64.05 and 64.06.

This is not applicable to apartments. Generally a hotel/motel room is assumed to have four people, thus 30 cfm outside air is required.

A minimum of 7.5 cfm of outdoor air per person is required. The department considers at least four people will occupy a typical motel or hotel room.

Please note that the allowance to obtain natural light by borrowing light from another area is permitted only in transient occupancies. Occupancies involving permanent residence, such as apartments and condominiums must obtain the required natural light and ventilation directly from the exterior.

Questions have arisen regarding hotel and motel suites where only one room in the two-room suite has exterior windows. In this case, the interior room has no windows. This will be permitted provided the window area for the unit is large enough to serve both rooms and provided the partition or construction separating the two rooms does not extend more than 50 percent of the width of the unit.

COMM 57.145 OCCUPANCY SEPARATIONS AND HAZARD ENCLOSURES.

Occupancies within the scope of this chapter shall be separated from other occupancies or uses in accordance with s. COMM 51.08. Hazards shall be enclosed in accordance with s. COMM 51.08.

COMM 57.15 FIRE PROTECTION SYSTEMS.

(1) SPRINKLER SYSTEMS. Automatic fire sprinkler systems shall be provided as outlined in ss. COMM 52.01, 52.011, 52.012 and 52.013.

(2) STANDPIPE SYSTEMS.

(a) *Fire department standpipes.* Fire department standpipes shall be provided in all buildings exceeding 60 feet in height.

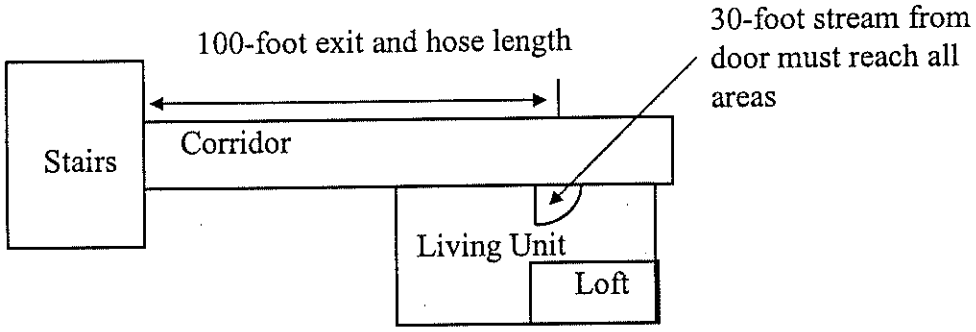
(b) *Dry standpipes.* Dry standpipes shall be provided in all buildings 3 stories or more in height which accommodate more than 20 occupants, unless an approved automatic sprinkler system as specified in s. COMM 57.016 (1) is installed. Dry standpipes that are required under this paragraph shall comply with s. COMM 51.21 (3) (b) and (k).

The dry standpipe system for three-story buildings is not required in those instances where the building is classified as three stories due to the application of s. 51.02 (14)(b) 2. In this case, the building will be classified as a three-story building but the installation of a dry standpipe will not be required.

***Question:** Does this exemption also apply if the total combined areas of tenant living spaces which are lofts and mezzanines above main floor of a building exceed one-third of the net main area enclosed within exterior walls of the building (51.02 (14)(b) 1.*

Analysis: The original intent of the code was to consider floor levels greater than one-third of the area enclosed within exterior walls as a story. Due to the complexity of keeping track of how much an area an upper level of an entire building like a shopping mall actually had, the code was changed to consider individual tenant spaces and living units.
The intent of 57.15 is to eliminate the need for firefighters to carry extra hose and equipment up the stairs. Once the area of the entire upper level exceeds one-third of the main area, there is a relatively large amount of area and combustibles which must be controlled in a fire situation; thus, the interpretation should not apply.

Answer: *No. Apply the above official code interpretation only as written utilizing 51.02 (14)(b) 2. as an exception. Provide standpipes in buildings which are determined to be three or more stories due to 51.02 (14)(b) 1. application.*



Note: COMM 57.15 (2)(b) requires the dry standpipes to comply with 51.21 (3)(b). This requires that standpipes be sufficient in number so that any part of every floor area can be reached within 30 feet by a nozzle attached to 100 feet of hose connected to the standpipe in an unsprinklered building and 150 feet of hose in a sprinklered building. See diagram for application of this section in buildings with lofts..

Question: *If all floor levels are adequately covered by as per COMM 51.21 (3)(b) by dry standpipes, do dry standpipes need to be installed in* ***every*** *enclosed stairway?*

Answer: *No, in Chapter 57 occupancies dry standpipes shall be provided in enclosed stairways in sufficient number so that any part of every floor area can be reached within 30 feet by a nozzle attached to 100 feet of hose connected to the standpipe in an unsprinklered building and 150 feet of hose in a sprinklered building. A dry standpipe shall be limited to a single riser and shall not exceed 150 feet in height.*

Note: Designers should be aware that local ordinances may be more restrictive than COMM 50-64.

Note: Dry standpipes that are required under this paragraph are required by s. COMM 51.21 (6) (b) to be located within stairway enclosures. Other stairway enclosures may be provided that do not include dry standpipes.

COMM 57.16 SMOKE DETECTION.

(1) NUMBER OF DETECTORS REQUIRED AND LOCATION.

(a) All buildings within the scope of this chapter, except CBRF shall be provided with approved smoke detectors as specified in this section.

(b) The owner shall install at least one smoke detector:

1. In the basement;

2. At the head of every open stairway;

3. At the door on each floor level leading to every enclosed stairway; and

4. Either in each sleeping area of each living unit or elsewhere in the unit within 6 feet from the doorway of each sleeping area and not within a kitchen.

The term "at least" does not infer only one detector. Smoke detectors must be installed in sufficient number and locations to satisfy the manufacturer's specifications.

(c) All smoke detectors in stairways, corridors and other public places in the building shall be directly and permanently wired to a proper unswitched circuit.

1. Such detectors shall be connected to the emergency electrical power system, when the system is required by ch. COMM 16.

2. Such detectors shall be electrically interconnected to the required manual fire alarm system. All smoke detectors, which are electrically interconnected to the manual fire alarm system, shall be a latching type, system detector intended for use with a control panel and shall utilize a supervised circuit.

If smoke detectors are voluntarily installed or installed to satisfy local ordinances, the installation shall comply with this section.

Note: See s. COMM 51.245 for additional requirements pertaining to smoke detectors.

(d) Smoke detectors shall be installed and maintained in accordance with s. 101.145 (3), Stats.

Please note that smoke detectors located within a living unit need not be interconnected with the building fire alarm system. Interconnection is only required for those detectors are located in stairways, corridors and other public places of the building.

Note: Section 101.145 (3), Stats., states: "The owner of a residential building shall install any smoke detector required under this section according to the directions and specifications of the manufacturer of the smoke detector and maintain any smoke detector which is located in a common area of that residential building. The occupant of a unit in a residential building shall maintain any smoke detector in that unit, except that if an occupant who is not an owner, or a state, county, city, village or town officer, agent or employe charged under statute or municipal ordinance with powers or duties involving inspection of real or personal property, gives written notice to the owner that a smoke detector in the unit is not functional the owner shall provide, within 5 days after receipt of that notice, any maintenance necessary to make that smoke detector functional."

(2) RETROACTIVITY.

(a) The provisions of sub. (1)(a) and (b) shall apply to all buildings constructed on or after the effective date of this section and to those buildings previously constructed.

(b) 1. If the owner of a building constructed prior to the effective date of this paragraph elects to interconnect the smoke detectors with each other, no more than 6 single station, self-contained, nonlatching smoke detectors shall be so interconnected.

2. If the owner of a building constructed prior to the effective date of this paragraph elects to interconnect the smoke detectors with the manual fire alarm system, the detectors shall be a latching type, system detector intended for use with a control panel and shall utilize a supervised circuit.

COMM 57.165 SMOKE DETECTION FOR CBRF.

Caution: Department of Health and Family Services 83.43 (1-6) has requirements which are more strict in certain instances.

(1) GENERAL. All CBRF within the scope of this chapter shall be provided with an approved smoke detection system.

(2) TYPE OF SYSTEM. The smoke detection system specified in sub. (1) shall be at least a low voltage interconnected smoke detection system designed to protect the entire facility and capable of sounding an alarm throughout the facility or at a central location upon actuation of any smoke detector.

(3) SMOKE DETECTOR LOCATION. At least 1 approved interconnected smoke detector shall be provided at the following locations:

(a) At the head of every open stairway;

(b) At the door leading to every enclosed stairway on each floor level;

(c) In every corridor, spaced not more than 30 feet apart and not further than 15 feet from any wall;

(d) In each common use room, including living rooms, dining rooms, family rooms, lounges and recreation rooms but not including kitchens; and

(e) In each sleeping room in which smoking is allowed.

(4) APPLICABILITY. The provisions of this section shall apply to all CBRF constructed on or after the effective date of this section and to those CBRF previously constructed.

Note: See s. COMM 51.245 for additional requirements pertaining to smoke detectors.

COMM 57.17 FIRE ALARMS.

(1) GENERAL.

(a) Except as provided in par. (b), every building, which can accommodate 20 or more persons, as determined by the requirements specified in s. COMM 57.04, shall be provided with a manual fire alarm system as specified in s. COMM 51.24.

*The need for a fire alarm system is based upon the **potential** to serve 20 or more persons. It is not based upon actual occupancy. As indicated by COMM 57.04, the department will consider two persons for each bedroom in apartment-type occupancies and four persons per bedroom in hotel/motel occupancies. Also see COMM 57.04 commentary on crowding and use of nonsleeping areas for sleeping.*

*A 2-hour fire-division wall may **not** be used to divide a building such that there are less than 20 persons in each section for purposes of omission of the fire alarm system. If division of the building is desired for this purpose, a building division wall must be utilized. A building division wall is a 4-hour rated wall with no openings. A building division wall may not be pierced.*

(b) Residential occupancies, including hotels and motels, not more than one story in height in which each living unit has a primary swinging exit door at grade level are exempted from the provisions of par. (a).

(2) APPLICATION. This section shall apply to all buildings in existence on the effective date of this section and to those buildings constructed thereafter.

COMM 57.18 FIRE EXTINGUISHERS.

(1) GENERAL. Portable fire extinguishers shall be provided in buildings more than one story in height. The extinguishers shall be located in the public areas of the building and comply with the requirements of Table 57.18.

Question: *If the building has no public areas, such as a rowhouse, are extinguishers required, and if required, where should they be placed?*

Answer: *Do not apply COMM 57.18 to buildings which have no public or common use areas. Fire extinguishers are not required in such buildings, even though advisable.*

TABLE 57.18

Basic Minimum Extinguisher Rating for Area specified	Maximum Travel Distance to Extinguishers (feet)	Area to be Protected per Extinguisher (square feet)
2A	75	6,000
3A	75	9,000
4A	75	11,250
6A	75	11,250

(2) LOCATION.

(a) Extinguishers shall be conspicuously located where they are readily accessible and immediately available in the event of fire.

(b) Extinguishers shall not be obstructed or obscured from view.

(3) MAINTENANCE. Portable fire extinguishers shall be maintained as specified in s. COMM 51.22.

COMM 57.19 ROWHOUSE.

(1) VERTICAL OCCUPANCY SEPARATIONS.

(a) Each living unit shall be separated from the adjacent living unit by a vertical occupancy separation of not less than one hour fire-resistive construction, extending from the foundation to the underside of the roof deck.

(b) Piercing of the vertical occupancy separation between the units by doors or windows shall be prohibited.

(c) Piercing of the vertical occupancy separation by mechanical, electrical or plumbing elements may be permitted provided the piercing is as specified in s. COMM 51.049 and it does not violate the hourly rating of the wall.

Note: Mechanical, electrical or plumbing systems may be located in the occupancy separation wall and components may penetrate one or both sides of the wall within the same stud space. See s. COMM 51.049 (3) for additional requirements pertaining to plastic components.

(2) EXITS. Each living unit shall have a separate exit within 6 feet of the exit discharge grade.

(3) ATTIC ACCESS. Each living unit shall have attic access as specified in s. COMM 51.02 (18)(a). Compliance with the provisions of s. COMM 51.02 (18)(b) is not required.

(4) EXCEPTIONS. Where each living unit has a separate heating system, compliance with ss. COMM 57.14 and 57.17 is not required.

Please note that the only advantage gained by construction of a rowhouse is the omission of a fire alarm system and omission of isolation of hazards requirements. Considering the growing use of direct vent sealed combustion chamber appliances which require no enclosure, designers should consider whether rowhouse construction is needed particularly if the occupant load is less than 20 persons.

The occupancy separation between rowhouse units must be vertical. Horizontal offsets are not permitted. The separation must extend from an outside wall to an outside wall and from a foundation to the roof. Designers should be particularly aware of these requirements when dealing with multiple pitched roofs as the fire wall must extend to the roof deck covering valleys. Also, if a relatively large, attached garage is to be divided such that each half is used by separate units, the unit separating wall must extend through the garage.

Framing must be discontinuous at the unit separation wall. The separating wall must be unpierced except for mechanical, electrical or plumbing elements.

COMM 57.20 ACCESSIBILITY REQUIREMENTS.

All places of abode covered under this subchapter shall comply with the applicable requirements of s. COMM 52.04.

The intent of this section is to apply COMM 69 requirements to all uses listed in the scope of COMM 57.001 except for those uses which satisfy the definition of covered multifamily housing in 57.77 (6). Covered multifamily housing shall comply with Subchapter II as follows.

Subchapter II — Accessibility Standards for Covered Multifamily Housing

Part 1 —Scope, Purpose and Application

COMM 57.70 SCOPE.

(1) COVERED. Except as specified in sub. (2), this subchapter applies to all covered multifamily housing including apartment buildings, rowhouses, townhouses and condominiums.

(2) NOT COVERED. Multilevel dwelling units with separate exterior entrances in buildings without elevators are exempt from the accessibility requirements specified in this subchapter.

COMM 57.70 What buildings are covered by Fair Housing?

This subchapter covers only apartment buildings, rowhouses, townhouses and condominiums with three or more dwelling units.

When new buildings are planned with an occupancy other than dwelling units on the first floor level and three or more dwelling units on the next level/levels above, the dwelling units on the first floor above grade are required to be on an accessible route and to have the accessible features regardless of the size of the building.

Buildings with elevators are required to have an accessible route to an accessible entrance regardless of site impracticality or terrain. All dwelling units in an elevatored building shall have accessible features.

Question: *Are time-share condominiums required to satisfy the barrier-free requirements under COMM 69 for hotels/motels or under COMM 57, Subchapter II for multifamily housing?*
Analysis: *Time-share condominiums, which may be occupied by a "tenant" for as little as one week a year, are not specifically addressed in the Federal Fair Housing standards upon which COMM 57.70 to 57.871 are based. Time-share condominiums also are not specifically addressed in COMM 69 or the Americans with Disabilities Act technical guidelines. Typically, a true time-share condominium is not licensed as a hotel/motel. However, when units are rented, the licensing requirements apply and the units are considered hotel/motel units. Until the federal agencies (ADA or Fair Housing) make a determination on these issues, the Division of Safety & Buildings will apply the barrier-free requirements in correlation with the Dept. of Health and Family Services licensing requirements.*

Answer: *1. If a time-share condominium is licensed for hotel/motel use by the Department of Health and Family Services, it shall comply with COMM 69 requirements.*

2. If licensing is not required, the time-share condominium shall satisfy COMM 57.70 to 57.871..

3. Buildings which are periodically utilized as owner occupied time-share units and rental units should be designed using the most restrictive requirements of COMM 69 & COMM 57.70 to 57.871.

COMM 57.71 PURPOSE.

(1) GENERAL. The purpose of this subchapter is to ensure that all buildings under the scope of this subchapter are designed and constructed to be accessible to people with disabilities.

(2) SEPARATE BUILDINGS. Dwelling units within a single structure separated by any fire-resistive rated walls within a structure do not create separate buildings, unless the walls are 4-hour fire-resistive building division walls as defined in s. COMM 50.01 (144) (a).

Note: This subchapter does not invalidate or limit the remedies, rights and procedures of federal laws or local laws that provide greater or equal protection for the rights of individuals with disabilities or individuals associated with them.

Part 2 —Departmental Actions

COMM 57.74 PLAN EXAMINATION AND DEPARTMENT ACTION.

Conformance with the accessibility requirements as specified in this subchapter shall be presented as a part of the general plan submittals as required under s. COMM 50.12.

Part 3 —Definitions

COMM 57.77 DEFINITIONS.

In this subchapter:

(1) "**Accessible**" means able to be approached, entered and used by persons with disabilities.

(2) "**Accessible route**" means a continuous unobstructed path connecting accessible elements and spaces in a building or within a site or from a site to a vehicular route, that can be negotiated by all persons with a disability. Interior accessible routes include corridors, floors, ramps, elevators and lifts. Exterior accessible routes include parking access aisles, curb ramps, walks, ramps and lifts.

(3) "**Bathroom**" means a room which contains a water closet, lavatory and bathtub or shower.

(4) "**Clear**" means unobstructed.

(5) "**Common use areas**" means rooms, spaces or elements inside or outside of a building that are made available for the use of residents of a building or their guests and which are not within an individual living unit.

(6) "**Covered multifamily housing**" means any of the following housing or dwelling units that are first ready for occupancy on or after October 1, 1993:

(a) Housing consisting of three or more dwelling units if the housing has one or more elevators;

(b) Grade-level dwelling units, in housing without elevators, consisting of three or more dwelling units; or

(7) "**Dwelling unit**" means a single unit of residence for a household of one person or a family.

(8) "**Entrance**" means any exterior access door to a building or portion of a building used by residents to enter the building. An "entrance" does not include a door to a loading dock or a door used primarily as a nonrequired service entrance, even if nondisabled residents occasionally use that door to enter.

(9) "**Finished grade**" means the ground surface of the site after all construction, leveling, grading, and development has been completed.

(10) "**Grade-level floor**" means the floor of a building closest to finished grade that contains dwelling units.

Note: See s. COMM 57.81 (1) for accessible building entrances to a grade-level floor.

COMM 57.77(10) "Grade level floor" means a floor of a building with a building entrance on an accessible route. A building may have one or more grade level floors, but must have at least one. Where the first floor level of a building containing three or more dwelling units is above grade, all units on that floor level must be served by a building entrance on an accessible route. This floor level shall be considered to be the grade level floor.

(11) "**Loft**" means an intermediate level floor between the floor and ceiling of any story located within a room or rooms of a dwelling unit.

(12) "**Multilevel dwelling unit**" means an individual dwelling unit with finished living space located on one floor level and a floor level immediately above or below it

COMM 57.77 (12) Multilevel dwelling units could be dwelling units with finished living space on both a grade level floor and a basement and/or a second floor level. "Finished living space" does not include laundry, garage, furnace room or storage areas.

(13) "**Powder room**" means a room which contains a water closet and a lavatory.

(14) "**Primary floor**" means a floor which is intended for use by the employes or patrons, or both. A floor used primarily for mechanical purposes or storage, or both, will not be considered as a primary floor.

(15) "**Public use areas**" means interior or exterior rooms or spaces of a building that are made available to the general public.

(16) "**Single-level dwelling unit**" means an individual dwelling unit with all of the finished living space located on one floor.

(17) "**Site**" means a parcel of land bounded by property lines.

(18) "**Slope**" means the relative steepness of the land between two points.

(19) "**Undisturbed site**" means the site before any construction, leveling, grading, or development associated with the current project.

(20) "**Vehicular or pedestrian arrival points**" means public or resident parking areas, public transportation stops, passenger loading zones, and public streets or sidewalks.

(21) "**Vehicular route**" means a route intended for vehicular traffic, such as a street, driveway or parking lot.

Part 4 — General Requirements

COMM 57.78 ACCESSIBILITY REQUIREMENTS, NEW CONSTRUCTION.

All covered multifamily housing constructed on or after May 1, 1994, shall comply with the accessibility requirements in ss. COMM 57.81 to 57.871.

COMM 57.79 ACCESSIBILITY REQUIREMENTS FOR ADDITIONS AND REMODELED COVERED MULTIFAMILY HOUSING.

(1) GENERAL. All existing multifamily housing being remodeled or added to under this section shall comply with the following:

(a) *More than 50% remodeled or added.* If more than 50% of the gross interior area of an existing multifamily housing building is remodeled or added to, the entire building shall be designed and constructed in accordance with the accessibility requirements specified in ss. COMM 57.81 to 57.871.

(b) *25% TO 50% remodeled or added.* If 25% to 50% of the gross interior area of an existing multifamily housing building is remodeled or added to, that portion of the building being remodeled or added to shall be designed and constructed in accordance with the accessibility standards specified in ss. COMM 57.81 to 57.871.

(c) *Less than 25% remodeled or added.* If less than 25% of the gross interior area of an existing multifamily housing building is remodeled or added to, the remodeling is not subject to the accessibility standards specified in ss. COMM 57.81 to 57.871, unless the alteration involves work on interior doors, entrances, exits, bathrooms or toilet rooms, in which case the interior doors, entrances, exits, bathroom or toilet rooms shall comply with the standards specified in ss. COMM 57.81 to 57.871.

(2) REMODELING OR ADDING IN STAGES. The percentage requirements established in this section apply to the accumulative sum of any remodeling or additions, or both, undertaken after May 1, 1994.

(3) EXISTING BUILDINGS WITH MIXED OCCUPANCIES.

(a) *Buildings with an area of 20,000 square feet or less.* If an existing building with mixed occupancies is remodeled or added to and the gross interior area of the building after remodeling or adding to is 20,000 square feet or less, access and interior circulation shall be provided to a primary floor. Interior circulation between floor levels is not required.

(b) *Buildings with an area greater than 20,000 square feet.* If an existing building with mixed occupancies is remodeled or added to and the gross interior area of the building after the remodeling or adding to is greater than 20,000 square feet, access and interior circulation shall be provided to all floor levels. The method of interior circulation provided between the floor levels shall comply with the applicable provisions in s. COMM 52.04.

COMM 57.79 (3) (b) If an existing building greater than 20,000 sq. ft., with mixed occupancies is altered or added to, access and interior circulation shall be provided only if there are three or more dwelling units in the building.

(4) CHANGE OF USE. If the use of an existing building is changed to a covered multifamily housing use and building is remodeled or added to, the building shall comply with this section.

Part 5 — Accessibility Requirements

COMM 57.81 ACCESSIBLE BUILDING ENTRANCE ON AN ACCESSIBLE ROUTE.

Covered multifamily housing shall comply with this section and Table 57.81 for the number of accessible entrances and exits, dwelling units and the accessible interior features required in the dwelling units.

COMM 57.81 How many exits are required to be accessible?

All required grade level exits shall be accessible. This does not mean that all required exits have an accessible path of travel to the parking or public transportation locations. When a required second exit from a dwelling unit on an accessible floor level of a building exits to a stairway or rescue platform, a 30-inch by 48-inch area clear of the swing of the door shall be provided. If site impracticality becomes a factor, a petition for variance is required.

COMM 57.81 (1) How many dwelling units are required to be accessible?

Single-story dwelling units with individual entrances. All single-story "grade level floor" dwelling units shall be accessible with a building entrance on an accessible route.

***Single-story dwelling units with common use entrances.** All floor levels with single-story "grade level floor" dwelling units in buildings with common use entrances shall have a building entrance on an accessible route.*

***Buildings with elevators which have single-story dwelling units.** Buildings with elevators containing single-story dwelling units shall be designed and constructed to provide at least one accessible entrance on an accessible route regardless of terrain. All dwelling units on floors served by elevators in these buildings shall be on the accessible route and have the accessible features.*

***Buildings with elevators containing multilevel dwelling units.** All multilevel dwelling units on floors served by elevators shall have an accessible entrance to a floor level containing living space. The accessible floor shall contain a powder room or bathroom which complies with COMM 57.871.*

***Multistory dwelling units in builings without elevators.** With the recent emergency rule and permanent rule change, such multi-level living units are not required to be accessible. For a unit to qualify as multi-level, it shall have two finished floor levels more than 3 feet in elevation difference.*

***Multistory buildings with single-story dwelling units and no elevator.** The first floor level requires 100% of the dwelling units to be accessible. Other stories do not require accessibility unless they have grade level entrances.*

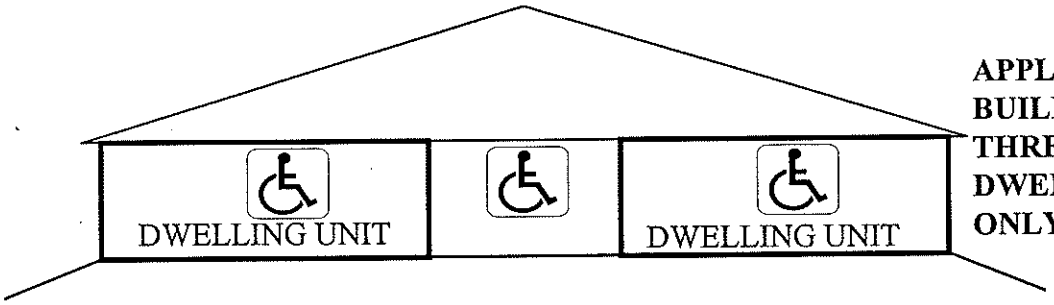
***Buildings with more than one grade level floor.** All grade level dwelling units shall be accessible. Each building on a site is required to have the grade level floor/floors on an accessible route.*

***Buildings with mixed one-story and multistory dwelling units.** In buildings where you have mixed one-story and multistory dwelling units, you look at each type of unit separately. The single-story grade level units require 100% accessibility. The multistory units do not require accessibility as explained above.*

Buildings with mixed occupancies. *In new multi-story construction, regardless of the size of the building, the lowest floor with dwelling units is the grade level floor and shall be on an accessible route. This pertains only to buildings containing three or more dwelling units.*

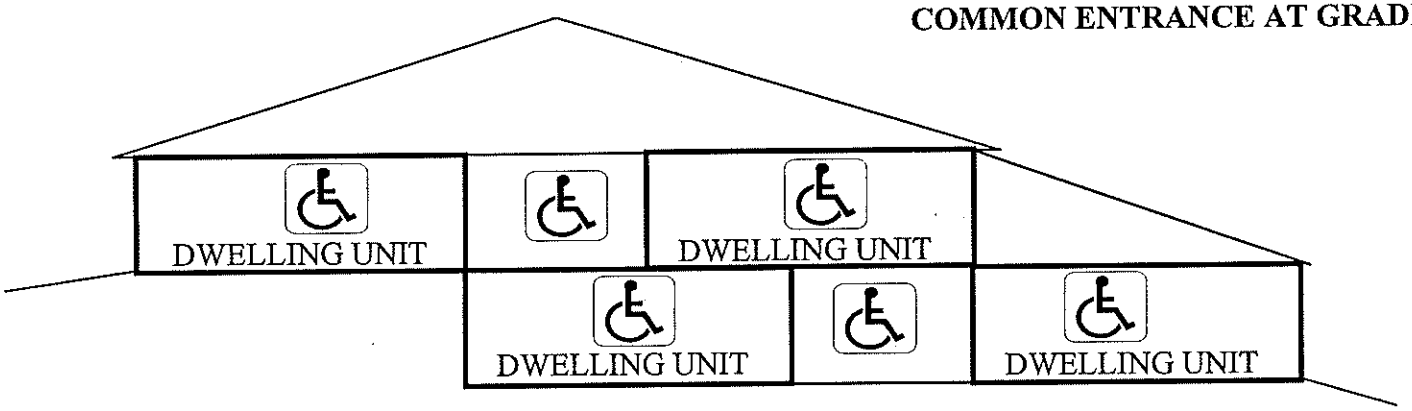
COMMON ENTRANCE AT GRADE

APPLIES TO BUILDINGS WITH THREE OR MORE DWELLING UNITS ONLY

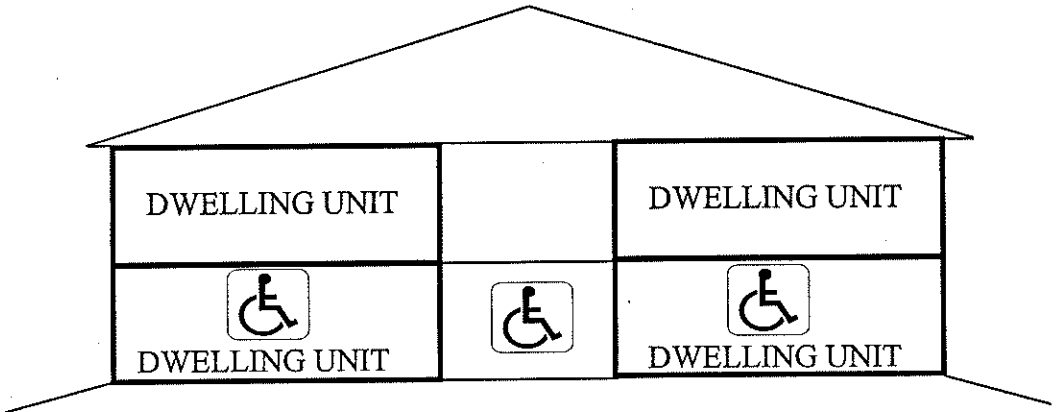


COMM 57.81 - BUILDING WITH COMMON ENTRANCE AND SINGLE LEVEL UNITS

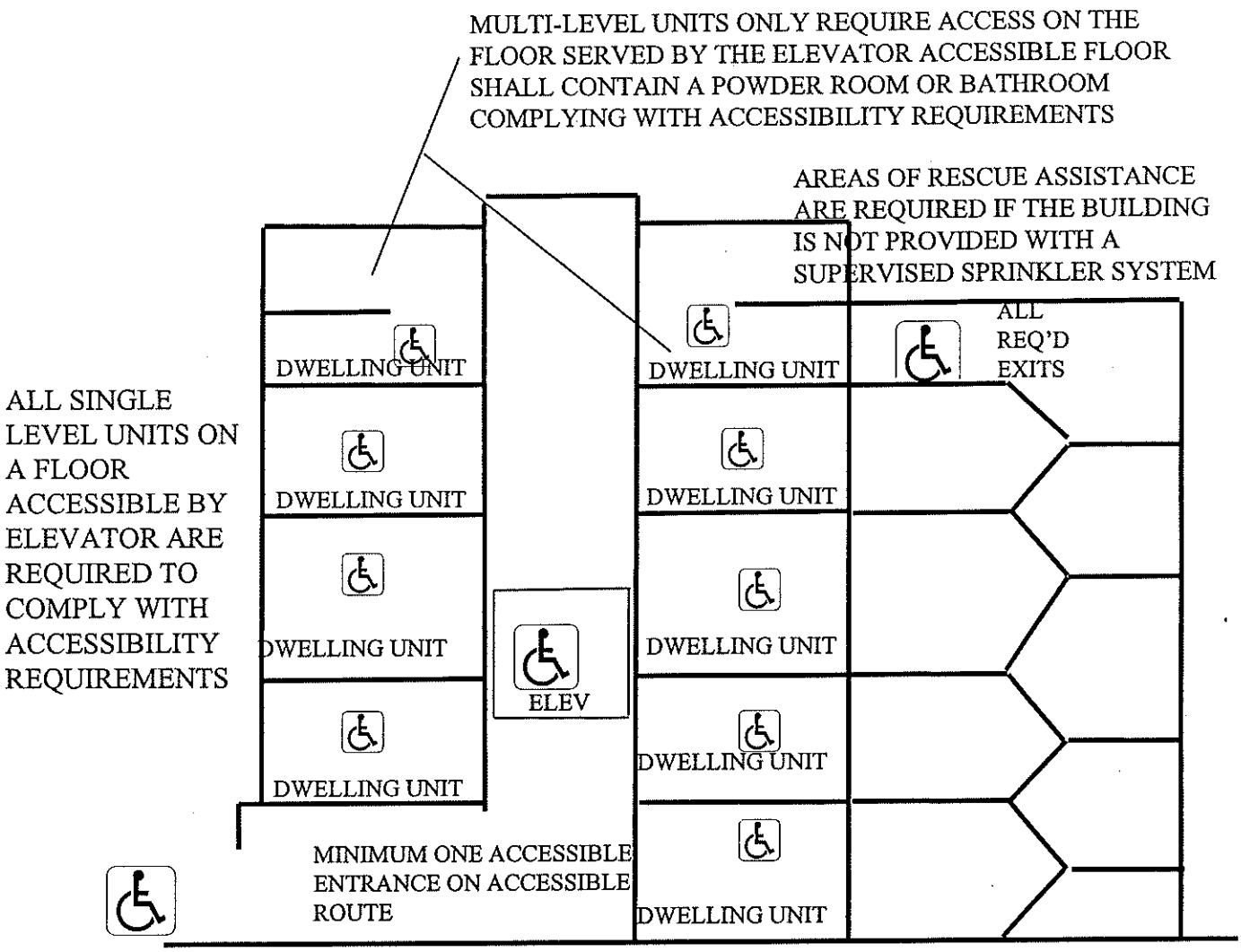
COMMON ENTRANCE AT GRADE



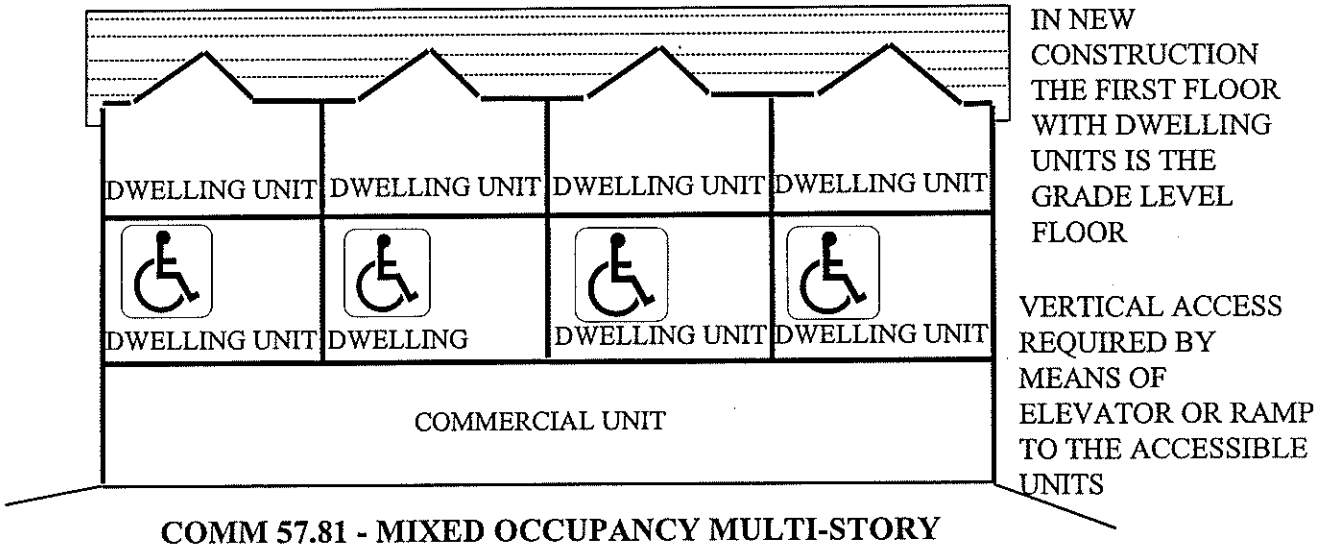
COMM 57.81 - BUILDING WITH COMMON ENTRANCE AND SINGLE LEVEL UNITS ON MORE THAN ONE FLOOR



COMM 57.81 - BUILDING WITH COMMON ENTRANCE AND SINGLE LEVEL UNITS



COMM 57.81 - BUILDING WITH ELEVATOR



COMM 57.81 - MIXED OCCUPANCY MULTI-STORY BUILDING WITH DWELLING UNITS ABOVE THE FIRST FLOOR

(1) ACCESSIBLE BUILDING ENTRANCES TO A GRADE-LEVEL FLOOR. Except for covered multifamily housing with site impracticality as specified in sub. (4), the grade-level floor of each covered multifamily housing building on a site shall be served by a building entrance on an accessible route. In addition to the designated grade-level floor with dwelling units, all other floors containing dwelling units which are located within 30 inches of finished grade shall be served by a building entrance on an accessible route.

(2) ACCESSIBLE ENTRANCE DOOR. Each accessible entrance door to a covered multifamily housing building shall be at least 36 inches in width. Minimum space requirements at the latch side of the door shall comply with the applicable portions of Table 57.82.

(3) ACCESSIBLE ROUTE. Except for covered multifamily housing with site impracticality as specified in sub. (4), each building on a site shall have at least one accessible route complying with applicable portions of Table 57.82.

(4) SITE IMPRACTICALITY DUE TO TERRAIN OR UNUSUAL CHARACTERISTICS OF THE SITE.

(a) *Petition for variance.* Except for housing in floodplains or coastal high-hazard areas as specified in par. (d), the department may grant a variance from the requirements relating to an accessible entrance or an accessible route to a covered multifamily housing without elevators, if the person designing, constructing or remodeling the housing shows that complying with the accessible entrance or an accessible route is impractical because of the terrain or unusual characteristics of the site. Site impracticality shall be determined through the petition for variance procedure specified in s. COMM 50.25.

(b) *Determining site impracticality.* To determine the site impracticality of an undisturbed site, the designer shall use the site impracticality requirements as specified in requirement number 1., (2) of the federal fair housing accessibility guidelines, as printed in the federal register, volume 56, number 44, on March 6, 1991.

TABLE 57.81
NEW CONSTRUCTION REQUIREMENTS

Types of Covered Multifamily Housing	Number of Accessible Entrances [1]	Number of Required Accessible Exits from Grade-Level Floor [2]	Number of Accessible Dwelling Units	Accessible Features of Dwelling Unit
I. Covered multifamily housing without elevators.				
A. Housing with common entrances to a grade-level floor with dwelling units.				
1. Single-level dwelling units	All entrances [3]	All required exits [4,5,6]	All dwelling units on the grade-level floor.	ss. COMM 57.82 to 57.871
2. Multilevel dwelling units	All entrances [3]	All required exits [4,5,6]	Grade-level portion of dwelling units on the grade-level floor	ss. COMM 57.82 to 57.871
B. Housing with separate exterior entrances to each dwelling unit				
1. Single-level dwelling units	All entrances [3]	All required exits [4,5,6]	All grade-level dwelling units	ss. COMM 57.82 to 57.871
II. Covered multifamily housing with elevators [8]				
A. Single-level dwelling units	All entrances [3]	All required exits [4,5,6]	All dwelling units on all floors served by an elevator shall be accessible.	ss. COMM 57.82 to 57.871 Required in all dwelling units on all floors served by an elevator.
B. Multilevel dwelling units	All entrances [3]	All required exits [4,5,6]	Grade-level portions of all multilevel dwelling units on all floors served by an elevator shall be accessible.	ss. COMM 57.82 to 57.871 Required in grade-level portion of all dwelling units on all floors served by an elevator.

57.81

Footnotes

[1] An accessible entrance may also serve as a required exit.

[2] Exits required by chs. COMM 50 to 64.

[3] Where all entrances are not accessible, site impracticality for the nonaccessible entrances shall be determined through the petition process.

[4] Where a rescue platform as specified in s. COMM 57.05 (2) or an exterior stairway is provided as a second exit from an individual dwelling unit, the rescue platform or exterior stairway shall be sized to accommodate at least one wheelchair space. The wheelchair space shall measure at least 30 inches by 48 inches and the swing of the exit door shall not infringe into the wheelchair space.

[5] A second exit from a grade-level floor with dwelling units may be to an exterior stairway, providing the exit stairway platform is sized to accommodate space for two wheelchairs. Each wheelchair space shall measure at least 30 inches by 48 inches and the swing of the exit door shall not infringe into the wheelchair spaces.

[6] Where all exits are not accessible, site impracticality for the nonaccessible exits shall be determined through the petition process.

[8] Where a building elevator is provided only as a means of creating an accessible route to dwelling units on a grade-level floor, the building is not considered an elevator building, only the grade-level dwelling units shall be accessible

57.81 (4) Site impracticality guidelines - reprint from Federal Fair Housing Accessibility Guidelines, Requirement Number 1., (2).

(2) Site impracticality. Covered multifamily dwellings with elevator shall be designed and constructed to provide at least one accessible entrance on an accessible route, regardless of terrain or unusual characteristics of the site. Covered multifamily dwellings without elevators shall be designed and constructed to provide at least one accessible entrance on an accessible route unless terrain or unusual characteristics of the site are such that the following conditions are found to exist:

(a) Site impracticality due to terrain. There are two alternative tests for determining site impracticality due to terrain: the individual building test provided in paragraph (i) or the site analysis test provided in paragraph (ii). These tests may be used as follows.

A site with a single building having a common entrance for all units may be analyzed only as described in paragraph (i).

All other sites, including a site with a single building having multiple entrances serving either individual dwelling units or clusters of dwelling units, may be analyzed using the methodology in either paragraph (i) or paragraph (ii). For these sites for which either test is applicable, regardless of which test is selected, at least 20 percent of the total ground floor units in nonelevator buildings, on any site, must comply with the guidelines.

(i) Individual building test. It is impractical to provide an accessible entrance served by an accessible route when the terrain of the site is such that:

(A) The slopes of the undisturbed site measured between the planned entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance exceed 10 percent; and

(B) The slopes of the planned finished grade measured between the entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance also exceed 10 percent.

If there are no vehicular or pedestrian arrival points within 50 feet of the planned entrance, the slope for the purposes of this paragraph (i) will be measured to the closest vehicular or pedestrian arrival point.

For purposes of these guidelines, vehicular or pedestrian arrival points include public or resident parking areas; public transportation stops; passenger loading zones; and public streets or sidewalks. To determine site impracticality, the slope would be measured at ground level from the point of the planned entrance on a straight line to (i) each vehicular or pedestrian arrival point that is within 50 feet of the planned entrance, or (ii) if there are no vehicular or pedestrian arrival points within that specified area, the vehicular or pedestrian arrival point closest to the planned entrance. In the case of sidewalks, the closest point to the entrance will be where a public sidewalk entering the site intersects with the sidewalk to the entrance. In the case of resident parking areas, the closest point to the planned entrance will be measured from the entry point to the parking area that is located closest to the planned entrance.

(ii) Site analysis test. Alternatively, for a site having multiple buildings, or a site with a single building with multiple entrances, impracticality of providing an

accessible entrance served by an accessible route can be established by the following steps:

(A) The percentage of the total buildable area of the undisturbed site with a natural grade less than 10 percent slope shall be calculated. The analysis of the existing slope (before grading) shall be done on a topographic survey with two foot (2') contour intervals with slope determination made between each successive interval. The accuracy of the slope analysis shall be certified by a professional licensed engineer, landscape architect, architect or surveyor.

(B) To determine the practicality of providing accessibility to planned multifamily dwellings based on the topography of the existing natural terrain, the minimum percentage of ground floor units to be made accessible should equal the percentage of the total buildable area (not including floodplains, wetlands, or other restricted use areas) of the undisturbed site that has an existing natural grade of less than 10 percent slope.

(C) In addition to the percentage established in paragraph (B), all ground floor units in a building, or ground floor units served by a particular entrance, shall be made accessible if the entrance to the units is on an accessible route, defined as a walkway with a slope between the planned entrance and a pedestrian or vehicular arrival point that is no greater than 8.33 percent.

(b) Site impracticality due to unusual characteristics. Unusual characteristics include sites located in a federally-designated floodplain or coastal high-hazard area and sites subject to other similar requirements of law or code that the lowest floor or the lowest structural member of the lowest floor must be raised to a specified level at or above the base flood elevation. An accessible route to a building entrance is impractical due to unusual characteristics of the site when:

(i) The unusual site characteristics result in a difference in finished grade elevation exceeding 30 inches and 10 percent measured between an entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance; or

(ii) If there are no vehicular or pedestrian arrival points within 50 feet of the planned entrance, the unusual characteristics result in a difference in finished grade elevation exceeding 30 inches and 10 percent measured between an entrance and the closest vehicular or pedestrian arrival point.

(c) *Petition conditions and waiver.* Exterior accessibility shall be provided to at least 50% of the dwelling units of covered multifamily housing at one site. The department may impose specific conditions in granting a variance to promote exterior accessibility of the covered multifamily housing to persons with disabilities. If the department finds that exterior accessibility is impractical to all dwelling units at a site, the department may grant a waiver from the exterior requirements under sub. (1).

(d) *Floodplains and coastal high-hazard areas.* A petition for variance is not required for covered multifamily housing located in a federally, state or locally designated floodplain or coastal high-hazard area. Written documentation shall be submitted to this department for approval indicating the covered multifamily housing building is located such that the lowest

floor or the lowest structural member of the lowest floor must be raised to a specified level at or above the base flood elevation.

COMM 57.82 ACCESSIBLE AND USABLE PUBLIC AND COMMON USE AREAS.

(1) GENERAL PUBLIC AND COMMON USE AREAS. All public and common use areas, such as hallways, lounges, lobbies, laundry rooms, refuse rooms, mail rooms, recreational areas and passageways among and between buildings in covered multifamily housing shall comply with Table 57.82 and the appropriate sections of the Americans with Disabilities Act Accessibility Guidelines (ADAAG), as printed in Part III of the July 26, 1991 Federal Register and the September 6, 1991 Federal Register and as corrected in the January 14, 1992 Federal Register. Table 57.82 cites the appropriate section of the ADAAG standards and describes the appropriate application of the standards, including modifications to the referenced standard.

Note: Copies of the ADAAG standards can be obtained from the New Orders, Superintendent of Documents, P.O. Box 371954, Pittsburgh, Pennsylvania 15250-7954.

***Table 57.82** Where are lever door handles required?*

Lever door handles are required on doors in common use areas and the entrance doors to the dwelling units. Main entrance doors to a dwelling unit or building are common use areas and also require the maneuvering to public side of the living units. Lever handles are also required on all doors and/or plumbing fixtures in the dwelling unit if the resident requests them. The handles shall be installed at the building owners' expense.

***Table 57.82 and COMM 57.17** Where are visual alarms required for residential buildings?*

Visual alarms are only required in common use areas of the building.. In the common use areas, the visual alarms shall comply with ADAAG 4.1.3 (14) and 4.28. Residents who choose to provide their own alarm devices may provide portable units.

Table 57.82 Rescue Assistance

***Question:** Can a NFPA 13R system be supervised and monitored in accordance with the ADAAG 4.1.3 (9) exemption from areas of rescue assistance required by section COMM 57.82, line 14, and ADAAG 4.3.11.3(9)?*

***Answer::** Yes. A NFPA 13R system possesses most of the same operational components as a NFPA 13 suppression system. It is accepted as a fully sprinklered occupancy if designed and installed in accordance with NFPA 13R and maintained in accordance with NFPA 25 (Inspection, Testing and Maintenance of Water Based Fire Protection Systems).*

***Question:** What is meant by supervised and monitored?*

***Answer:** Supervised and monitored is accepted and explained by the Federal Register, Vol. 56.144. "Supervised automatic sprinkler systems have built-in signals for monitoring of the system such as opening and closing of water control valves, the power supplies for needed pumps and water tank levels and for indicating conditions that will impair the operation of the sprinkler system. Because of these monitoring features, supervised automatic sprinkler systems have a high level of satisfactory performance and response to fire conditions and the Board does not believe that additional measures are needed in buildings and facilities with such systems."*

Another method of monitoring would be the installation of a products-of-combustion detector system and a suppression system (in this case a NFPA 13R system). Once the installation of the detection system and the sprinkler system is complete, the detection system is connected to an electronic graphic monitor which would have the signals from the detection system interlocked with

the sprinkler system. When the detection system is activated by a fire, the alarm is also activated and becomes operational. What the sprinkler head fuse cannot detect, the product of combustion detector would. It is important to point out here that supervised and monitored systems must have a battery back-up power system.

Different types of supervisory and monitored systems are: Local alarm, remote alarm, proprietary alarm and central station. For power supply supervision and wiring of detection, alarm and control systems, the National Electrical Code (NFPA Standard 70) requirements must be followed. The local alarm system produces, when activated, an alarm only for the facility it serves or on the premise of the area served, where the alarm is audible and sometimes visible, within the building or facility it protects.

The remote alarm system, when activated, automatically transmits a signal to a constantly attended location. One simple and inexpensive method of transmitting a remote signal device is over a leased and dedicated telephone line. A proprietary alarm system serves a facility or complex of buildings with its own alarm receiving location. It could activate its own local alarm system to a central, constantly attended area that is part of and owned by a complex. The signal is typically indicated on a graphic enunciator. The central station alarm signal is automatically transmitted to a control station that employs experienced personnel whose occupation is the monitoring of the panel that receives the signal.

Question 1: *(Table 57.82, 7.) When are stairways, located in the common use areas of covered multifamily dwellings, required to comply with ADAAG 4.9 (7-inch riser and 11-inch tread)?*

Answer 1: *A stairway with 7-inch risers and 11-inch treads is required only when a ramp is constructed along with a stairway leading to an accessible grade-level floor with living units or to a common or public use area of the building.*

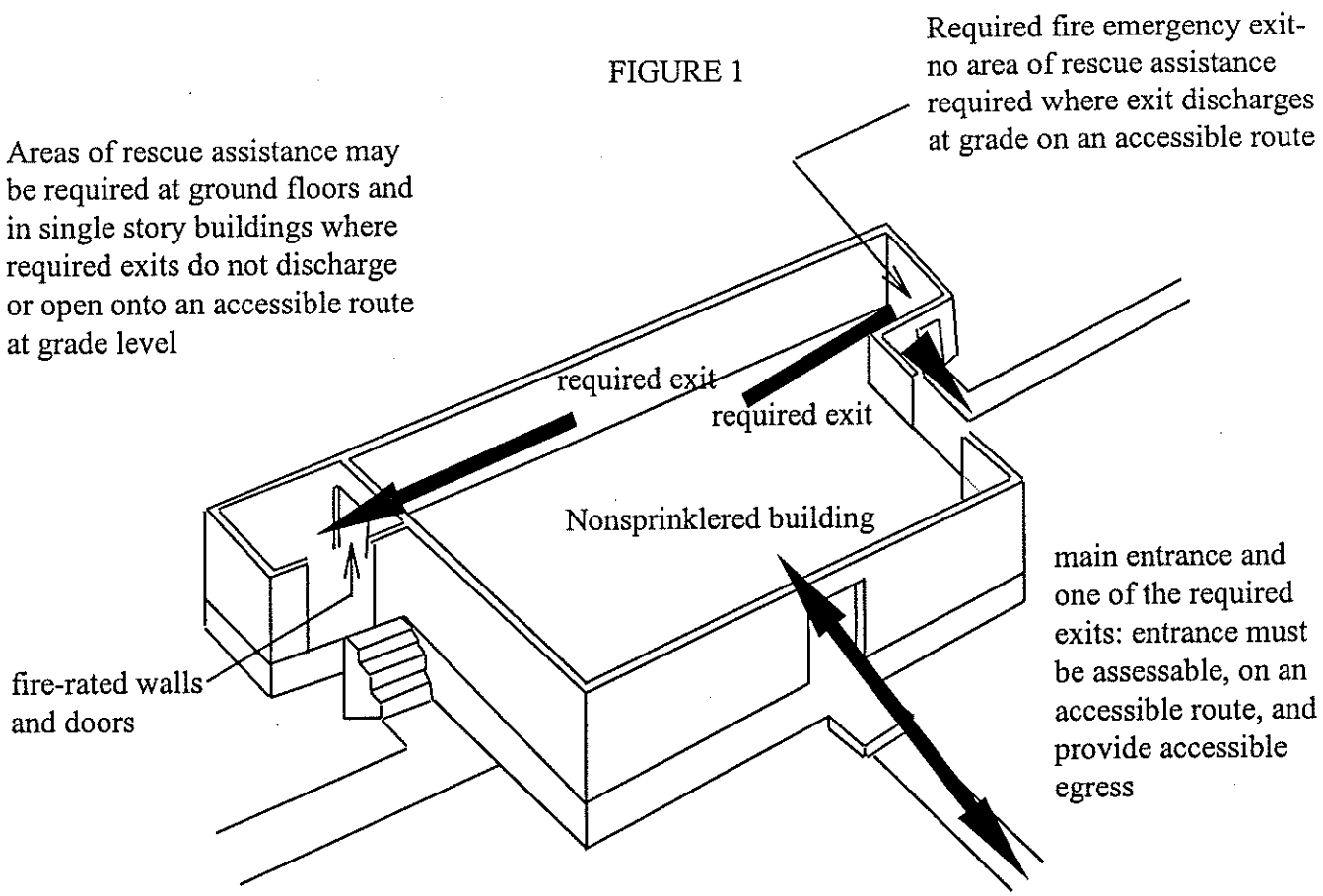
Question 2: *(Table 57.82, 14.) Where are areas of rescue assistance required in covered multifamily housing?*

Answer 2: *Case 1: Nonelevatored covered multifamily housing with either common entrances and exits from the grade-level floor, or housing with common entrances and with separate exterior exits from each dwelling unit:*

Areas of rescue assistance are required in covered multifamily housing, without monitored sprinklers, where the required exits from the accessible.grade-level floor with living units do not discharge or open onto an accessible route at grade level. (See Figure 1)

continued

FIGURE 1



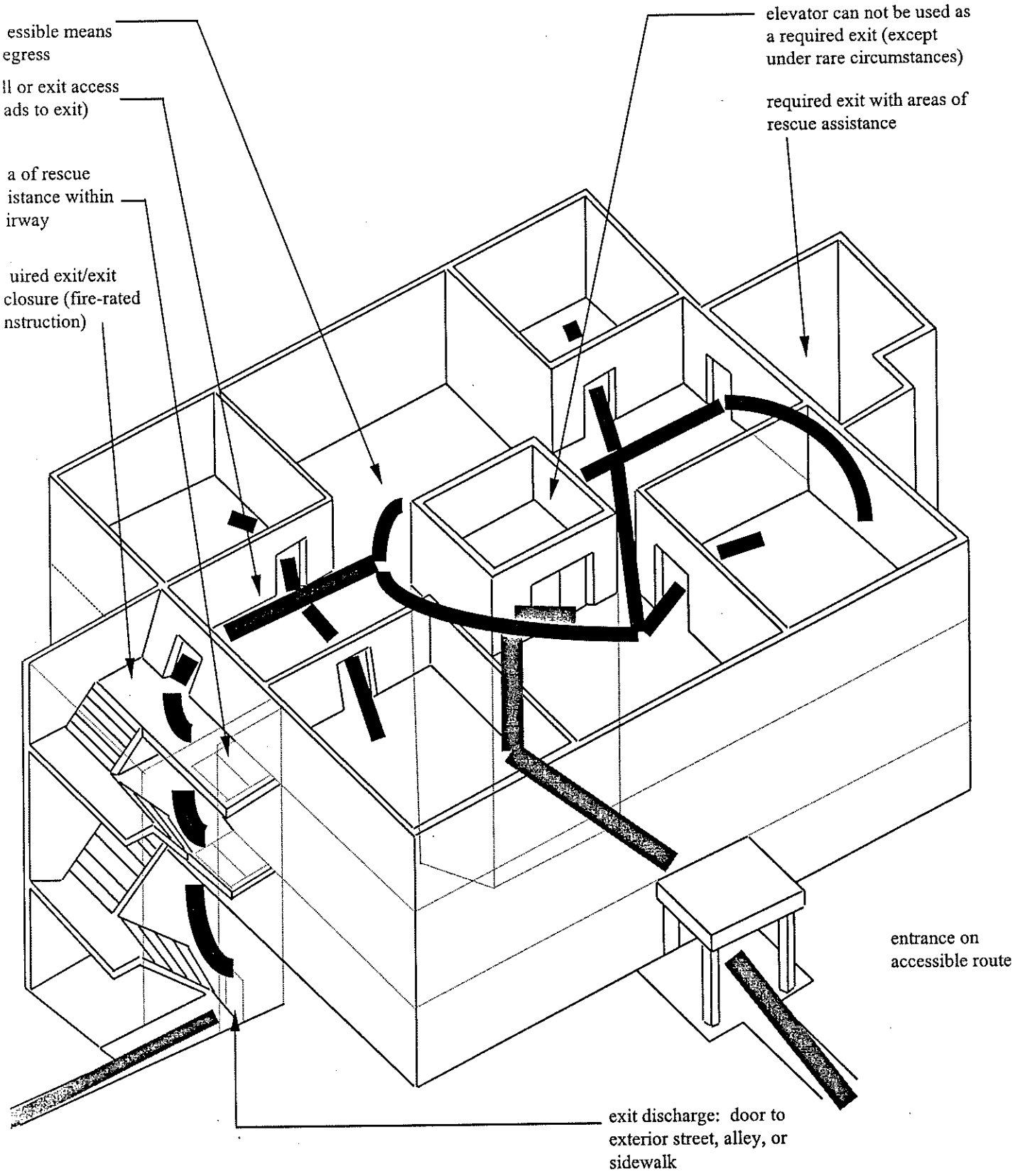
Areas of Rescue Assistance May Be Required in Some One-Story Buildings

Case 2: Covered multifamily housing with elevators: '

Areas of rescue assistance are required in all new covered multifamily housing buildings with elevators and without supervised and monitored sprinkler systems. Where required exits on,floors above and below the grade-level floor -cannot discharge onto an accessible route at grade level, then each floor above and below the grade-level floor must be provided with areas of rescue assistance at every required exit stairway. (See Figure 2)

continued

FIGURE 2
AREAS OF RESCUE ASSISTANCE



Accessible Means of Egress As Part of Accessible Route

BACKGROUND INFORMATION

In accordance with the State Fair Housing laws, the rules developed by this Department were to be consistent with the Final Fair Housing Accessibility Guidelines as well as requirements specified in the State Fair Housing law.

The Federal Fair Housing Accessibility Guidelines indicate that stairs are subject to the ANSI standard only when the stairs are located along an accessible route not served by an elevator. Accessibility between the levels served by the stairs or steps would, under such circumstances, be provided by some other means such as a ramp or lift located with stairs or steps. In nonelevatored buildings, stairs serving levels above or below the grade-level floor are not required to meet the ADAAG standard, unless the stairs are a part of an accessible route providing access to public or common use-areas.

When the State Fair Housing requirements were developed the Americans with Disabilities Accessibility Guidelines (ADAAG) were referenced, since the general accessibility rules were being changed to comply with the ADAAG. Both the ANSI and ADAAG requirements are the same and it was the intent that the public and common use areas of housing comply with these requirements.

COMM 57.77 (6) and (10). A multifamily housing building is required to provide access to at least one floor with living units and the living units are required to be designed with accessibility features specified in subchapter II of COMM 57. In elevatored buildings, every floor with living units that is served by the elevator are required to have the living units designed with accessibility features specified in subchapter II of COMM 57.

The floor levels required to have accessible living units shall be reachable by an accessible route. If there is a difference in elevation of more than 1/2 inch along the accessible route, the floor levels must be connected by an elevator ramp or other accessible means of vertical access.

COMM 57.77 (5) Common use areas are rooms, spaces or elements inside or outside of a covered multifamily housing building that are made available for the use of residents of the building or their guests and which are not within an individual living unit.

COMM 57.77 (15) Public use areas are interior and exterior rooms or spaces of a covered multifamily housing building that are made available to the general public.

(2) ACCESSIBLE PARKING SPACES. If parking spaces, such as surface parking or garage parking, are provided at covered multifamily housing, accessible parking spaces shall be provided and designed in accordance with the following:

(a) *Size.*

1. 'Tenant parking.'

   a. Except as specified in subpar. b, an accessible parking space shall be at least 96 inches wide with an adjacent marked access aisle at least 60 inches wide.

   b. A private garage serving an individual accessible dwelling unit shall have a minimum clear inside dimension of 13 feet in width.

2. 'Visitor parking.' An accessible parking space when provided for visitors shall be at least 96 inches wide with an adjacent marked access aisle at least 60 inches wide.

(b) *Number of accessible parking spaces.*

1. 'Tenant parking.' At least 2% of the total number of tenant parking spaces at each type of parking facility, such as surface parking or garage parking, shall be accessible. In no case shall there be less than one accessible parking space at each type of parking facility at each building.

2. 'Visitor parking.' If visitor parking is provided in addition to the tenant parking, at least 2% of the visitor parking spaces, with a minimum of one, shall be accessible.

(c) *Accessible route.*

1. 'General.' Except as specified in subd. 2., an exterior accessible route shall be provided from each accessible parking space to an accessible building entrance. The accessible parking spaces shall be located as close as possible to the accessible building entrance.

2. 'Exceptions.'

a. In a covered multifamily housing building with underground parking, interior circulation to a grade-level floor with dwelling units may be provided in lieu of an exterior accessible route from the underground parking to an accessible building entrance. The method of interior circulation shall be an elevator or another approved method of interior circulation as specified in s. COMM 52.04 and ch. COMM 18.

b. In a covered multifamily housing building without elevators and having underground parking, on-grade covered garage parking located on an exterior accessible route to an accessible building entrance may be used in lieu of the underground accessible parking spaces and the exterior accessible route from the underground parking facility.

3. 'Private attached garages.' If a single-level dwelling unit or an accessible multilevel dwelling unit has an attached garage which serves only that dwelling unit, an exterior or interior accessible route shall be provided from the attached garage to an accessible dwelling unit entrance.

(d) *Passenger loading zones.* If passenger loading zones are provided, the passenger loading zones shall be designed and installed to comply with ADAAG 4.6.6.

(e) *Identification.*

1. 'Tenant parking.' The accessible tenant parking spaces provided at covered multifamily housing shall be designated with a sign which clearly states that the parking space is reserved for use by tenants with disabilities. The sign specified in s. TRANS 200.07 shall not be used to identify tenant accessible parking spaces.

2. 'Visitor parking.' Accessible visitor parking spaces shall be identified with a sign complying with s. TRANS 200.07, Wis. Adm. Code. Additional signs shall be installed to direct persons from the accessible parking space to the accessible entrance.

COMM 57.82 (2) (b) *How many accessible parking spaces are required per building?*

Tenant parking. *At least 2% of each type of parking (surface, garage, underground) at each building on a site shall be accessible.*

Visitor parking. *At least 2% of visitor parking, in addition to the tenant parking, shall be accessible at each building on a site, if visitor parking is provided.*

COMM 57.82 (2) (c) and COMM 57.82 (2)(c) 3. *What type of access is required from garages?*

Accessible route for underground parking:

1. Access from underground parking may be interior circulation by elevator or ramp to the dwelling units or

2. Access may be provided by an accessible route from the parking level to the outside and around to an accessible entrance with a ramp which is no more than 1:12 and is separated from the drive or

3. An enclosed garage may be provided at grade level with an accessible route to the accessible entrance.

Required exits from underground garages shall be accessible either at grade or by an area of rescue assistance unless the building is completely sprinklered per COMM 51.23 (9).

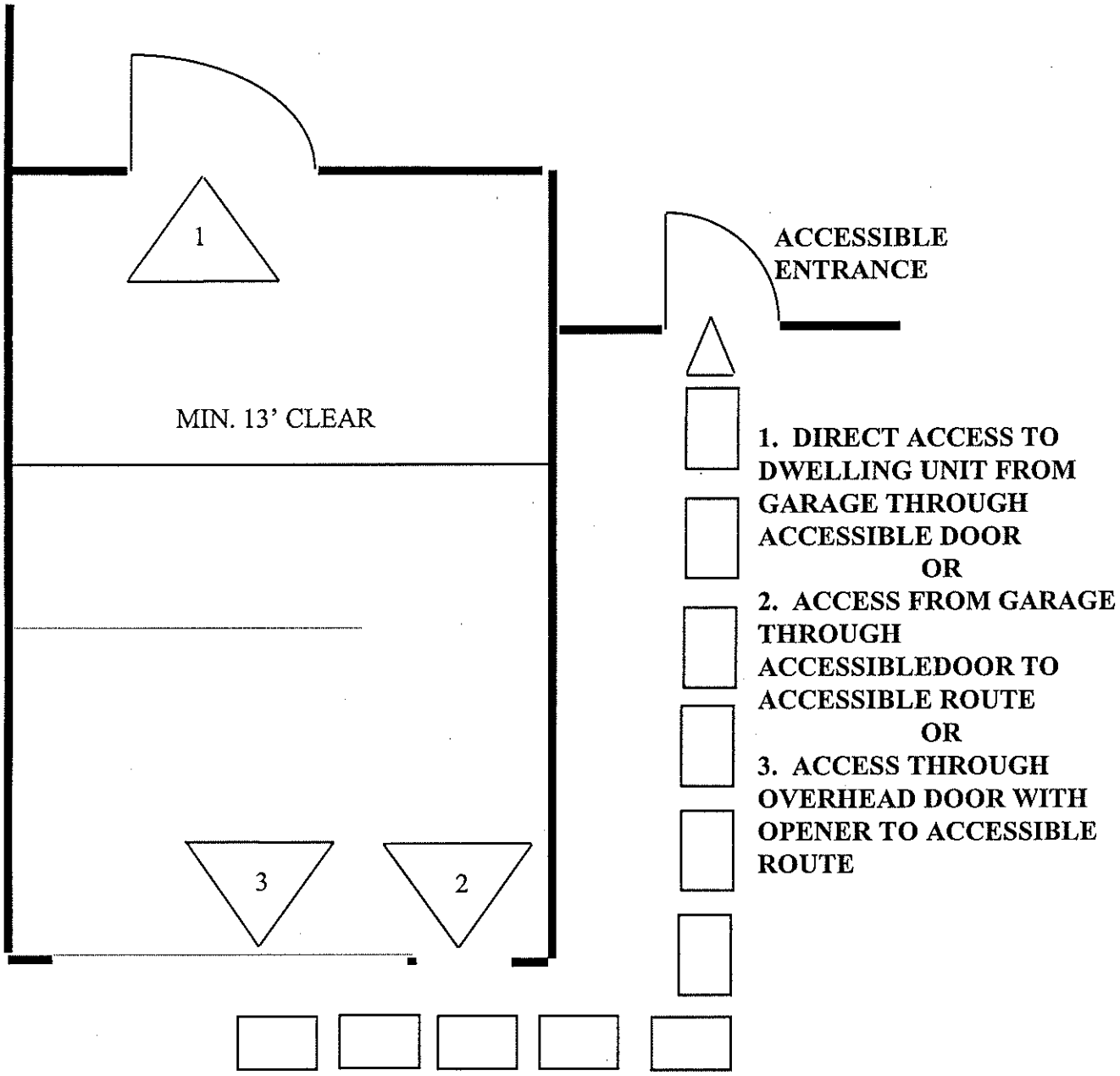
If underground parking garages include common use parking for persons other than residents of the building, the parking for these persons shall comply with Table 57.82, which in turn references ADAAG.

Private attached garages shall have one of three routes into the dwelling unit.

They shall have access directly into the dwelling unit by a walk door or a walk door shall be provided from the garage to an accessible walk to the accessible entrance of the dwelling unit or an automatic overhead garage door with automatic opener shall provide access to an accessible walk to the accessible entrance of the dwelling unit.

***Question:** If there is an accessible entrance from the garage directly into the dwelling unit, is another entrance required to the dwelling units?*

***Answer:** Yes. The accessible entrance through the garage does not provide a common entrance for anyone visiting the residence . An entrance to the dwelling units other than through a garage is also required.*



COMM 57.82(2) ACCESSIBLE PRIVATE ATTACHED GARAGES

TABLE 57.82

BASIC COMPONENTS FOR ACCESSIBLE AND USABLE PUBLIC AND COMMON USE AREAS OR FACILITIES

Accessible element or space	ADAAG Section	Application
1. Accessible route(s).....	4.3	(1) Except as specified in (2), within the boundary of the site: (a) From public transportation stops, accessible parking spaces, accessible passenger loading zones, and public streets or sidewalks to accessible building entrances. (b) Connecting accessible buildings, facilities, elements and spaces that are on the same site. Handrails are not required on accessible walks. Handrails shall be provided on ramps with a slope of 1:12. (c) Connecting accessible building or facility entrances with accessible spaces and elements within the building or facility, including adaptable dwelling units. (2) Where site or legal constraints prevent a route accessible to persons using wheelchairs between covered multifamily dwellings and public or common use facilities elsewhere on the site, a vehicular route may be provided as an alternative accessible route, providing there is accessible parking at each facility. Other site provisions shall comply with the applicable portions of this table.
2. Protruding objects.....	4.4	Accessible route or maneuvering space including, but not limited to, halls, corridors, passageways or aisles.
3. Ground and floor surface treatments	4.5	Accessible routes, rooms and spaces, including floors, walks, ramps, stairs and curb ramps.
4. Parking and passenger loading zones	4.6.6	If provided, accessible parking at covered multifamily housing shall comply with s. COMM 57.82 (2). If provided, passenger loading zones shall comply with ADAAG 4.6.6.
5. Curb ramps	4.7	Accessible routes crossing curbs.
6. Ramps.....	4.8	Accessible routes with slopes greater than 1:20 shall comply with ADAAG 4.8, except the ramp width shall be at least 48 inches.
7. Stair	4.9	Stairs on accessible routes connecting levels not connected by an elevator. Stairs not on accessible routes shall comply with s. COMM 57.07.
8. Elevator	4.10	If provided, elevator shall comply with s. COMM 52.04 and ch. COMM 18.
9. Platform lift	4.11	May be used in lieu of an elevator or ramp only as specified in s. COMM 52.04.
10. Drinking fountains and water coolers	4.15	Fifty percent of fountains and coolers on each floor, or at least one, if provided in the facility or at the site.
11. Toilet rooms and bathing facilities (including water closets, toilet rooms and stalls, urinals, lavatories and mirrors, bathtubs, shower stalls an sinks)	4.22	Where provide in public use and common use facilities, at least one of each fixture provided per room.
12. Seating, tables or work surfaces	4.32	If provided in the facility or at the site.
13. Places of assembly.....	4.33	If provided in the facility or at the site.
14. Common use spaces and facilities (including swimming pools, playgrounds, entrances, rental offices, lobbies, elevators, mailbox areas, lounges, halls and corridors, and the like).....	4.1 through 4.33	If provided in the facility or at the site: (a) Where multiple recreational facilities such as, but not limited to, tennis or racquetball courts, are provided at least 10% with a minimum of one recreation or game area of each type shall be accessible. (b) Access is required to all spectator viewing areas for recreational facilities. (c) Access is required only to the deck area of such facilities as, but not limited to, swimming pools and whirlpools. (d) Where practical, access to all or a portion of nature trails and jogging paths.
15. Laundry rooms.....	4.32.6	If provided in the facility or at the site, at least one of each type of appliance provided in each accessible laundry area shall be accessible. Where washers are provided, at least one washer shall be font-loading.

COMM 57.83 USABLE DOORS.

All covered multifamily housing shall provide usable doors as follows:

(1) PUBLIC AND COMMON USE AREAS.

(a) *Doorways.* All doorways that are part of an accessible route in the public and common use areas of covered multifamily housing shall have a minimum clear opening of 32 inches in width and shall comply with the applicable portions of Table 57.82, and Figures 57.83-1 and 57.83-2.

(b) *Double leaf doorways.* Where double leaf doorways are used in covered multifamily housing at least one door leaf shall provide a minimum clear opening of 32 inches in width.

(c) *Lever door handles.* Lever door handles shall be provided on all entrance and exit doors and on all entrance doors to individual dwelling units of covered multifamily housing.

(2) INDIVIDUAL DWELLING UNITS.

(a) *Doorways.* All single leaf doorways and at least one door leaf of double leaf doorways into and within individual dwelling units shall provide a minimum clear opening of at least 32 inches nominal width between the face of the door and stop.

Note: A 34-inch door, hung in the standard manner, provides an acceptable nominal 32-inch clear opening. This door can be adapted to provide a wider opening by using offset hinges, by removing lower portions of the door stop or both. Pocket or sliding doors are acceptable doors in covered multifamily dwelling units and have the added advantage of not impinging on clear floor space in small rooms. The nominal 32-inch clear opening provided by a standard six-foot sliding patio door assembly is acceptable.

Separate entrances to, and exits from, living units may have storm or screen doors installed. They are not subject to the doors in series requirements that common doors are.

(b) *Doorways and Corridors.* All doorways and corridors shall be designed to provide access and shall comply with the minimum design standards specified in Figure 57.83-2.

(c) *Lever door handles.* Lever door handles on interior dwelling unit doors may be requested by the renter and shall be provided by the landlord at no additional cost to the renter.

COMM 57.83 What doors are required to be 32 inches clear?

All doors in covered multifamily dwelling units that have accessible features are required to have a minimum 32-inch clear opening. This includes garage doors, doors to basement stairs and doors to second story stairs at the accessible floor level.

Patio or deck doors on the accessible floor levels shall have a minimum 32-inch clear opening. Closets more than 24 inches in depth shall have accessible doors.

FIGURE 57.83-1 CLEAR DOORWAY WIDTH AND DEPTH

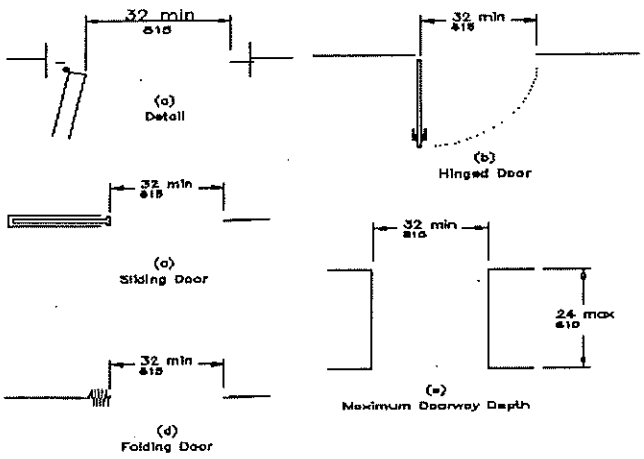
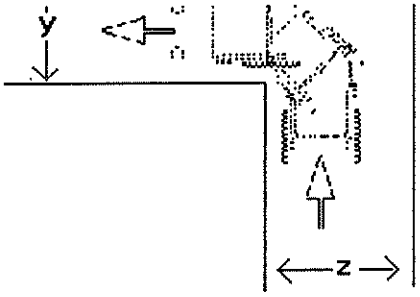


FIG. 24
Clear Doorway Width and Depth

FIGURE 57.83-2 DOORWAYS AND CORRIDORS



MINIMUM CLEAR DOORWAY AND CORRIDOR DIMENSIONS

CORRIDOR WIDTH	DOORWAY CLEARANCES	
Z Dimension[1]	X (Straight Run)	Y (90 Degree Turn)
36 inches	32 inches	36 inches
38 inches	32 inches	36 inches
40 inches	32 inches	34 inches
42 inches and greater	32 inches	32 inches

[1] The corridor width, Z dimension, shall be maintained for a distance of at least 5 feet from the edge of the door opening.

COMM 57.84 ACCESSIBLE ROUTE INTO AND THROUGH THE COVERED DWELLING UNIT.

(1) ACCESSIBLE ROUTE. Except as specified in sub. (2), an accessible route complying with the following requirements shall be provided throughout a dwelling unit in covered multifamily housing.

(a) *Minimum width.* An accessible route shall provide a minimum clear width of 36 inches.

(b) *Changes in floor level.* Within dwelling units, changes in floor levels between 1/4 inch and 1/2 inch shall be beveled with a slope no greater than 1:2. Changes in level greater than 1/2 inch shall be ramped in accordance with the applicable portions of Table 57.82.

(c) *Thresholds at exterior doors.* Thresholds at exterior doors, including sliding door tracks, shall be no higher than 3/4 inch. Thresholds and changes in level at exterior door locations shall be beveled with a slope no greater than 1:2.

(d) *Exterior landing.*

1. Except as specified in subd. 2., an exterior landing shall be provided at all required exits or entrances of covered multifamily housing and the landing shall be no more than 1/2 inch below the floor level of the interior of the dwelling unit. The exterior landing shall have a side slope not greater than 1/8 inch per foot and shall be at least 5 feet deep measured perpendicular to the door and shall provide at least 18 inches of clear landing surface adjacent to the door knob side of the door.

2. Exterior deck, patio or balcony surfaces shall be no more than 1/2 inch below the floor level of the interior of the dwelling unit, unless the exterior deck, patio or balcony surfaces are constructed of impervious material such as, but not limited to, concrete, brick or flagstone. In such cases, the surface shall be no more than 4 inches below the floor level of the interior of the dwelling unit.

(2) EXCEPTIONS.

(a) *Raised or sunken areas.* An accessible route is not required to a raised or sunken area of an individual dwelling unit. The raised or sunken area shall not interrupt the accessible route throughout the remainder of the dwelling unit.

(b) *Single-level dwelling units with lofts.* Single-level dwelling units may include lofts. In single-level dwelling units with lofts, all spaces other than the loft shall be on an accessible route. All portions of a loft shall be open and unobstructed to the room in which they are located, except for columns and posts and protective walls or railings not more than 44 inches in height. The area of the loft shall not be more than one-third of the area of the floor level located directly below the loft in the dwelling unit.

(c) *Multilevel dwelling units in housing with elevators.* In multilevel dwelling units in buildings with elevators, an accessible route shall be provided on the level of the dwelling unit which is served by the building elevator and shall:

1. Include the primary entry to the dwelling unit;

2. Comply with the accessibility standards specified under this subchapter with respect to the rooms located on the entry or accessible floor; and

3. Contain a bathroom or a powder room which complies with ss. COMM 57.86 and 57.871.

COMM 57.84 What does the accessible route through the dwelling unit include?

The accessible route through a dwelling unit shall be at least 36 inches wide and provide uninterrupted access from the main dwelling unit door to the kitchen, bathroom or powder room, bedroom, deck, patio or balcony on the accessible floor level.

Lofts are exempt, provided that all other spaces within the unit are on an accessible route.

Sunken or raised functional areas are also exempt, provided that such areas do not interrupt the accessible route through the remainder of the dwelling unit.

An accessible floor shall contain at least a powder room or bathroom and one other livable room, such as a living room, den, recreation room, or bedroom.

COMM 57.85 LIGHT SWITCHES, ELECTRICAL OUTLETS, THERMOSTATS AND OTHER ENVIRONMENTAL CONTROLS IN ACCESSIBLE LOCATIONS.

Light switches, electrical outlets, thermostats, circuit controls and other environmental controls installed in covered multifamily housing shall be located for use by the tenant as follows:

(1) HEIGHT OF CONTROLS. Except as specified in sub. (2), operable parts of the controls shall be located no higher than 48 inches and no lower than 15 inches above the floor.

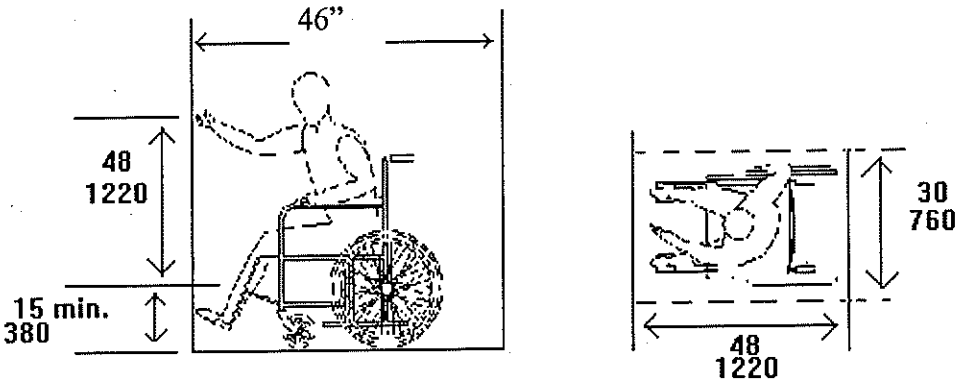
(2) HEIGHT OF CONTROLS OVER OBSTRUCTIONS. If a person is required to reach over an obstruction which is between 20 and 25 inches in depth, the maximum height shall be reduced to 44 inches for a forward approach or 46 inches for a side approach. Obstructions shall not extend more than 25 inches from the wall beneath a control.

COMM 57.85 *Do air conditioners and range hoods have to be accessible?*

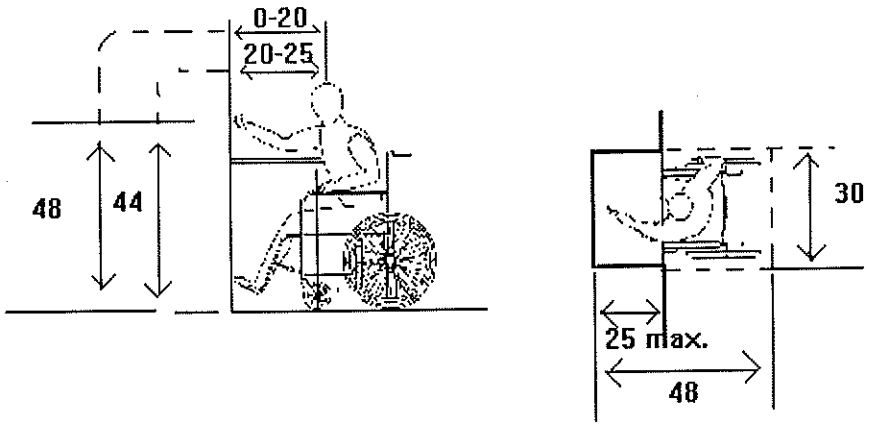
Electrical and environmental controls required to be accessible include air conditioners. A range hood is not required to be accessible as it is an appliance control.

Commentary for 57.85 Reach dimensions over an obstruction.

(THE FOLLOWING DIAGRAMS ARE COMMENTARY)

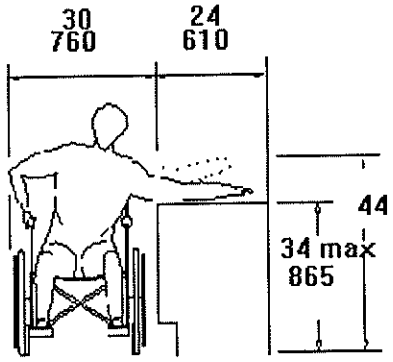


(a) Forward Reach Limit



Note: Clear knee space should be as deep as the reach distance

(b) Maximum Forward Reach Over an Obstruction



(c) Maximum Side Reach Over Obstruction

Question: *May kitchen counters be higher than 34"?*

Answer: *Yes. They may be standard available 36" height. It is recommended that the side reach range over them should be a maximum 44"*

COMM 57.86 REINFORCED WALLS FOR GRAB BARS.

All covered multifamily housing shall provide reinforced walls for grab bars as follows:

(1) LOCATION.

(a) Except as specified in sub. (2), reinforced bathroom walls shall be provided to allow the later installation of grab bars around the water closet, tub, shower stall and shower seat, where such facilities are provided. Reinforced areas shall be provided at least at those points where grab bars will be mounted as shown in Figures 57.86-1, 57.86-2 and 57.86-3.

(b) If a powder room, containing a water closet and sink, is the only toilet facility located on an accessible level of a multilevel dwelling unit, reinforced bathroom walls shall be provided to allow the later installation of grab bars around the water closet and sink.

(2) EXCEPTION. Where the water closet is not placed adjacent to a side wall, the areas where the installation of floor mounted, foldaway or similar alternative grab bars would be installed shall be reinforced.

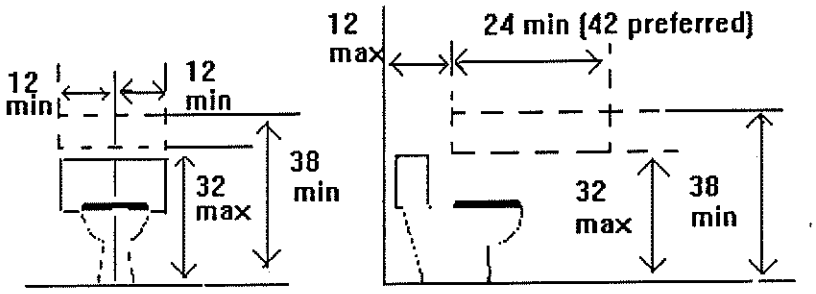
Note 1: A sunken tub placed away from walls could have reinforced areas for installation of floor-mounted grab bars. The same principle applies to shower stalls; for example glass-walled stalls could be planned to allow floor-mounted grab bars to be installed later.

Note 2: Reinforcement for grab bars may be provided in a variety of ways such as, by plywood or wood blocking, so long as the necessary reinforcement is placed so as to permit later installation of appropriate grab bars.

COMM 57.86 *Are shower or tub units which have reinforcing for grab bars acceptable?*

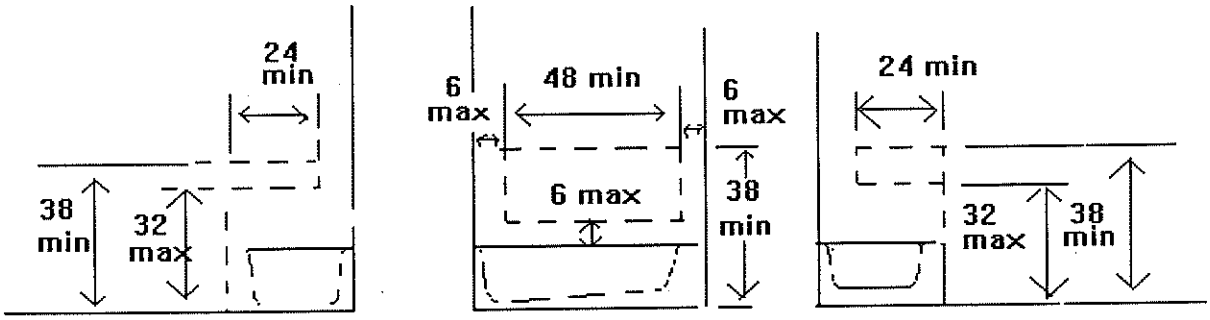
When bathtub/shower units are installed which are provided with their own grab bar reinforcing, additional wall reinforcing is not required if the manufacturer's specifications meet the requirements of this code section and the unit is installed per the manufacturer's instructions.

FIGURE 57.86-1
LOCATION OF GRAB BAR REINFORCEMENT
FOR WATER CLOSETS



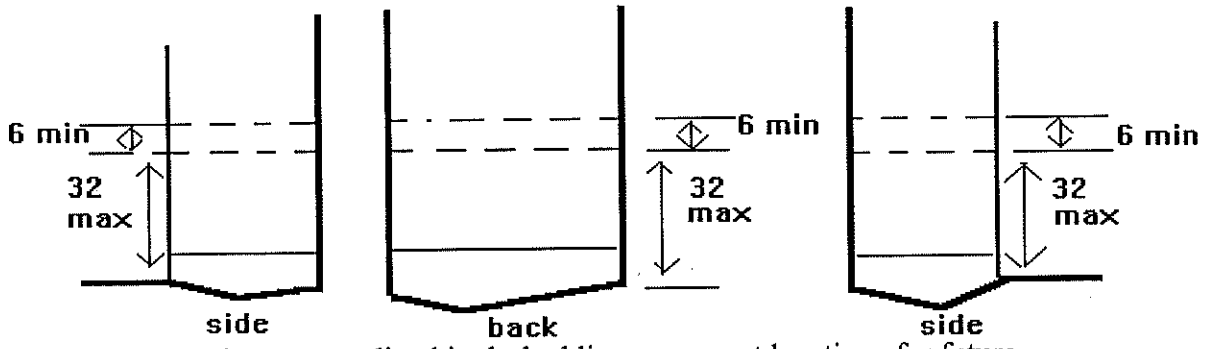
Reinforced Areas for Installation of Grab Bars

FIGURE 57.86-2
LOCATION OF GRAB BAR REINFORCEMENT FOR ADAPTABLE BATHTUBS



Note: The areas outlined in dashed lines represent locations for future installation of grab bars for typical fixture configurations.

FIGURE 57.86-3
LOCATION OF GRAB BAR REINFORCEMENTS FOR ADAPTABLE SHOWERS



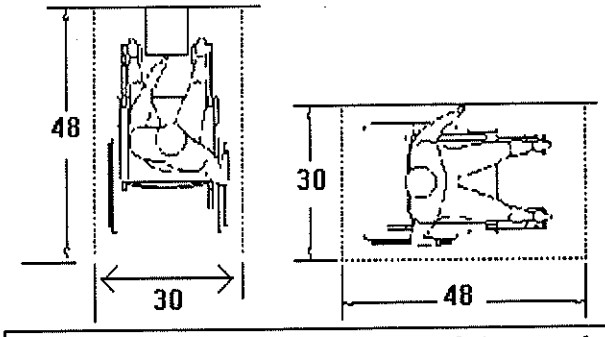
NOTE: The areas outlined in dashed lines represent locations for future installation of grab bars.

COMM 57.87 USABLE KITCHENS.

Kitchens of covered multifamily housing shall be designed and constructed as follows:

(1) CLEAR FLOOR SPACE. A clear floor space at least 30 inches by 48 inches that allows a parallel approach by a person in a wheelchair shall be provided at the range or cooktop and sink, and either a parallel or forward approach shall be provided at the oven, dishwasher, refrigerator, freezer or trash compactor.

Commentary for 57.87 Usable kitchens.
Minimum clear floor space for wheelchairs.



(a) Parallel Approach (b) Forward Approach

(2) CLEARANCE BETWEEN COUNTERS. Clearance between counters and all opposing base cabinets, countertops, appliances or walls shall be at least 40 inches.

(3) U-SHAPED KITCHENS. In U-shaped kitchens with a sink, range or cooktop at the base of the "U," a 60-inch turning radius shall be provided to allow a parallel approach, or the base cabinets shall be removable at that location to allow knee space for a forward approach.

COMM 57.871 USABLE BATHROOMS.

At least one bathroom in a dwelling unit shall be designed in accordance with sub. (2). All other bathrooms shall comply with sub. (1).

(1) BASIC USABILITY.

(a) *Design of bathroom.* Maneuvering space shall be provided within the bathroom for a person using a wheelchair or other mobility aid to enter and close the door, use the fixtures, reopen the door and exit. Doors may swing into the clear floor space provided at any fixture if the maneuvering space is provided. Maneuvering spaces may include any kneespace or toespace available below bathroom fixtures.

(b) *Clear floor space.* Clear floor space of 30 inches by 48 inches shall be provided at all fixtures. Clear floor space at fixtures may overlap.

Note 1: See Commentary diagrams at end of this chapter.) for examples of clear floor space at bathroom fixtures.

Note 2: Cabinets under lavatories are acceptable provided the bathroom has space to allow a parallel approach by a person in a wheelchair. If a parallel approach is not possible within the space, any cabinets provided would have to be removable to afford the necessary knee clearance for forward approach.

(c) *Shower stall.* If a shower stall is the only bathing facility provided in the covered dwelling unit, the shower stall shall have an inside dimension at least 36 inches by 36 inches.

(2) HIGHER LEVEL OF USABILITY.

(a) *Design of bathroom.*

1. Where the door swings into the bathroom, a clear floor space of 30 inches by 48 inches shall be provided within the room for a person to position a wheelchair or other mobility aid clear of the swing of the door and to permit use of fixtures. This clear floor space may include any kneespace and toespace available below bathroom fixtures.

2. Where the door swings out of the bathroom, a clear floor space of 30 inches by 48 inches shall be provided within the bathroom for a person using a wheelchair or other mobility aid to position the wheelchair such that the person is allowed use of fixtures. Clear floor space shall be provided to allow persons using wheelchairs to reopen the door to exit.

Note: See Commentary diagrams at end of this chapter for examples of bathrooms complying with the higher level of usability.

(b) *Water closets.* Water closets shall be located within bathrooms so that a grab bar may be installed on one side of the water closet. In locations where water closets are adjacent to walls or bathtubs, the centerline of the water closet shall be a minimum of 18 inches from the obstacle. The side of the water closet without a grab bar shall be a minimum of 15 inches measured from the centerline of the water closet to the finished surface of adjacent walls, vanities or the edge of a lavatory.

Note: See Commentary diagrams at end of this chapter for examples of clear floor space at water closets.

(c) *Vanities and lavatories.* When two or more lavatories are provided in a bathroom, at least one lavatory shall be made accessible.

1. Vanities and lavatories shall be installed with the centerline of the lavatory a minimum of 15 inches, measured horizontally, from an adjoining wall or fixture.

2. The top of the fixture rim shall be a maximum height of 34 inches above the finished floor.

3. A clear floor space at least 30 inches by 48 inches shall be provided at a lavatory for either a parallel or front approach. If a front approach is used, full kneespace shall be provided below the lavatory at least 17 inches in depth. If kneespace is provided below the vanity, the bottom of the apron shall be at least 27 inches above the floor.

Note: See Commentary diagrams at end of this chapter for examples of clear floor space at lavatories.

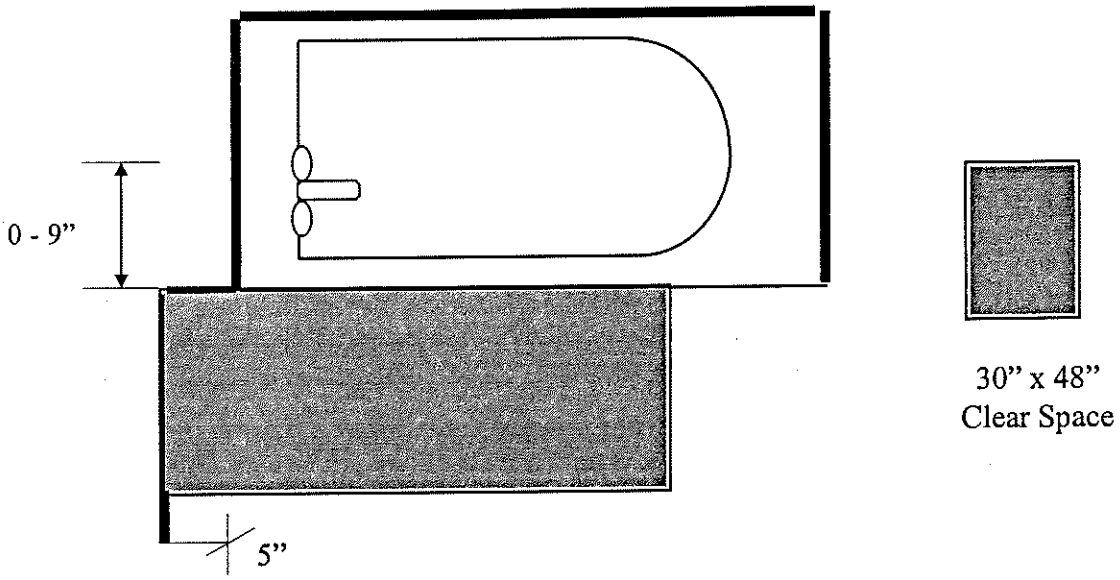
(d) *Bathtub and shower fixtures.* When both bathtub and shower fixtures are provided in the bathroom, at least one fixture shall be made accessible.

1. 'Bathtubs.'

a. Where the centerline of the controls are located not more than 9 inches from the apron of the bathtub, a clear floor space at least 30 inches by 48 inches shall extend at least 5 inches beyond the head of the bathtub as shown in Figure COMM 57.871-1.

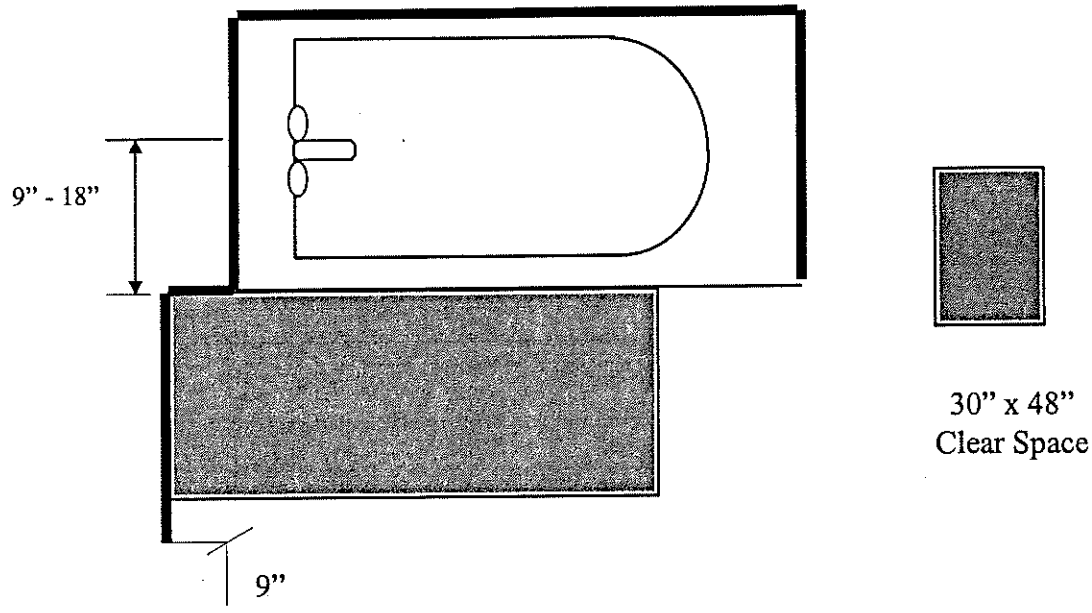
DRAWINGS ARE NOT TO SCALE

FIGURE 57.871-1
CLEAR FLOOR SPACE/OFFSET CONTROLS



b. Where the centerline of the controls are located between 9 inches and 18 inches from the apron of the bathtub, a clear floor space at least 30 inches by 48 inches shall extend at least 9 inches beyond the head of the bathtub as shown in Figure COMM 57.871-2.

FIGURE 57.871-2
CLEAR FLOOR SPACE/CENTERED CONTROLS



2. 'Shower stalls.'

a. Shower stalls in a bathroom shall have an inside dimension least 36 inches by 36 inches.

b. A minimum clear floor space 30 inches wide by 48 inches shall be provided outside the stall.

Note: See Commentary diagrams at end of this chapter. for examples of clear floor space.

c. If the shower stall is the only bathing facility provided in the covered dwelling unit, or on the accessible level of a covered multilevel unit, the shower stall shall have reinforcing to allow for installation of a wall hung bench seat.

COMM 57.871(1)&(2) *Maneuvering space shall be provided to use the fixtures in either bathroom size.*

COMM 57.871 (2) *In the higher level of usability bathrooms, a clear 30-inch by 48-inch space shall be provided along side and parallel to the tub or shower for transfer purposes.*

If a shower is to be the accessible bathing facility, it shall be provided with reinforcing to allow a shower seat to be installed for transfer. The inside dimensions of the shower shall be 36 inches by 36 inches. A roll-in shower may be provided in lieu of the 36-inch by 36-inch unit. A roll-in shower may not have a curb, shall be 30 inches by 60 inches, shall have blocking for grab bars and a hand held shower unit shall be provided.

The shower hose is required to be hand held with a length of 72 inches to hand.

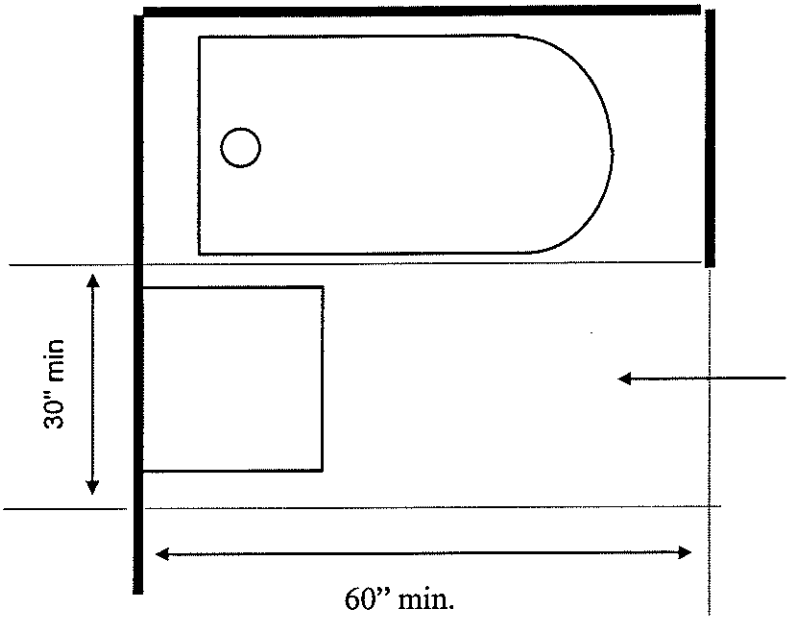
(3) POWDER ROOMS. Where a powder room is the only toilet room provided on the grade-level floor of a multilevel dwelling unit, the powder room shall be designed and constructed in accordance with the applicable portions of sub. (2).

It should also be understood that a powder room provided on the grade level floor in conjunction with another bathroom of higher usability must still meet basic usability requirements.

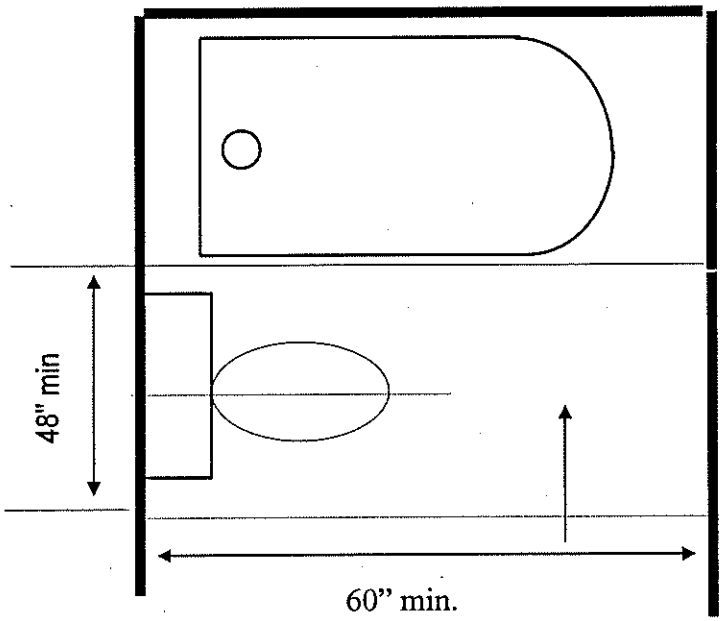
Note: See Commentary diagrams at end of this chapter for examples of adaptable powder rooms.

(4) SINGLE-LEVER PLUMBING CONTROLS. Single-lever plumbing controls or other controls which are approved by the department, may be requested by the renter for installation on plumbing fixtures used by the renter and shall be provided by the landlord at no additional cost to the renter.

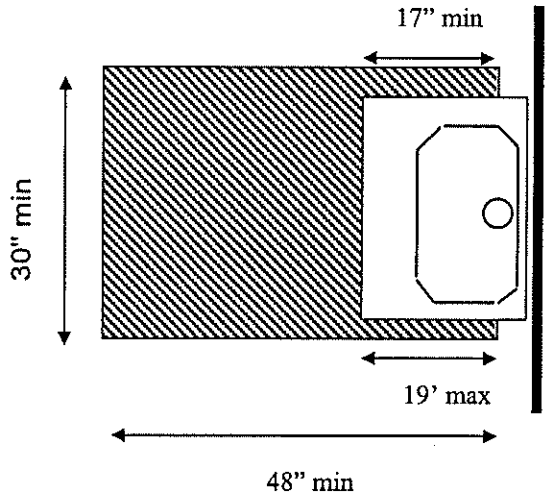
Commentary for 57.871 (1) BASIC USABILITY: Clear floor space at bathtubs.



Commentary for 57.871 (1) BASIC USABILITY: Clear floor space at bathtubs

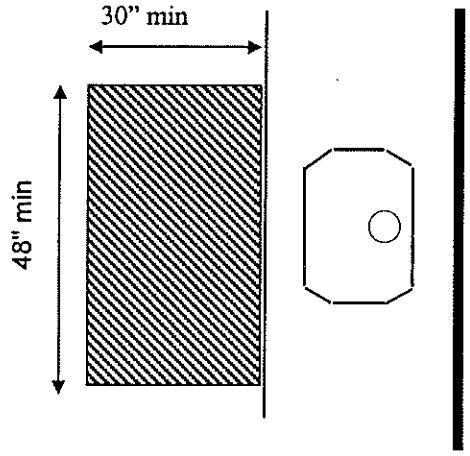


Commentary for 57.871 (1) BASIC USABILITY and 57.871 (2) HIGHER USABILITY: Clear floor space at lavatories:



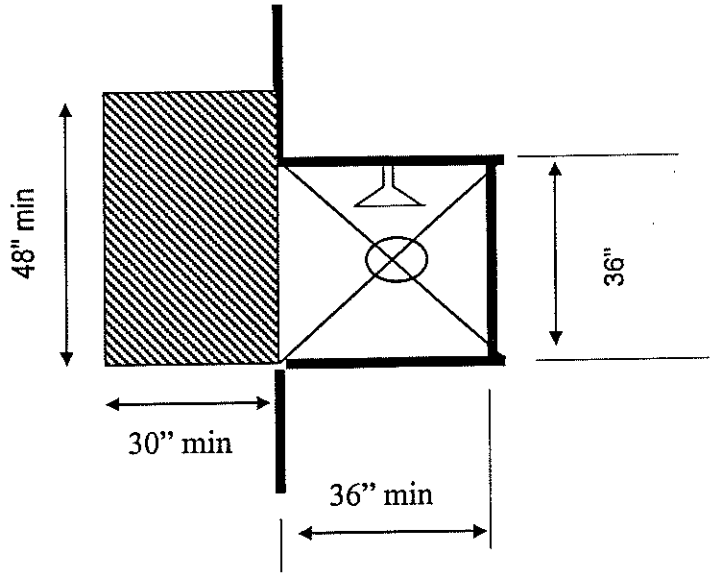
Lavatory With Knee Space

Commentary for 57.871 (1) BASIC USABILITY and 57.871 (2) HIGHER USABILITY: Clear floor space at lavatories:

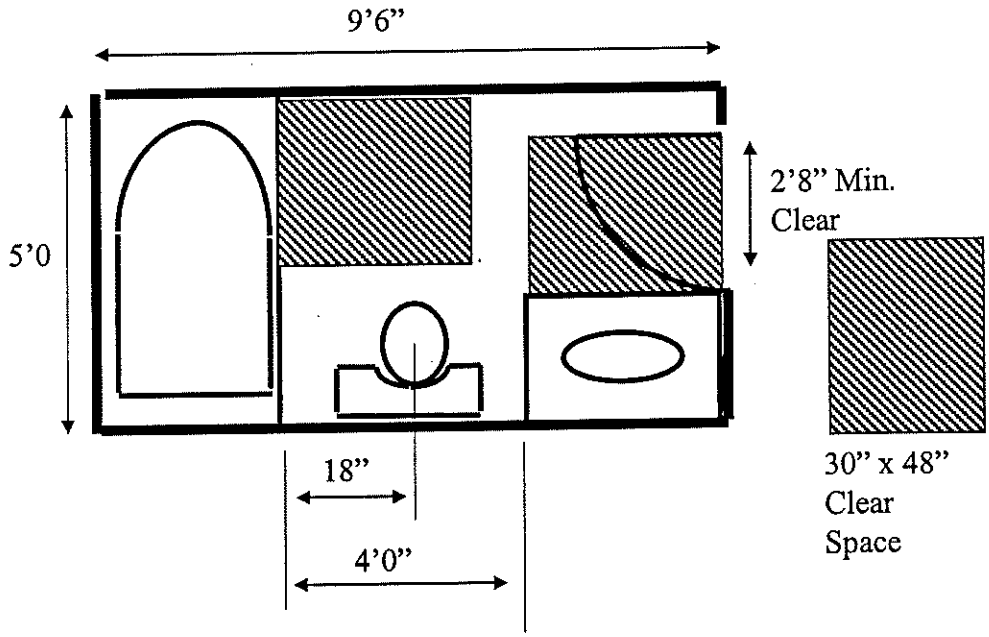


Lavatory Without Knee Space

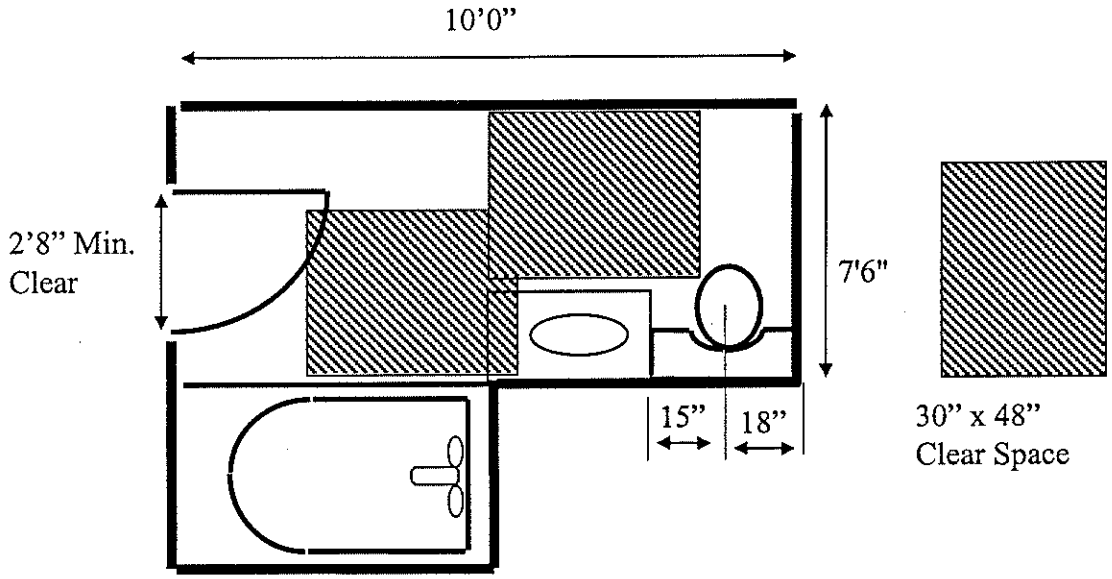
Commentary for 57.871 (1) BASIC USABILITY and 57.871 (2) HIGHER USABILITY: Clear floor space at showers:



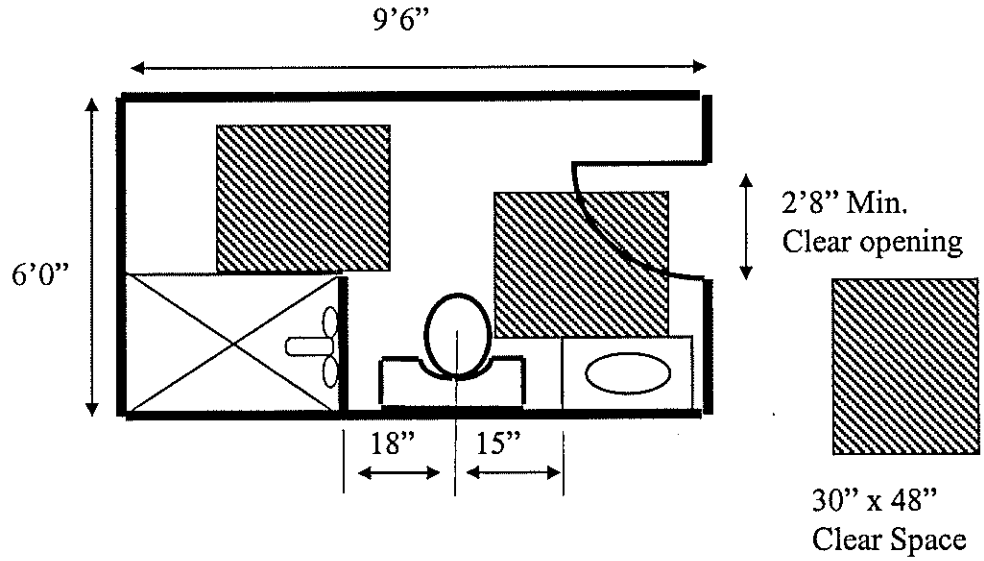
Commentary for 57.871 (1) BASIC USABILITY: Example of a complete bathroom complying with basic usability:



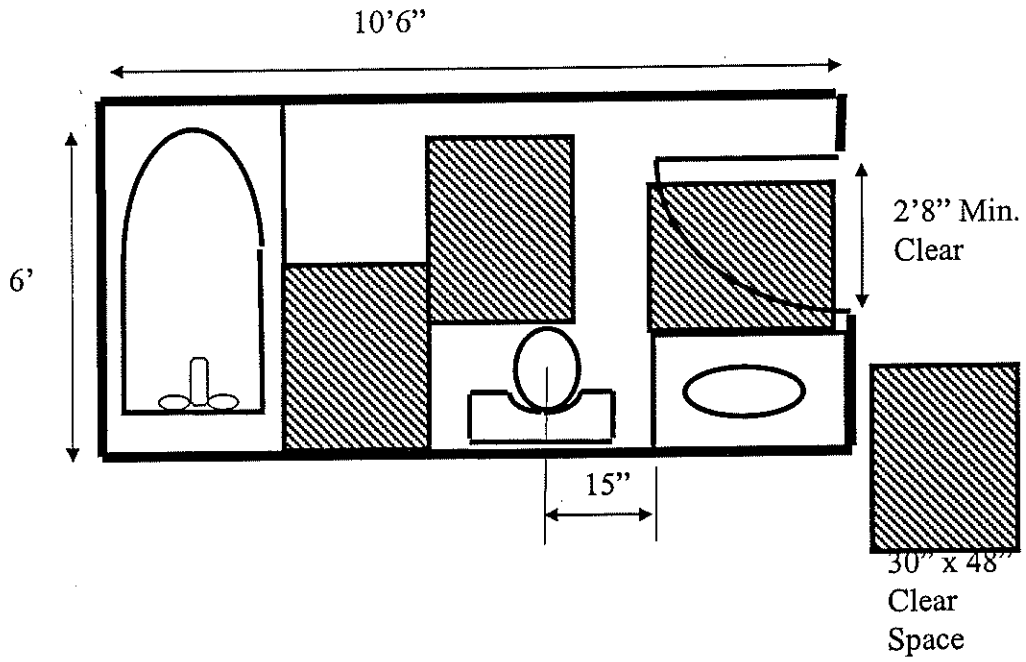
Commentary for 57.871 (2) HIGHER LEVEL OF USABILITY: Examples of complete bathrooms complying with the higher level of usability:



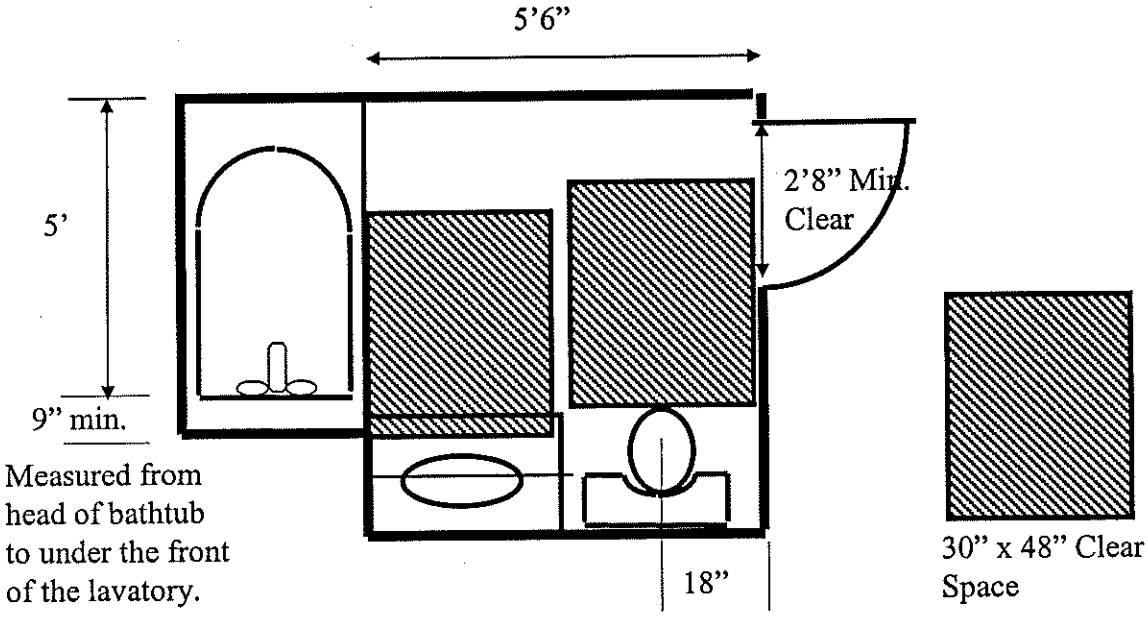
Commentary for 57.871 (2) HIGHER LEVEL OF USABILITY: Examples of complete bathrooms complying with the higher level of usability:



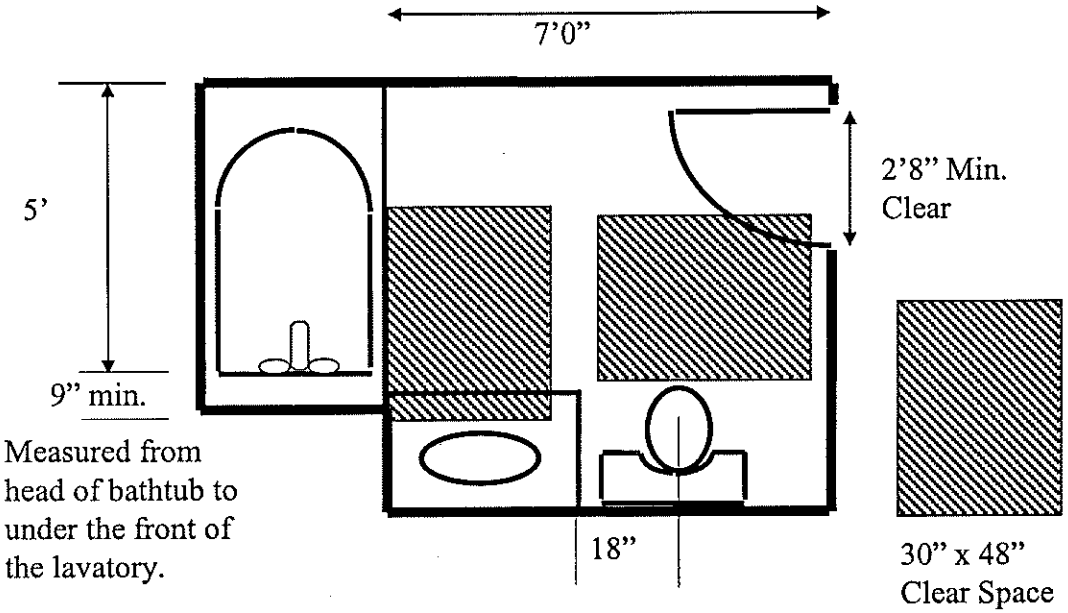
Commentary for 57.871 (2) HIGHER LEVEL OF USABILITY: Examples of complete bathrooms complying with the higher level of usability.



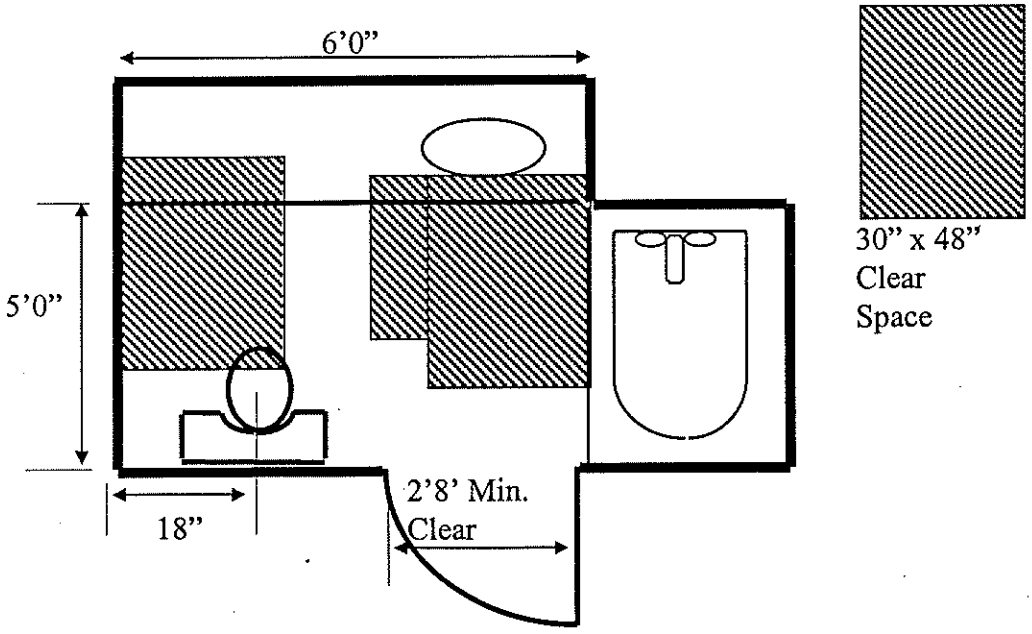
Commentary for 57.871 (2) HIGHER LEVEL OF USABILITY: Examples of complete bathrooms complying with the higher level of usability



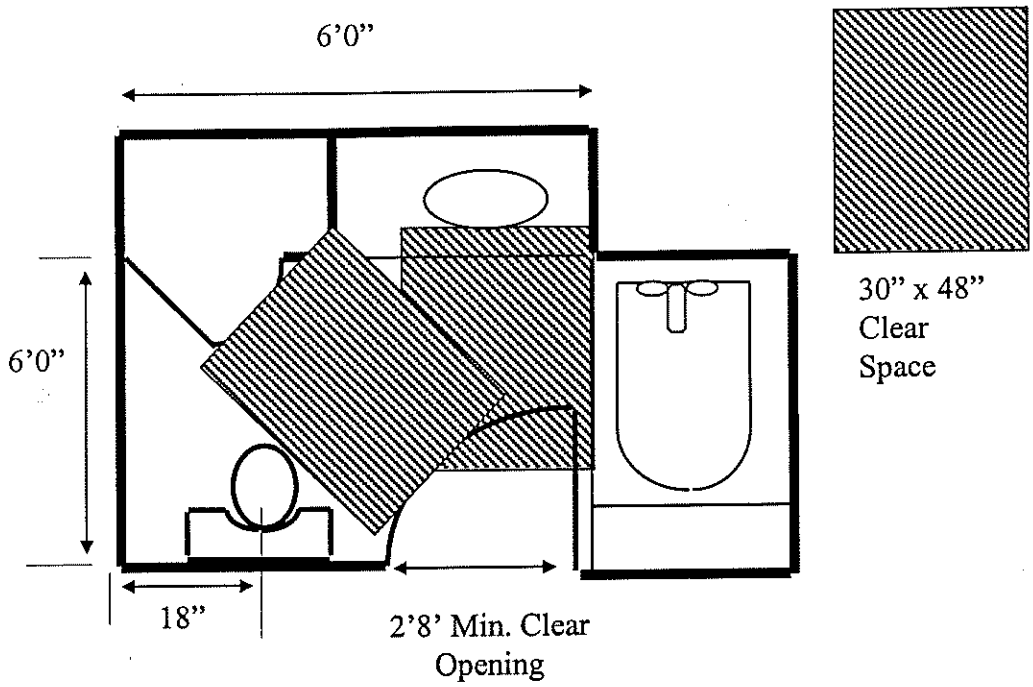
Commentary for 57.871 (2) HIGHER LEVEL OF USABILITY: Examples of complete bathrooms complying with the higher level of usability



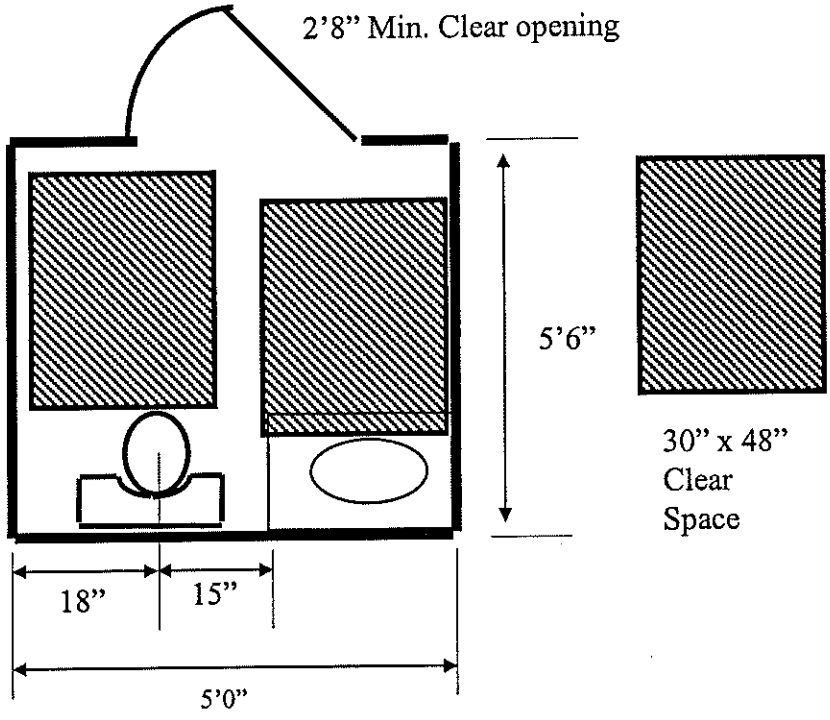
Commentary for 57.871 (2) HIGHER LEVEL OF USABILITY. Examples of complete bathroom complying with the higher degree of usability



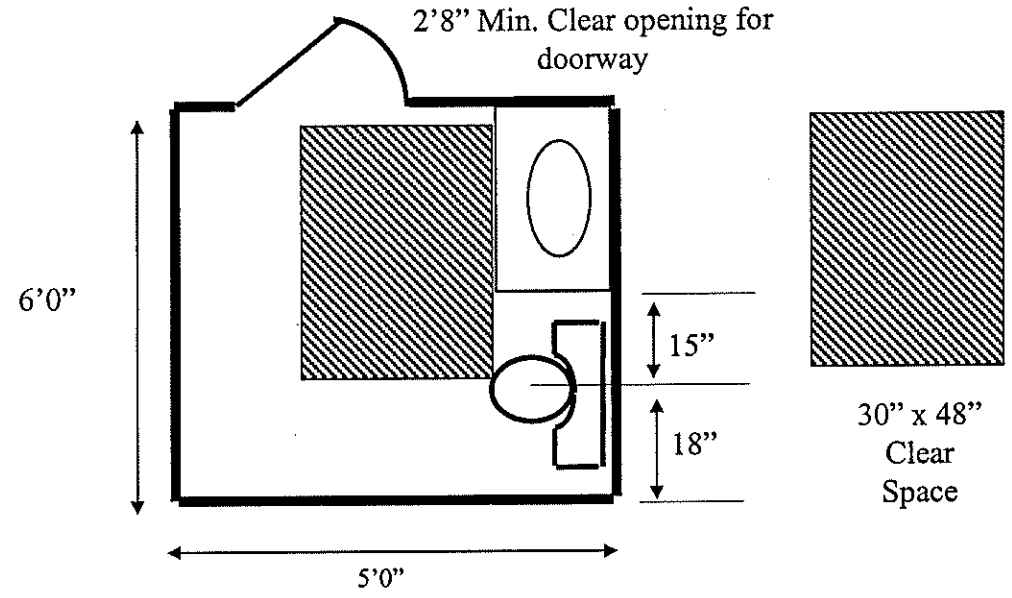
Commentary for 57.871 (2) HIGHER LEVEL OF USABILITY. Examples of complete bathroom complying with the higher degree of usability



Commentary for 57.871 (3) POWDER ROOMS: Examples of adaptable powder rooms:



Commentary for 57.871 (3) POWDER ROOMS: Examples of adaptable powder rooms



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Chapter COMM 58

HEALTH CARE FACILITIES AND PLACES OF DETENTION

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This occupancy chapter was created in 1982 in order to better deal with the specialization associated with institutional type facilities such as hospitals, nursing homes, and detention facilities. Requirements relative to the above uses were previously reviewed under the scope of Chapter COMM 57.

Subchapter I — Health Care Facilities

Part 1 — Scope

Effective October 1, 1995, jurisdiction for state building plan review and inspection of nursing homes and hospitals was transferred to the Department of Health & Family Services (DHFS). Contact them at (608) 266-8084 or (608) 266-4335 for plan submittal information. Buildings containing other occupancies will also be reviewed by that agency, unless they are separated from the nursing home or hospital by an unpierced, 4-hour rated building division wall or by a pedestrian access structure designed per Ch. Comm 62.

COMM 58.001 SCOPE.

(1) GENERAL. The provisions of this subchapter shall apply, on or after the effective date of this section, to the following:

(a) New health care facilities and additions to existing health care facilities;

(b) Alterations and remodeling affecting structural strength, fire hazard, natural lighting or replacement of major equipment. Alterations and remodeling do not include minor repairs necessary for the maintenance of any building or structure. Where buildings are being remodeled or altered, only those components or systems being remodeled or altered shall be made to conform with the rules in effect at the time the remodeling or alteration occurs; and

(c) Change of use where the requirements for the new use are more stringent than those for the previous use.

The purpose of this is to eliminate the "more restrictive shall apply" clause of s. COMM 50.02.

Portions or elements of existing facilities that are being remodeled shall be brought up to new construction standards. Some of these requirements may be more restrictive and some less restrictive, e.g. corridor requirements.

Some new requirements may be economically unreasonable and physically difficult ot achieve in existing buildings, e.g. corridor widths. If so, a petition for variance may be submitted.

(2) APPLICATION.

(a) The rules of this subchapter are not retroactive unless specifically stated in the individual administrative rule.

(b) The rules of this subchapter do not apply to alterations or remodeling of buildings, constructed prior to the effective date of this paragraph, being undertaken solely for the purpose of obtaining federal certification or state licensure.

(c) Where other sections of chs. COMM 50-64 specify different requirements than those contained in this subchapter, the requirements of this subchapter shall govern.

(3) VARIANCE. Where explicit conformance with the rules of this subchapter is not attained, the department will consider and may grant a variance as specified in s. COMM 50.25. The department will consider the results obtained from nationally recognized evaluation procedures

(for example, Fire Safety Evaluation System (FSES) as specified in Appendix C of the National Fire Protection Association (NFPA) Life Safety Codes 101-1981) in evaluating requests for variance.

Special Note: The purpose of this subchapter is to eliminate conflicting rules between the Dept. of Commerce and DH&FS. DH&FS is involved with the enforcement of the federal requirements for the Title XVIII (Medicare) and Title XIX (Medicaid) programs. Since the basis of the federal program for construction purposes is compliance with the NFPA, 101 Life Safety Code, the rules of this subchapter reflect the rules of the NFPA, 101 Life Safety Code, 1981 edition.

Special Note: *It must be noted that although the rules of this portion of the occupancy chapter were written to be in alignment with the Life-Safety Code used for licensing requirements, always remember that this is not an adoption of the Life-Safety Code. The exceptions currently referenced in the code reflect the provisions of the 1981 version of the Life-Safety Code and have not all been modified to reflect the more current versions of that code. DHFS uses the 1991 version of the Life-Safety Code.*

Although provisions and exceptions outlined in the newer versions of the Life-Safety Code are being used and accepted by DHFS, the licensing agency, but when those exceptions are less stringent and in conflict with this occupancy chapter's requirements, these requirements will govern. DHFS uses the most current versions of the Life-Safety Code and may review a petition for variance as outlined in s. COMM 50.25. That procedure is used to establish equivalency to the intent of the code, which in part was intended to provide alignment between the Dept. of Commerce and DHFS.

Part 2 — General Requirements

COMM 58.01 CLASS OF CONSTRUCTION.

(1) **TWO OR MORE STORIES.** Except as provided in par. (d), all health care facilities 2 or more stories in height shall be of fire-resistive type 1 construction as specified in s. COMM 51.03 (1) with the following modifications:

(a) *Floor framing support assemblies.* Floor framing support assemblies shall have a minimum fire-resistive rating of 2 hours.

This reference to the 2-hour fire-resistive rating is intended to apply to lines 3 and 4 of Table 51.03-A. The confusion is created when the "minimum" referenced in Chapter 58 are also used as the "maximum" rating requirements for the column requirements in lines 1 and 2 of Table 51.03-A. Also see DHFS structural requirements in the 1991 Life Safety Code section 12-1.6.2.

(b) *Roof assemblies.* Roof assemblies shall have a minimum fire-resistive rating of 1 1/2 hours.

The hourly rating referenced is an increase in the minimum rating currently shown in Table 51.03-A.

(c) *Exterior bearing walls.* All exterior bearing walls shall have a minimum fire-resistive rating of 3 hours.

(d) Health care facilities up to and including 3 stories in height may be of Type 3 construction if completely protected by an approved automatic fire sprinkler system.

(2) **ONE-STORY CONSTRUCTION.**

(a) *Hospitals.*

1. Except as provided in subd. 2., one story hospitals shall be of type 3 metal frame protected construction or better as specified in Table 51.03-A with the following specifications:

a. Roof framing assemblies for types 1, 2 and 3 construction shall have a minimum fire-resistive rating of one hour.

This reference to the minimum rating is necessary as Table 51.03-A would allow an NC-0 rating in a limited number of instances.

b. All exterior bearing walls of type 3 construction shall have a minimum fire-resistive rating of one hour.

This is again an increase from the minimum requirement referenced under Table 51.03-A which would allow an NC-0 rating for walls with large setback areas. A problem will arise if the minimum is considered a "maximum" when the setback requirements demand an increase to an NC-2 rating.

2. One story hospitals provided with a complete automatic fire sprinkler system installed in accordance with s. COMM 51.23 may be of type 7, wood frame protected construction or better as specified in Table 51.03-A.

(b) *Nursing homes.* One story nursing homes shall be of type 7 wood frame protected construction or better as specified in Table 51.03-A.

COMM 58.02 OCCUANCY SEPARATIONS AND HAZARD ENCLOSURES.

Occupancies within the scope of this chapter shall be separated from other occupancies or uses in accordance with s. COMM 51.08. Hazards shall be enclosed in accordance with s. COMM 51.08.

The occupancy separation requirement of COMM 51.08 must not be confused with a class of construction separation requirement as outlined in s. COMM 51.02 (20). Also be aware of footnote a. to Table 51.08-1 regarding the exemption of other occupancies related to a health care occupancy from needing an occupancy separation.

COMM 58.03 WINDOWS.

(1) OUTSIDE WINDOWS. Every habitable room shall be provided with outside windows having a total glazed area of at least 8% of the floor area of the room. The bottom of the window opening in sleeping rooms shall be not more than 36 inches above the floor.

Day room areas could be considered habitable rooms [see s. COMM 51.01 (67a)] when "living" type space is not provided within each resident's room.

(2) VENTILATION.

(a) *Where required.* Every patient sleeping room and every habitable room shall have an outside window or outside door located so it can be opened from the inside to permit the venting of products of combustion and to permit any occupant to have direct access to outside air in case of an emergency. Where windows require the use of tools or keys for operation, written approval from the department shall be obtained. The keys or tools shall be accessible to staff and located on each floor having such windows.

(b) *Openable area of outside windows.* The openable area of outside windows shall be equal to at least 4% of the floor area served, except as follows:

1. Rooms intended for occupancy for less than 24 hours, such as those housing obstetrical labor beds, recovery beds, observation beds in emergency department and newborn nurseries;

The exception referenced is related to only the "openable" requirement for windows, not to eliminate the windows and natural light associated with same. The borrowing of light is not allowed except through the petition for variance procedure. See the Life Safety Code for exceptions for obstetrical nurseries intended for less than 24 hour stays.

2. Rooms where persons are forcibly confined, such as psychiatric wards, alcohol and drug abuse areas or other similar areas of protective placement; or

3. Buildings designed with an engineered smoke control system as specified in NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems.

Part 3 —Means of Egress Requirements

COMM 58.04 REQUIRED MEANS OF EGRESS.

(1) GENERAL. All required means of egress shall comply with the requirements as specified in s. COMM 51.15, except as modified in this section.

(2) EXIT DOORS.

(a) *Width.* All exit doors shall be not less than 44 inches and not more than 48 inches in width, except that doors serving enclosed stairways may be a minimum of 36 inches in width.

(b) *Door swing.* A door which is used by 25 persons or less shall not be required to open in the direction of egress.

(c) *Force to open door.* The force required to fully open doors shall not exceed 37 pounds applied to the latch side.

(d) *Door platforms.* The floor on both sides of an exit door, except as specified in s. COMM 51.16 (4)(c), shall be at the same elevation and be level for a distance at least the width of the door, or as specified in s. COMM 52.04 (9)(b).

(3) EXIT ACCESS DOORS.

(a) *Width.*

1. All exit access doors from hospital and nursing home sleeping rooms; patient or resident use areas; diagnostic and treatment areas, such as x-ray, surgery, or physical therapy; and all doors between these spaces and the required exits shall be at least 44 inches wide.

2. Exit access doors not subject to use by patients, shall be at least 36 inches wide.

The minimum widths referenced in (2) and (3) are based on the leaf of the door. When double doors are used, a single leaf may be reduced to 34 inches provided it is used in conjunction with an inactive leaf which is at least 8 inches wide. The meeting edge must have a rabbet, bevel or astragal. A mullion is not permitted. A pair of doors without a mullion may be used for egress provided both leaves are arranged to swing in the direction of egress.

(b) *Door swing.* A door which is used by not more than 25 persons shall not be required to open in the direction of egress.

COMM 58.05 NUMBER AND TYPE OF EXITS.

(1) NUMBER. At least 2 exits, located remote from each other, shall be provided from each floor and fire section of the building.

(2) TYPE OF EXITS.

(a) At least one exit from each floor or smoke compartment shall be by a door leading directly to a stairway, smokeproof tower, ramp, horizontal exit, exit passageway, or to the outside of the building as specified in this subchapter.

(b) No more than one-half of the required exits shall be horizontal exits.

COMM 58.06 STAIRS.

(1) STAIR DETAILS. All stairs shall comply with the requirements specified in ss. COMM 51.16 and 51.164, except as modified in this section.

(a) All stairways and steps shall conform to the requirements of ss. COMM 51.16 to 51.166 except that steps shall have a rise of not less than 4 inches measured from tread to tread, and treads shall be solid.

(b) Every landing or platform shall be at least as wide as the stairway, measured at right angles to the direction of travel. The length of every landing or platform shall be at least as wide as the stairway. The length of the landing or platform need not exceed 48 inches.

(c) The aggregate width for stairways shall comply with the requirements specified in s. COMM 58.12.

(2) ENCLOSURE.

(a) All stairways shall be enclosed as specified in s. COMM 51.18.

(b) Stairways in addition to those required by these rules, need not lead to the outside, but shall comply with the enclosure requirements.

The enclosure requirements of s. COMM 51.18 requires the enclosing to occur at each floor level.

(c) Nonrequired exit stairways and ramps connecting different levels within the same floor as defined in s. COMM 51.01 (56a) are not required to be enclosed.

This section is trying to reference the fact that when a stairway traverses a change in elevation between floor levels of less than 3 feet, those two floor levels (i.e., leading to sunken lobbies/ waiting areas or to raised observation platform areas) are considered the same floor and thereby stairways need not be enclosed in any manner. Stairways and ramps such as this could be more aptly referred to as "exit access stairways."

COMM 58.07 HANDRAILS.

Handrails shall be provided as specified in s. COMM 51.161, except that handrails protecting the open sides of stairways and ramps shall have intermediate rails or an ornamental pattern designed to prevent the passage of an object with a diameter larger than 6 inches.

COMM 58.08 GUARDRAILS.

Guardrails shall be provided as specified in s. COMM 51.162, except that guardrails shall have intermediate rails or an ornamental pattern designed to prevent the passage of an object with a diameter larger than 6 inches.

COMM 58.09 SMOKEPROOF TOWERS.

Smokeproof stair towers shall comply with the requirements specified in ss. COMM 51.17, 58.04 and 58.06.

COMM 58.10 HORIZONTAL EXITS.

(1) GENERAL. Horizontal exits shall comply with the requirements specified in s. COMM 51.19, except as modified in this section.

(2) AREA. At least 30 net square feet per occupant in a facility shall be provided within areas such as corridors, patient rooms, treatment rooms, lounge or dining areas on each side of the horizontal exit for the total number of people in the adjoining compartment.

(3) DOORS.

(a) A single door used as a horizontal exit shall serve one direction only, be at least 44 inches wide, swing in the direction of egress and comply with the requirements specified in s. COMM 58.21.

(b) A horizontal exit in a corridor 8 feet or more in width serving as a means of egress from both sides of the doorway shall have the opening protected by a pair of swinging doors, arranged to swing in the opposite direction from the other, with each door being at least 44 inches wide.

(c) Center mullions are prohibited.

(d) A vision panel, complying with the requirements specified in s. COMM 51.048 and not exceeding 100 square inches, shall be provided in each horizontal exit door. Vision panels shall be set in steel frames and shall be tested as part of the entire rated door assembly.

(4) RESTRICTIONS. If a horizontal exit is used as a smoke barrier, it shall comply with the requirements specified in s. COMM 58.30.

COMM 58.11 RAMPS.

(1) MINIMUM WIDTH.

(a) *Interior ramps.* Interior ramps shall be a minimum of 44 inches wide, of which not more than 4 inches on each side may be occupied by a handrail.

(b) *Exterior ramps.* Exterior ramps shall be a minimum of 48 inches wide of which not more than 4 inches on each side may be occupied by a handrail.

(2) SLOPE. Ramps shall have a slope of not more than 1 foot of rise in 12 feet of run.

(3) ENCLOSURE. Ramps used as a required means of egress and that connect different floors shall comply with the enclosure requirements for stairways specified in s. COMM 58.06 (2).

(4) LANDINGS AND PLATFORMS.

(a) If a door is provided at the top or bottom or both of a ramp, a landing or platform shall be placed between the door and the ramp regardless of the direction of swing of the door.

(b) Every landing or platform shall be at least as wide as the ramp, measured at right angles to the direction of travel. The length of every landing or platform shall be at least as wide as the ramp, but need not exceed 48 inches.

COMM 58.12 CAPACITY OF MEANS OF EGRESS.

(1) OCCUPANT LOAD.

(a) *Capacity.* The occupant load for which means of egress shall be provided for any floor shall be the maximum number of persons to occupy that floor, but not less than one person for each 120 square feet gross floor area.

(b) *Exits serving more than one floor.* Where exits serve more than one floor, only the occupant load of each floor considered individually need to be used in computing the capacity of the exits at that floor, provided the exit capacity is not decreased in the direction of exit travel.

Where a true horizontal exit is provided, the department will allow use of these same provisions from side to side of the horizontal exit as already applies from floor to floor. The only requirement for adjacent occupants is to assure that adequate floor area exists on each adjacent side as outlined in s. COMM 58.10 (2). This follows the intent that a health care facility be designed to move patients to areas of refuge prior to evacuation.

(2) REQUIRED EXIT WIDTH.

(a) *Units of exit width.* The required exit width shall be measured in units of exit width of 22 inches. Fractions of a unit less than 12 inches shall not be counted. Fractions of a unit 12 inches or more, added to one or more full units, shall be counted as 1/2 unit of exit width.

(b) *Clear width.* The clear width of the means of egress shall be measured at the narrowest point of the exit component under consideration, except as provided below:

1. The exit width for doorways shall be the measured width of each door leaf;
2. A handrail may project inside the measured width on each side not more than 4 inches; or
3. A stringer may project inside the measured width on each side not more than 1 1/2 inches.

The key to adequately meeting the requirements for exit width is to analyze the capacity of each exit component separately. This will then provide to you the critical unit width required to be provided at each exit component which will, in turn, lead you to the occupant load capacity based on those units. Those results can then be compared to the floor areas and related capacities of the zones being analyzed for exit unit width requirements. Also, reasonable verified projections of number of persons or occupants may be considered.

(3) CAPACITY PER UNIT OF EXIT WIDTH.

(a) *Stairways.* The capacity of means of egress providing travel by means of stairs shall be 22 persons per exit unit, except that in buildings protected with a complete automatic sprinkler system the capacity shall not exceed 35 persons per exit unit.

(b) *Horizontal travel.* The capacity of means of egress providing horizontal travel, such as doors, ramps, or horizontal exits shall be 30 persons per exit unit, except that in buildings protected with a complete automatic sprinkler system the capacity shall not exceed 45 persons per exit unit.

Always use the more stringent of the two capacity requirements (horizontal travel versus vertical travel) when analyzing the capacity for stairway egress. A stairway is comprised of two types of

exit width capacity. The doorway leading into the stairway is compared against s. COMM 58.12 (b) and the stairway is compared against s. COMM 58.12 (3)(a).

COMM 58.13 ARRANGEMENT OF MEANS OF EGRESS.

(1) PATIENT SLEEPING ROOMS. Every patient sleeping room shall have an exit access door leading directly to an exit access corridor, except as provided below:

(a) If there is an exit door opening directly to the outside from the room at ground level; or

(b) One adjacent room, such as a sitting room or anteroom, may intervene, if all doors along the means of egress are equipped with nonlockable hardware, except as specified in s. COMM 51.15 (3), and if the intervening room is not used to serve as an exit access for more than 8 patient sleeping beds.

It should be noted that prior to the 1991 issue of the code, the requirements for egress from nonpatient room areas would be determined by reviewing those areas against the egress requirements of the occupancy chapter which best fit the area in question, whether an occupancy separation was provided or not. The occupancy separation requirements in s. COMM 58.02 were eliminated with only a reference back to s. COMM 51.08 and along with the deletion of the entire section went the reference to egress for use areas based on the type of use.

An example would be the exiting for a dining area for 500 persons which should be based on the egress requirements outlined in the assembly hall occupancy chapter, COMM 55, and another occupancy load capacity extreme would be the egress requirements for larger storage rooms which should be reviewed based on the egress requirements of the factory, office, and mercantile occupancy chapter, COMM 54. (See also Footnotes 51.08(2) & (6))

(2) CORRIDORS. Every aisle, corridor and hallway shall provide access to at least 2 exits complying with the requirements specified in s. COMM 58.05.

(a) *Dead end corridor.* Every exit or exit access shall be so arranged that no corridor, aisle or passageway has a pocket or dead end exceeding 30 feet.

(b) *Exit access corridors.*

1. Every aisle, corridor and hallway used for exit access shall be at least 8 feet in clear and unobstructed width of which not more than 4 inches on each side may be occupied by a handrail.

2. Where doors are placed in the exit access corridor, they shall be a pair of doors, each at least 44 inches in width. Where the exit access corridor serves as a means of egress from both sides of the doorway, the doors shall be arranged to swing in the opposite direction from the other.

(c) *Areas not intended for patient use.* Aisles, corridors and hallways in areas not intended for the housing, treatment or use of patients shall be at least 44 inches in clear and unobstructed width.

(3) SUITE EXITING. Any room, suite of rooms, space or area more than 1,000 square feet in area, shall have at least 2 exit access doors remote from each other.

*The exit access corridor requirements are not carried into defined suite areas provided no other areas outside of the suite boundaries are required to use the corridors within the suite to meet **any** of their egress requirements. If other suites or other nonrelated use rooms/areas must use the corridors extending through the suite to meet any of their egress requirements, then those corridors*

must meet the requirements referenced by (2) as well as the requirements outlined in s. COMM 58.31.

COMM 58.14 MEASUREMENT OF TRAVEL DISTANCE TO EXITS.

All exits of health care facilities shall be located to provide remote means of egress.

(1) EXIT ACCESS TO AN EXIT. Travel distance measured along passageways between any room door required as an exit access and an exit shall not exceed 100 feet, except that in buildings protected with a complete automatic sprinkler system the distance shall not exceed 150 feet.

(2) ROOM TO AN EXIT. Travel distance measured along passageways between any point in a room and an exit shall not exceed 150 feet, except that in buildings protected with a complete automatic sprinkler system the distance shall not exceed 200 feet.

(3) SLEEPING ROOM TO AN EXIT ACCESS. Travel distance measured along passageways between any point in a health care sleeping room or suite and an exit access door to that room or suite shall not exceed 50 feet.

COMM 58.15 DISCHARGE FROM EXITS.

All required ramps or stairs serving as exits shall discharge directly to the outside at grade or be arranged to travel through an exit passageway discharging to the outside at grade. Unenclosed exterior ramps or stairways may not be used as required exits as specified in s. COMM 58.04.

COMM 58.16 ILLUMINATION OF MEANS OF EGRESS.

(1) ILLUMINATION. Artificial lighting shall be provided at all exits and for such period of times as required to maintain safe exiting.

(2) ILLUMINATION LEVEL. The floors of means of egress shall be illuminated at all points including angles and intersections of corridors and passageways, stairways, landings of stairs and exit doors to the values specified in ch. COMM 1

COMM 58.17 EMERGENCY LIGHTING.

Emergency lighting shall comply with the requirements specified in ch. COMM 16.

Be reminded that the "Guidelines" require emergency power for lighting and other essential power circuits. Also reference NFPA 70 and NFPA 99.

COMM 58.18 MARKING OF MEANS OF EGRESS.

(1) EXIT SIGNS. Every required exit shall be identified with an internal illuminated, red or green exit sign bearing the word "EXIT" or "OUT" in plain letters not less than 6 inches high, with the principal strokes of letters not less than 3/4 inches.

Question: *Can green lettering be used for exit signs in health care and detention or correctional facilities?*

Answer: *Yes. although sections COMM 58.18 (1) and 58.58 (1), which were created in 1981, required red signage in these facilities, the repeal and recreation of s. COMM 51.15 (5) in 1991 enabled this signage to be either red or green.*

Section COMM 51.15 (5)(a) (intro,.) states "All exit doors, unless otherwise exempted by the occupancy requirements of this code, shall be identified by illuminated translucent exit signs." Since s. COMM 51.15 (5)(a) 3. allows "red or green lettering and since neither s. COMM 58.18

(1) nor 58.58 (1) "exempt" health care and detention or correctional facilities from this lettering by specifying colors other than red and green, green exit signage is permitted in these facilities.

Regardless of whether the lettering is red or green, it must be "on a contrasting background," as is also required in s. COMM 51.15 (5)(a) 3.

Also be aware of licensing requirements from the Life Safety Code for specifications for chevrons, arrows and exit signs.

(2) DIRECTIONAL SIGNS. An illuminated sign, not less than 6 inches high, reading "EXIT" or similar designation, with an arrow indicating the direction, shall be placed in every location where the direction of travel to reach the nearest exit is not immediately apparent.

(3) OBSTRUCTIONS.

(a) Decorations, furnishings or equipment which impair visibility of an exit sign shall not be permitted. Displays, objects in or near the line of vision to the required exit sign or brightly illuminated signs used for purposes other than exits shall not be permitted so as to detract attention from the exit sign.

(b) Hangings or draperies shall not be placed over exit doors or be located as to conceal or obscure any exit. Mirrors shall not be placed on exit doors. Mirrors shall not be placed in or adjacent to any exit in such a manner as to confuse the direction of exit.

(4) SPECIAL SIGNS. Any door, passage, or stairway which is neither an exit nor a way of exit access, and which is located or arranged that it may be mistaken for an exit, shall be identified by a sign indicating it is not an exit.

COMM 58.19 HEADROOM.

Every means of egress shall be provided with a ceiling clearance of not less than 7 feet 6 inches.

COMM 58.20 KEY LOCKING HARDWARE.

Key locking hardware on exit doors and exit access doors is prohibited except in areas accommodating residents who must be detained for their protection and the protection of the general public and the building complies with the requirements of ch. COMM 58, subchs. I and II. Where the requirements of the 2 subchapters differ, the additional or more stringent requirement shall govern.

Question: *Section 58.20 appears to be quite a bit more restrictive than 51.15 (3)(c) when concerning the securing of exits in hospitals and nursing homes. Which requirement do we use?*

Answer: *The exception (to allow the securing of exits) in 51.15 has been in place in one form or another since 1973, long before the creation of Chapter 58. The exception and notes in 51.15 were intended to provide the guidelines for allowing the securing of exits as well as to identify the need for a written approval by the department. The notes also attempted to cross reference several of the requirements of the licensing agency when hospitals and nursing homes are involved.*

The differences within the rules of the Dept. of Commerce and DH&FS created the need for a separate code (CH. 58) which went into effect in 1982. That occupancy chapter included the most current requirements related to health care and detention facilities, including all requirements related to buildings which will have secured exits.

Therefore, the provisions of 51.15 (3)(c) will apply to all jails, hospitals and nursing homes constructed prior to January 1, 1982. Facilities constructed on or after January 1, 1982, are required to meet the needs outlined in s. COMM 58.20.

An alternative to keylocking is the time-delayed exit option of COMM 51.15(3)(f) and Life Safety Code section 5-2.1.6.

Part 4 —Protection

COMM 58.21 PROTECTION OF OPENINGS.

(1) DOORS. Doors protecting openings in occupancy separations, smoke barriers, or horizontal exits shall be fire-resistive door assemblies as specified in s. COMM 51.047.

(2) CLOSING DEVICE. Doors protecting such openings shall be equipped with a closing device and shall normally be kept closed, except the doors may be held open by a hold open device actuated by products of combustion other than heat. The closing device shall be arranged such that the activation of any one or all of the following systems will initiate the self-closing action of all such doors:

(a) Manual fire alarm system;

(b) Automatic smoke detection system or a local device designed to detect smoke on either side of the opening; and

(c) Automatic sprinkler system or fire detection system, if provided.

COMM 58.22 ELEVATOR LOBBY ENCLOSURES.

(1) GENERAL. All elevator lobbies shall be enclosed with at least one-hour fire-resistive construction as specified in s. COMM 51.04, to limit the spread of smoke and fire. All openings shall be protected with fire-resistive door assemblies as specified in s. COMM 58.21.

This separation is intended to smoke separate the lobby of an elevator from the exit access corridor. We will permit the use of 20-minute labeled fire door assemblies, the same as allowed for other smoke barrier opening protection.

(2) OPENINGS IN THE ENCLOSURE. Openings in the elevator lobby enclosure shall be limited to exit access doors serving public passageways or corridors and openings into elevator shaft enclosures. The elevator lobby shall not be used as a portion of the exit access passageway.

COMM 58.23 PROTECTION OF VERTICAL OPENINGS.

(1) INTERIOR SHAFTS. Every elevator shaft, dumbwaiter shaft, pipe shaft and other similar vertical shaft in buildings, shall be enclosed as specified in Table 51.03-A, except as provided in pars. (a) and (b):

(a) One-hour rated enclosures are permitted in hospitals of type 3 construction; or

(b) Duct penetrations of floor assemblies which are protected as specified in NFPA 90A.

(2) ESCALATORS. All escalators shall be enclosed as specified in s. COMM 58.06 (2).

COMM 58.24 PROTECTION FROM HAZARDS.

See COMM 54.14 commentary.

(1) SEPARATIONS. All hazards listed in Table 58.24 shall be vertically separated from other areas of the building with fire-resistive rated construction as specified in Table 58.24. All openings shall be protected with fire-resistive door assemblies as specified in s. COMM 51.047.

TABLE 58.24

HAZARDS	FIRE-RESISTIVE RATING IN HOURS
† Soiled Linen Rooms	1
Kitchens[1]	1
Handicraft Shops[1]	1
† Carpenter Shops	1
Repair Shops[1]	1
† Paint Shops	1
† Trash Collection Rooms	1
† Storage Rooms (containing quantities of flammable or combustible material exceeding 1 lb. of material per square foot of floor area)	1
Gift Shops[1]	1
† Laboratories (containing quantities of flammable or combustible material exceeding 1 lb. of material per square foot of floor area)	1
All other laboratories[1]	1
Employe Locker Rooms[1]	1

† These areas are required to be protected with an automatic sprinkler system in addition to the fire-resistive enclosure requirements specified in the table.

[1] The minimum hourly ratings specified may be reduced to a smoke separation with a self-closing door in buildings protected by a complete automatic sprinkler system.

(2) FIREPLACES. Fireplaces shall be permitted in health care facilities provided:

(a) The fireplace is installed and used in areas other than patient sleeping areas which are separated from the patient sleeping areas by construction having at least a one-hour fire-resistive rating;

(b) The fireplace is equipped with safety screens and a heat tempered glass fireplace enclosure capable of withstanding temperatures of 650°F.; and

(c) Combustion air for the fireplace is taken directly from outside the building.

COMM 58.25 RUBBISH CHUTES AND LAUNDRY CHUTES.

(1) VERTICAL PROTECTION. Any rubbish chute or laundry chute shall be enclosed with walls or partitions of at least 2-hour fire-resistive construction specified in s. COMM 51.043, except that horizontal portions of pneumatic rubbish and laundry chute systems need not be enclosed. All openings shall be protected with fire-resistive door assemblies as specified in ss. COMM 51.047 and 58.21 (2), and shall include the opening from the chute into the collection room.

(a) All rubbish chutes may discharge into trash collecting rooms, which are used for no other purpose and are enclosed as specified in Table 58.24. The incinerator shall not be directly flue-fed nor shall any floor discharging chute directly connect with the combustion chamber.

(b) All laundry chutes shall discharge into laundry rooms or laundry collecting rooms, which are used for no other purpose and are enclosed as specified in Tables 51.08-2 and 58.24.

(2) SPRINKLER PROTECTION. All rubbish chutes or laundry chutes, including pneumatic rubbish and laundry systems, shall be provided with automatic sprinkler protection specified in s. COMM 51.23.

(3) FIRE DAMPERS. Fire dampers are required where chutes penetrate 2-hour or better fire-rated floor or wall systems in a horizontal run.

COMM 58.26 INTERIOR FINISH.

(1) SCOPE. The requirements of this section apply to the interior finishes and surfaces of a building.

Note: See s. COMM 51.06 for specific requirements pertaining to foam plastics.

(2) WALLS AND CEILINGS.

(a) *Materials.* Except as provided in par. (b), all walls and ceilings shall be Class A as specified in s. COMM 51.01 (75a).

Note: See ch. COMM 4 for interior finish for elevator cabs.

(b) *Exceptions.*

1. Walls and ceilings of individual rooms having a capacity of not more than 4 persons may have a Class B interior finish as specified in s. COMM 51.01 (75a).

2. Interior finish not in excess of 10% of the aggregate wall and ceiling areas of any room or space may be Class C materials in occupancies where interior finish of Class A or Class B is required.

(c) *Napped, tufted and looped materials.* Materials such as carpeting having a napped, tufted, looped, or similar surface, when applied on walls or ceilings, shall meet the requirements of Class A interior finish.

(3) FLOORS. All interior finishes of floor materials shall be Class I or better as specified in s. COMM 51.01 (75a).

(a) *Tongue and groove wood flooring.* Tongue and groove wood flooring, 1/2 inch thick or greater, shall be permitted.

(b) *Floor material.* Floor material such as carpeting, shall be fire tested with the underlayment used and shall comply with the requirements as specified in ASTM E648-78, Test for Criteria Radiant Flux of Floor Covering Systems Using a Radiant Heat Source.

(4) FIRE-RETARDANT PAINTS OR SOLUTIONS. Fire retardant paints or surface applied solutions shall not be used to satisfy the requirements of this section.

COMM 58.27 DETECTION, ALARM AND COMMUNICATION SYSTEMS.

(1) GENERAL. All required detection and signaling devices and systems shall comply with the requirements of this section.

(a) All such systems shall be tested at least once a week and a record of such t shall be kept. All system components or equipment shall be restored to normal condition promptly after each test or alarm and shall be maintained in an operable condition.

(b) The system shall be so arranged that the operation of any one station will actuate all devices connected to the system.

(c) A signaling system may be arranged to automatically perform local, incidental control functions to make the premises safer in the event of fire or to make it possible to hear alarm signals. The performance of incidental control functions, such as the release of self-opening or self-closing doors, shutting off supplies of gas, fuel oil, or electrical power, switching on emergency lights, switching off air supply ventilating fans, and other similar functions, shall not in any way impair the effective response of all required alarm indicating devices. The performance of incidental control functions shall not interfere with the power for lighting or for operating elevators.

The provisions in this subsection allow for "state of the art" multifunction control systems to be used provided the detection, alarm, and communication system are not impaired by the other functions.

(2) FIRE ALARMS. Every building shall have a manually operated fire alarm system as specified in s. COMM 51.24 and shall comply with the following requirements:

(a) The operation of any fire alarm activating device shall automatically, without delay, accomplish general alarm indication and control functions as specified in sub. (1). Zoned, coded systems may be used.

(b) The fire alarm system shall be arranged to transmit an alarm automatically to the fire department required to serve the area in which the health care facility is located, by the most direct and reliable method approved by local regulations.

(3) AUTOMATIC SMOKE DETECTION SYSTEM.

(a) Except as provided in par. (b), an approved automatic smoke detection system shall be installed in all corridors in nursing homes. Such systems shall be installed and maintained as specified in NFPA 72 but in no case shall smoke detectors be spaced more than 30 feet apart on center or more than 15 feet from any wall. All automatic smoke detection systems required by this section shall be electrically interconnected to the fire alarm system.

(b) Corridor smoke detection systems are not required on the patient sleeping room floors, where each patient sleeping room is protected by an approved smoke detection system.

(4) FIRE EXTINGUISHERS. Portable fire extinguishers shall be provided and maintained as specified in s. COMM 51.22.

COMM 58.28 STANDPIPES.

(1) FIRST-AID STANDPIPES. First-aid standpipes shall be provided as specified in s. COMM 51.21 for all health care facilities, unless an approved automatic sprinkler system is installed.

(2) FIRE DEPARTMENT STANDPIPES. Fire department standpipes shall be provided in all buildings exceeding 60 feet in height and shall comply with the requirements specified in s. COMM 51.21.

COMM 58.29 AUTOMATIC SPRINKLER AND OTHER SUPPRESSION SYSTEMS.

Automatic sprinkler systems shall comply with the requirements specified in s. COMM 51.23, except as modified in this section.

(1) WHERE REQUIRED.

(a) *Hospitals.* Automatic sprinkler systems shall be provided as specified in ss. COMM 52.01 and 58.24.

Section COMM 52.01 refers to the high-rise requirements and s. COMM 58.24 refers to hazard isolation requirements. Partial automatic sprinkler protection is also required as outlined in s. COMM 58.25. Complete automatic sprinkler protection is also required for those facilities proposing to use increases in exit distance and exit capacity.

For licensing purposes per Life Safety Code section 12-3.5, complete automatic sprinkler protection is required for newly-licensed facilities and for changes in occupancy to a hospital.

(b) *Nursing homes.*

1. A complete automatic fire sprinkler system shall be provided in all nursing homes constructed after the effective date of this rule.

2. Additions to existing nursing homes shall be provided with a complete automatfire sprinkler system. The sprinkler protection shall be provided throughout unless the addition is separated from the existing building by at least 2-hour fire-resistive construction in which case only the addition shall be protected by an automatic fire sprinkler system. The intent of this section is to provide a 2-hour fire wall similar to that outlined in s. COMM 52.011 (5). (Also see s. COMM 51.02 (20).)

The use of a 2-hour fire wall will also be permitted to subdivide hospitals into sprinklered and unsprinklered portions for building code compliance and credits.

For licensing purposes, hospitals may only require a 1-hour smoke barrier separation between sprinkler and unsprinklerd areas.

(2) SPRINKLER CONTROL VALVES.

(a) The main sprinkler control valves shall be electrically supervised so that at least a local alarm will sound at a constantly supervised location when the valve is closed.

(b) All valves other than the main sprinkler control valve shall be electrically supervised or secured with a key locking device.

(3) WATER FLOW SWITCH. The water flow alarm switch for the automatic sprinkler system shall be electrically interconnected with the fire alarm system.

(4) PARTIAL AUTOMATIC SPRINKLER SYSTEM. The sprinkler piping serving no more than 6 sprinklers for any isolated hazardous area, may be connected directly to a domestic water supply system having a capacity sufficient to provide 0.15 gallons per minute per square foot of floor area throughout the entire enclosed area.

(a) *Indicating shut-off valve.* An indicating shut-off valve shall be installed in an accessible location between the sprinklers and the connection to the domestic water supply.

(b) *Water flow detection.* Where more than 2 sprinklers are installed in a single area, water flow detection shall be provided to sound the building fire alarm system in the event of sprinkler operation.

(5) OTHER AUTOMATIC SUPPRESSION SYSTEMS.

(a) *Types.* Other automatic suppression systems such as, but not limited to, carbon dioxide, dry chemical, foam and Halon 1301, may be installed in lieu of an automatic water sprinkler system in any occupancy where the extinguishment or control of fire may be more effectively accomplished by this type of automatic suppression system.

(b) *Activation.* These suppression systems shall be installed such that the fire alarm system will sound when the suppression system is activated.

COMM 58.30 SMOKE BARRIER.

(1) DEFINITION. A smoke barrier is a separation wall which is continuous from outside wall to outside wall and from floor slab to the underside of the floor slab or roof slab above, including all concealed spaces such as those found above a ceiling including interstitial spaces.

(2) FIRE-RESISTIVE RATING. Smoke barriers shall have a one-hour fire-resistive rating specified in s. COMM 51.043.

(3) WHERE REQUIRED. Smoke barriers are required to:

(a) Limit the area on any story to a length and width of not more than 150 feet;

(b) Divide every story into at least 2 compartments; and

(c) Enclose elevator lobbies on each floor.

(4) DOORS.

(a) Corridor openings in smoke barriers shall be protected by a pair of swinging doors, each door to swing in a direction opposite from the other. Each door shall have a minimum width of 44 inches, except corridor openings in areas not intended for the housing, treatment, or use of patients may be protected by a single door having a minimum width of 36 inches.

The provisions for double doors are intended to deal with those conditions where the smoke barrier "crosses" the exit access corridor.

(b) Doors in smoke barriers shall be self-closing and have at least a 20-minute fire-resistive rating, except doors may be held open as specified in s. COMM 58.21.

(c) Door louvers and grills are prohibited. Doors may be undercut to a maximum of 3/4 inches.

(d) A vision panel complying with the requirements of s. COMM 51.048 and not exceeding 1,296 square inches in area, shall be provided in each door in a smoke barrier and shall be set in steel frames. The bottom of the vision panel shall be located not more than 40 inches off the floor.

Due to the technological advances in the products/materials used in the manufacture of fire window assemblies, the department will considered a larger size glazing panel provided it has been tested and listed as a part of the fire door assembly. Windows/lights in doors must be ***provided at the factory*** *and must be included in the "labeled assembly." Field modification to fire door assemblies is not allowed (see s. COMM 51.047 (2)(a)).*

(e) Rabbets, bevels, or astragals are required at the meeting edges, and stops are required on the head and sides of door frames. Positive latching hardware is not required.

58.30 (4)(e) The lack of positive latching hardware, as permitted by this section, creates a problem for many door manufacturers who are unable to provide a label on their fire doors when proper hardware (latching) is not going to be installed. When "labeled" doors cannot be obtained for these instances, the department may accept the unlabeled door provided the following procedure and criteria are met:

1. Literature from the testing laboratory must be made available at the job site which identifies the manufacturer and door type (model number, etc.) that has been tested and what fire rating has been assigned.

2. Each door must bear a construction label or identification markings (labels or stamps) which clearly identify the door type (model number, etc.) and manufacturer as reflected by the literature referenced in 1. above.

(f) Center mullions are prohibited.

This prohibition applies to pairs of doors in the smoke barrier which cross the exit access corridor as outlined in the comments under s. COMM 58.30 (4)(a).

(5) DAMPERS. An approved damper designed to resist the passage of smoke shall be provided at each point a duct penetrates a smoke barrier. The damper shall close upon detection of smoke by an approved smoke detector, located within the duct except that:

(a) The approved damper, if located above a smoke barrier door, may be arranged to close upon detection of smoke by the local device designed to detect smoke on either side of the smoke barrier door opening.

(b) Buildings designed with an engineered smoke control system as specified in NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems, need not comply with this requirement.

(6) VISION PANELS.

(a) Except as provided in par. (b), fixed wire glass vision panels shall be permitted in smoke barrier walls, provided the vision panels do not exceed 1,296 square inches in area. The vision panels shall have bolted steel frames and the glazing material shall be listed by an approved testing laboratory.

(b) Vision panels shall not be restricted in area and in fire resistance of glass or frames in buildings equipped throughout with an approved automatic extinguishing system.

Be aware that the exception to not provide a labeled fire window assembly is not in existence in the Life-Safety Code and does not recognize the deletion or downgrading of a smoke barrier as is allowed for the construction of corridor walls. The licensing agency may not allow increases in size or deletion of the labeling requirement.

COMM 58.31 CONSTRUCTION OF CORRIDOR WALLS.

(1) FIRE-RESISTIVE RATING. Except as otherwise provided in this section, corridors shall be separated from all other areas by partitions which are continuous from the floor slab to the underside of the roof or floor slab above, through any concealed spaces such as those above suspended ceilings, and through interstitial structural and mechanical spaces, and shall have at least a one-hour fire-resistive rating as specified in s. COMM 51.043.

(a) In health care facilities equipped throughout with an approved automatic extinguishing system, a corridor may be separated from all other areas by nonfire-rated partitions, and where suspended ceilings are provided, the partitions may be terminated at the suspended ceiling.

Even though the fire-resistive rating is dropped, the intent is to still provide a partition which is constructed in a manner to normally resist the passage of smoke. It is further intended that a "suspended ceiling," used to terminate walls is a "solid" type, not the "egg crate style" which is on the marketplace.

(b) Corridor partitions may terminate at ceilings which are not an integral part of a floor construction if there is at least 5 feet of space between the top of the ceiling subsystem and the bottom of the floor or roof above provided:

1. The ceiling is of membrane type with a finish rating of 15 minutes;
2. Corridor partitions form smoke-tight joints with the ceilings (joint filler, if used, must be noncombustible);
3. Each compartment of interstitial space which constitutes a separate smoke area is vented, in case of smoke emergency, to the outside by mechanical means having a capacity to provide at least 2 air changes per hour, but in no case having a capacity less than 5,000 cfm;
4. The interstitial space shall not be used for storage; and
5. The space shall not be used as a plenum for supply, exhaust or return air except as provided in subd. 3.

(c) Waiting areas on a patient sleeping floor may be open to the corridor, provided:

1. The area does not exceed 250 square feet;
2. The area is located to permit direct supervision by the facility staff;

The direct supervision refers to a space which is visible from a normally staffed area such as a nursing station or a satellite staffed station.

3. The area is equipped with an electrically supervised automatic smoke detection system installed as specified in s. COMM 58.27; and
4. Not more than one such waiting area is permitted in each smoke compartment.

(d) Waiting areas on floors other than institutional sleeping floor may be open to the corridor, provided:

1. Each area does not exceed 600 square feet;
2. The area is located to permit direct supervision by the facility staff;

The direct supervision refers to a space which is visible from a normally staffed area such as a nursing station or a satellite staffed station.

3. The area is arranged not to obstruct any access to required exits;

4. The area is equipped with an electrically supervised, automatic smoke detection system installed as specified in s. COMM 58.27.

(e) Buildings equipped throughout with an approved automatic sprinkler system may have spaces open to the corridor which are unlimited in size provided:

1. The spaces are not used for patient sleeping rooms, treatment rooms or hazardous areas;

2. Each space is located to permit direct supervision by the facility staff;

The direct supervision refers to a space which is visible from a normally staffed area such as a nursing station or a satellite staffed station.

3. The space and corridors which the space opens onto in the same smoke compartment are protected by an electrically supervised automatic smoke detection system installed as specified in s. COMM 58.27; and

4. The space is arranged not to obstruct access to required exits.

(f) Space for doctors' and nurses' charting, communications, and related clerical areas may be open to the corridor.

(2) VISION PANELS.

(a) Fixed wire glass vision panels shall be permitted in corridor walls provided they do not exceed 1,296 square inches in area and comply with the requirements specified in s. COMM 51.048.

(b) Vision panels shall not be restricted in area and in fire resistance of glass or frames in buildings equipped throughout with an approved automatic extinguishing system.

(3) DOORS. Except as otherwise provided in this subsection, doors protecting corridor openings, other than required enclosures of exits or hazardous areas, shall have a 20-minute fire-resistive rating and be provided with latches. Fixed wire glass vision panels installed in these doors shall not exceed 720 square inches in area and shall be mounted in approved steel frames.

(a) In buildings equipped with a complete approved automatic sprinkler system:

1. Such doors and frames are not required to have a fire-resistive rating, but shall be constructed to resist the passage of smoke;

2. Such doors are provided with latches of a type suitable for keeping the door tightly closed; and

3. There is no restriction on the area of vision panels in these doors, the vision panels do not need to be wired, and there is no restriction in the type of frames.

(b) Door closing devices are not required on doors in corridor wall openings, other than those exits or required enclosures of hazardous areas.

(c) Labeled door frames are not required on openings other than those serving exits or required enclosures of hazardous areas, providing the door frames and stops are of steel construction.

(d) Doors to toilet rooms, bathrooms, shower rooms, sink closets, and similar auxiliary spaces which do not contain flammable or combustible materials need not comply with this section.

(4) TRANSFER GRILLS. Transfer grills shall not be used in these walls or doors, except doors to toilet rooms, bathrooms, shower rooms, sink closets and similar auxiliary spaces which

do not contain hazardous quantities of flammable or combustible materials may have ventilating louvers or may be undercut.

Part 5 —Sanitary Facilities

COMM 58.32 SANITARY FACILITIES.

(1) TOILET ROOMS. Every building included under the scope of this subchapter shall be provided with separate toilet rooms for each sex, and shall comply with the requirements specified in this section and

(a) ss. COMM 52.50 (2)(b) to 52.62; and

(b) ss. COMM 52.04 (4) and (8), 52.041 and 52.042.

A fabric privacy curtain may be used to separate the patient area from the toilet area in an ICU/CCU unit provided the curtain meets the flame spread, density, and washability requirements of DHFS. Remember, the toilet area must meet exhaust requirements. Also check the size-of-opening requirements for cubicle curtains in sprinklered facilities to eliminate obstructions to sprinkler discharge.

(2) SANITARY FIXTURES.

(a) *Patients.* The number of fixtures required for each sex shall comply with the ratios specified in Table 58.32.

(b) *Employes.* The number of fixtures for employes shall comply with the requirements specified in Table 54.12-B and s. COMM 52.04 (4) and (8).

(c) *General public.* The number of fixtures for the general public shall comply with the requirements specified in Table 54.12-A and s. COMM 52.04 (4) and (8).

Note: See ch. HSS 124--Hospitals, and ch. HSS 132--Nursing Homes, for special requirements and locations for water closets, lavatories and bathing facilities.

TABLE 58.32

NUMBER OF SANITARY FIXTURES REQUIRED FOR RESIDENTS OF HEALTH CARE FACILITIES[1,2]

Type of Occupancy	Type of Fixture			
	Water Closets (WC)	Lavatories (L)	Bathtubs or Showers	Drinking Facilities (DF)
Nursing Homes	One (WC) per every 2 patient rooms and not more than 4 beds	One (L) per every 2 patient rooms and not more than 4 persons per each (L)	One per each 20 patients or fraction	One (DF) for each 100 persons
Hospitals	One (WC) per every 2 patient rooms and not more than 4 beds	One (L) per every 2 patient rooms and not more than 4 persons per each (L)	One per each 15 patients or fraction	One (DF) for each 100 persons

[1] For structures with additions or alterations, the required number of sanitary fixtures shall be the sum of the fixtures required for the existing portion at the time it was constructed plus the the fixtures required by this table for the new addition or altered area. At such time as the summation of the addition and alteration area is equal to or greater than 51% of the building area calculated as specified in s. COMM 50.03 (4) (d), fixtures shall be provided in conformance to this table utilizing the capacity of the entire building.

[2] Where a single toilet room designated as UNISEX is provided, it shall be considered as accommodating no more than 10 employes and 25 occupants.

Subchapter II — Detention and Correctional Facilities

Part 1 — Scope

COMM 58.40 SCOPE.

The requirements of this subchapter shall apply to all detention and correctional facilities, constructed on or after the effective date of this subchapter.

A minimum security/work release/Huber facility which does not employ the use of locking hardware on any doors required for egress need not be designed as a detention facility under the scope of Chapter 58, subsection II. See 58.41 (3), Chapter 57, and the commentary on s. COMM 57.01.

COMM 58.41 DEFINITIONS.

For the purpose of this subchapter, the following terms are defined:

(1) "Borrowed light" means an opening in an interior partition which provides natural light to an interior space.

(2) "Dayroom" means any room used as a group activity space and located contiguous to the sleeping rooms.

(3) "Detention and correctional facilities" means any building or part of a building used for purposes such as jails, detention centers, correctional institutions, reformatories, houses of correction, prerelease centers, and other residential care facilities where occupants are forcibly confined.

*Prerelease centers, Huber facilities, and other similar facilities where the exits are **not** secured in any manner which would delay or prevent egress may be reviewed under the scope of that occupancy which would best apply, rather than chapter 58, Subchapter II. Due to the inherent problems that can be created as "minds are changed" over the years, it is recommended that the owner submit a letter for our file prior to the approval of such a facility outside of the requirements outlined in Subchapter II of Chapter COMM 58. The letter should clearly outline their understanding that the limitations do not allow the securing of exits*

(4) "Holding room" means any room used for confining persons for a maximum of 72 hours for the purpose of booking, court appearances and similar type functions.

(5) "Program support facility" means any detention or correctional facility, other than sleeping areas, containing only those facilities such as schools, theaters, assembly halls, shops, gyms, offices, medical facilities, food service and dining facilities, laundries, gatehouses and other similar facilities, where the occupancy of these areas is primarily residents or detention staff or both.

(6) "Smoke barrier" means a separation wall which extends continuously from outside wall to outside wall and from the floor to the underside of the floor slab or roof slab above, including all concealed spaces such as those found above a ceiling including interstitial spaces.

(7) "Smoke compartment" means a space within a building enclosed by smoke barriers on all sides.

(8) "Security vestibule" means a compartment provided with 2 or more doors with the intended purpose to prevent the continuous and unlimited passage by allowing the release of only one door at a time.

Part 2 — General Requirements

COMM 58.42 CLASS OF CONSTRUCTION.

(1) BUILDINGS OR PORTIONS OF BUILDINGS WITH SLEEPING ROOMS. All detention and correctional facilities containing sleeping facilities or holding rooms or both shall be at least type 2 construction as specified in s. COMM 51.03.

(2) PROGRAM SUPPORT FACILITIES. All program support facilities shall be constructed in accordance with the following:

(a) *One-story building.* All buildings one-story in height shall be at least type 6, totally noncombustible construction as specified in s. COMM 51.03.

(b) *Two stories or more in height.* All buildings 2 stories or more in height shall be at least type 2 construction as specified in s. COMM 51.03.

COMM 58.43 PROGRAM SUPPORT FACILITIES.

All program support facilities shall comply with the specific occupancy chapter requirements as specified in chs. COMM 54 to 62, except as modified in ss. COMM 58.59 and 58.64.

COMM 58.44 SEPARATION FROM OTHER OCCUPANCIES AND HAZARD ENCLOSURES.

(1) OCCUPANCY SEPARATION. Occupancies not within the scope of this subchapter, built in connection with any detention or correctional facility shall be separated from any such detention or correctional in accordance with s. COMM 51.08. Auditoriums, chapels, dining rooms, residential facilities and other similar areas provided for the residents need not be separated with rated construction. Class of construction separations shall comply with s. COMM 51.02 (20).

(2) GARAGES.

(a) Storage garages and repair garages shall be separated from detention and correctional facilities as specified in s. COMM 59.22.

It should be noted that s. COMM 59.22 refers directly to s. COMM 51.08. For ease in research, one could eliminate the intermediate step of looking up s. COMM 59.22 by going to s. COMM 51.08 directly.

(b) Areas accommodating vehicles for the purpose of loading or unloading persons or material need not be separated from detention and correctional facilities. Storage or repair of the vehicles is prohibited in the loading and unloading areas, unless the type of construction meets the requirements for a garage.

(3) HAZARD ENCLOSURES. Hazards shall be enclosed in accordance with s. COMM 51.08.

(4) EXITING FROM MIXED OCCUPANCIES. Required means of egress from all detention and correctional occupancies may exit through nondetention and noncorrectional occupancies provided the means of egress complies with the requirements specified in this subchapter.

The "egress" being referred to in this subsection does not intend that other occupancies are to have exit hardware which can be secured or locked other than as outlined under s. COMM 51.15 (3).

COMM 58.45 WINDOWS.

(1) NATURAL LIGHTING. Every sleeping room, except holding rooms where residents are detained for a time period not to exceed 72 hours, shall be provided with natural light. The

natural light may be provided directly to the sleeping room by windows or sky lights or may be transferred indirectly to the space through the use of borrowed lights. The natural light shall be provided through either clear or translucent glazing with the area of the sash being at least 8% of the floor area served.

(2) VENTILATION. Every sleeping room shall be provided with ventilation in accordance with one of the following:

(a) Windows or skylights with an openable area not less than 4% of the floor area served and located within the sleeping room; or

(b) Mechanical ventilation as specified in s. COMM 64.58 (2) and provided with an emergency source of power.

COMM 58.46 SIZE OF SLEEPING ROOMS.

Every sleeping room shall provide at least 400 cubic feet of space for each occupant. In places of detention, day rooms may be used to satisfy the 400-cubic-foot-per-person volume requirement provided the following criteria are met:

(1) The shared day room space shall be immediately adjacent to the sleeping room and the combined volume of the day room and the sleeping room shall be a minimum of 400 cubic feet per occupant; and

(2) Ventilation shall be provided by one of the following methods:

(a) Natural ventilation shall be based on the ratio of 2 square feet per person of openable windows or skylights. The natural ventilation may be drawn from any openable windows or skylights located accessible to the sleeping room. A minimum of 50 percent of the vertical plane separating the sleeping room from the day room shall be open, such as may be provided with bars or security grilles.

(b) Mechanical ventilation shall be provided in accord with COMM 58.45 (2) (b) if a minimum of 50 percent of the vertical plane separating the sleeping room from the day room is not open. The sleeping room shall have a minimum of 35 square feet of floor area per person. The floor area shall include all area within the walls of the sleeping room, including the space taken up by beds, lavatories, water closets and furniture.

Note 1: Section DOC 350.05 requires a ceiling height of at least 8 feet in sleeping rooms, and a floor area of at least 54 square feet in single occupancy cells.

Note 2: Section DOC 350.07 requires the floor area in double occupancy cells to be at least 70 square feet for jails constructed or substantially remodeled on or after March 1, 1990, and at least 54 square feet for jails constructed before March 1, 1990.

Since July 1, 1991, the department can consider approving smaller sleeping rooms when the additional volume of space to make up the deficit is available in a common area (such as the dayroom) immediately adjacent to the sleeping room. The square footage provisions outlined in the interpretation are intended to deal with the conversion of a single person cell to a double occupant cell. We will also consider allowing 35 square feet per person in dormitory type sleeping rooms. In all cases, a request for approval must be submitted to the department and approval must be obtained prior to increasing the occupant load.

Question: *Are plans required to be submitted whenever double-celling of inmates is required?*

Answer: *Not necessarily. COMM 50.03 (3) requires that plans be submitted if alterations affecting the exits, natural light, fire hazard or structural strength are made to the structure. If the increased occupant number does not require physical alteration to the facilities, plan submittals are not*

required. Owners and designers must be aware that approval from the department must be obtained prior to increasing the occupant load by using the provisions of the interpretations.

The Dept. of Commerce offers preliminary design review to assist facility managers in determining whether the increased occupant number will require alterations to take place.

Question: *Can the volume of the dayroom space be used to satisfy the 400 cubic feet per person volume required for sleeping rooms?*

Answer: *Yes, provided all of the following criteria are met:*

1. The shared dayroom space is immediately adjacent to the sleeping room and the combined volume of the day room and the sleeping room is a minimum of 400 cubic feet of volume per occupant.

2. The floor area of the sleeping room shall not be less than 70 square feet for jails constructed or substantially remodeled on or after March 1, 1990, or 54 square feet for jails constructed before March 1, 1990, as required by DOC 350.07. The floor area includes all area within the walls of the sleeping room, including the space taken up by the beds, lavatories, water closets, furniture, etc. 3. Ventilation shall be provided by one of the following methods:

a. Natural ventilation based on the ratio of 2 square feet per person of openable windows or skylights shall be provided. The natural ventilation may be drawn from any openable windows or skylights located accessible to the sleeping room. A minimum of 50 percent of the vertical plane separating the sleeping room from the dayroom shall be open (i.e., bars, security grille).

OR

b. Mechanical ventilation as per COMM 58.45 (2)(b) shall be provided if a minimum of 50 percent of the vertical plane separating the sleeping room from the day room is not open. The sleeping room shall have a minimum ceiling height of 8 feet and shall have a minimum of 35 square feet of floor area per person. The floor area includes all area within the walls of the sleeping room, including the space taken up by beds, lavatories, water closets, furniture, etc.

COMM 58.47 SLEEPING ROOMS BELOW GRADE.

All buildings having sleeping rooms below grade shall be designed and constructed to prevent penetration or collection of moisture within occupied spaces.

Part 3 —Means of Egress Requirements

COMM 58.48 REQUIRED MEANS OF EGRESS.

(1) GENERAL REQUIREMENTS. All required means of egress doors shall comply with s. COMM 51.15, except as modified in this section and s. COMM 58.59.

See COMM 54.02 (5) commentary.

(2) DOORS IN MEANS OF EGRESS.

(a) Doors in a means of egress may be of the horizontal sliding type, providing the force to slide the door to its fully open position does not exceed 37 pounds.

(b) A door which serves an area with a capacity not more than 25 persons is not required to open in the direction of egress.

(3) EXIT DISCHARGE. Exit discharge may terminate at one of the following:

(a) Directly at the exterior of the building;

(b) At a horizontal exit; or

(c) Into a fenced or walled court, provided that not more than 2 walls of the court are the walls of the building from which exit is being made. Enclosed yards or courts shall be sized to accommodate all occupants, a minimum of 30 feet from the building with a net area of 15 square feet per person. Access from the fenced or walled court to the public thoroughfare may be fenced and locked.

(4) EXIT ACCESS. A dayroom may serve as a portion of the exit access from a sleeping room.

This simple statement has created a lot of confusion in the past. If a day room is to be used as a part of the exit access corridor system, the day room is also subject to the limits associated with an exit access corridor. This includes but is not limited to the 30-foot dead end limitation outlined in s. COMM 58.55 (6) and the total distance along an exit access corridor as outlined in s. COMM 58.56 (1).

COMM 58.49 EXIT DOORS, NUMBER AND TYPE OF EXITS.

(1) NUMBER. At least 2 exits shall be accessible from each floor of the building and shall be located such that in case any exit is blocked, some other exit will still be accessible.

(2) EXIT DOORS. All exit doors shall be at least 36 inches in width.

(3) EXIT ACCESS DOORS. All exit access doors shall be at least 36 inches in width, except for the following modifications:

(a) Doors to sleeping rooms shall be at least 28 inches in width;

(b) Doors to sleeping rooms designated for use by the physically disabled shall be at least 32 inches in width; or

(c) Doors to dayrooms shall be at least 32 inches in width.

(4) TYPE OF EXITS.

(a) Required exits shall be by a door leading directly to a stairway, smokeproof tower, ramp, horizontal exit, exit passageway or outside the building as specified in this subchapter. No more than one-half of the required exits may be horizontal exits.

(b) Where a detention or correctional facility, other than a hospital or nursing home, is located on the upper floors of a building having a different occupancy, at least one of the exits from the detention or correctional facility shall be a separate smokeproof tower as specified in s. COMM 51.17. The smokeproof tower shall serve only the detention or correctional facility and there shall be no doors opening into the smokeproof tower from any other occupancy of the building.

COMM 58.50 STAIRWAYS.

(1) GENERAL.

(a) All required exit stairways shall comply with the requirements specified in s. COMM 51.16 and shall be enclosed as specified in s. COMM 51.18.

Be aware that stairs used for egress inside of a multi-tier open cell arrangement need not be enclosed even if the floor area of the "tiers" creates another story. For the reference to this exception as well as other restrictions related to such open cell arrangements, see s. COMM 58.61 (2) in its entirety.

(b) 1. Except as provided in subd. 2., stairways in addition to those required by this chapter need not lead to the outside but shall be enclosed as required in par. (a).

2. Nonrequired stairways serving open mezzanines need not be enclosed.

(2) STAIRWAY TERMINATION. Stairways provided in addition to those required by this subchapter shall be enclosed as specified in s. COMM 51.18 but need not lead to the outside. A sign or label shall be posted on the doors of the stair enclosures and shall bear the following: "Not an Exit."

The intent of the requirement to enclose per s. COMM 51.18 is that the rated walls of the enclosure be provided at all floor levels. It should also be noted that stairway's traversing different levels of the same floor (less than a 3-foot change in elevation) are not required to be enclosed similar to the exception outlined in s. COMM 58.06 (2)(c).

COMM 58.51 SMOKEPROOF TOWERS.

Smokeproof stair towers shall comply with the requirements specified in ss. COMM 51.17 and 58.48.

COMM 58.52 HORIZONTAL EXITS.

(1) GENERAL. Horizontal exits shall comply with the requirements in s. COMM 51.19, except as modified in this section.

(2) AREA. At least 6 net square feet of accessible space per occupant shall be provided on each side of the horizontal exit for the total number of people in the adjoining compartment.

(3) DOORS.

(a) A single door used as a horizontal exit shall serve one direction only, be at least 36 inches wide and swing in the direction of egress.

(b) Horizontal exit doors may be locked as specified in s. COMM 58.59.

(4) RESTRICTIONS. If a horizontal exit is used as a smoke barrier, it shall comply with s. COMM 58.67.

COMM 58.53 RAMPS.

(1) MINIMUM WIDTH.

(a) *Interior ramps.* Interior ramps shall be a minimum of 44 inches wide, of which not more than 4 inches on each side may be occupied by a handrail.

(b) *Exterior ramps.* Exterior ramps shall be a minimum of 48 inches wide, of which not more than 4 inches on each side may be occupied by a handrail.

(2) SLOPE. Ramps shall have a slope of not more than one foot of rise in 8 feet of run, except ramps providing access for the disabled shall comply with s. COMM 52.04 (7).

(3) ENCLOSURE. Ramps used as a required means of egress shall comply with the enclosure requirements for stairways in s. COMM 51.18.

The exceptions similar to those outlined in s. COMM 58.50 will also be permitted for ramps.

(4) LANDINGS AND PLATFORMS.

(a) If a door is provided at the top or bottom or both of a ramp, a landing or platform shall be placed between the door and the ramp regardless of the direction of swing of the door.

(b) Every landing or platform shall be at least as wide as the ramp, measured at right angles to the direction of travel. The length of every landing or platform shall be at least as wide as the ramp, but need not exceed 48 inches.

COMM 58.54 REQUIRED EXIT WIDTH.

(1) OCCUPANT LOAD. The occupant load for which means of egress shall be provided shall be the maximum number of persons occupying that floor, but not less than one person for each 120 sq. ft. gross floor area.

(2) REQUIRED EXIT WIDTH. The required exit width shall comply with s. COMM 51.15 (6).

COMM 58.55 ARRANGEMENT OF MEANS OF EGRESS.

(1) SLEEPING ROOM. Every sleeping room shall have a door leading directly to an exit access, except where an exit door opens directly to the outside from the room at the ground level.

(2) CORRIDOR ACCESS.

(a) Every aisle, corridor and hallway shall provide access to at least 2 exits complying with s. COMM 58.48.

(b) Every aisle, corridor and hallway used for exit access shall be at least 44 inches in clear and unobstructed width.

(3) EXIT PASSAGEWAYS. Every exit passageway shall be at least 44 inches in width.

(4) AREA EXITING. Any room, suite of rooms, space or area accommodating 25 persons or more, shall have at least 2 exit access doors distributed to provide the best possible means of egress from the room.

(5) SECURITY VESTIBULE EXITING. A security vestibule may be permitted in a means of egress where there are provisions for continuous and unobstructed passage through the security vestibule during an emergency exit condition.

(6) DEAD END CORRIDOR. Every exit or exit access shall be so arranged that no corridor, aisle or passageway has a pocket or dead end exceeding 30 feet.

COMM 58.56 MEASUREMENT OF TRAVEL DISTANCE TO EXITS.

All exits in detention and correctional facilities shall be located to provide means of egress remote from one another.

(1) EXIT ACCESS TO AN EXIT. Travel distance shall be measured along passageways. The distance between any room door required as an exit access and an exit shall not exceed 100 feet, except that in buildings protected with a complete automatic sprinkler system the distance shall not exceed 150 feet.

(2) ROOM TO AN EXIT. Travel distance shall be measured along passageways. The distance between any point in a room and an exit shall not exceed 150 feet, except that in buildings protected with a complete automatic sprinkler system the distance shall not exceed 200 feet.

(3) SLEEPING ROOM TO AN EXIT ACCESS. Travel distance shall be measured along passageways. The distance between any point in a sleeping room or suite and an exit access door to that room or suite shall not exceed 50 feet.

COMM 58.57 ILLUMINATION OF MEANS OF EGRESS.

(1) ILLUMINATION. Artificial lighting shall be provided at all exits and for such period of times as required to maintain safe exiting.

(2) ILLUMINATION LEVEL. The floors of means of egress shall be illuminated at all points including angles and intersections of corridors and passageways, stairs, landings of stairs and exit doors to values specified in ch. Ind 19.

COMM 58.575 EMERGENCY LIGHTING.

Emergency lighting complying with the requirements specified in ch. COMM 16 shall be required when 20 or more resident beds are provided.

COMM 58.58 MARKING OF MEANS OF EGRESS.

(1) EXIT SIGNS. Every required exit shall be identified with an internal illuminated, red exit sign bearing the word "EXIT" or "OUT" in plain letters not less than 6 inches high, with the principal strokes of the letter not less than 3/4 inches.

.See commentary under s. COMM 58.18 (1).

(2) DIRECTIONAL SIGNS. An illuminated sign, not less than 6 inches high, reading "EXIT" or similar designation, with an arrow indicating the direction, shall be placed in every location where the direction of travel to reach the nearest exit is not immediately apparent.

(3) OBSTRUCTIONS.

(a) Decorations, furnishings or equipment which impair visibility of an exit sign shall not be permitted. Displays, objects in or near the line of vision to the required exit sign, or brightly illuminated signs used for purposes other than exits shall not be permitted so as to detract attention from the exit sign.

(b) Hangings or draperies shall not be placed over exit doors or be located as to conceal or obscure any exit. Mirrors shall not be placed on exit doors. Mirrors shall not be placed in or adjacent to any exit in such a manner as to confuse the direction of exit.

(4) SPECIAL SIGNS. Any door, passage, or stairway which is neither an exit nor a way of exit access, and which is located or arranged that it may be mistaken for an exit, shall be identified by a sign indicating it is not an exit.

COMM 58.59 DOOR LOCKS.

All doors in detention and correctional facilities having locking devices shall comply with the following requirements:

(1) LOCKING OF MEANS OF EGRESS DOORS. All doors in detention and correctional facilities may be locked in accordance with this section, providing that staff is on duty 24 hours a day.

(a) *Locks at sleeping rooms.*

1. Single sleeping room. A single sleeping room may be key locked.

2. Two or more sleeping rooms. Where 2 or more sleeping rooms within a smoke compartment are locked, a remote locking and unlocking device shall be provided. The remote locking and unlocking device shall be located outside of the sleeping room areas.

(b) *Locks at exterior doors, stairways and horizontal exits.* Doors from the secured areas to the exterior of the building, into stairway enclosures or at horizontal exits may be locked with a key lock. The keys to unlock such doors shall be maintained and available at the facility at all times and the locks shall be operable from the outside.

(2) REMOTE RELEASE. All remote release operated doors shall be provided with a back-up means of operation as follows:

(a) Power-operated sliding doors or power operated locks shall be so constructed that in the event of power failure a manual mechanical means to release and open the doors is provided at each door and either emergency power in accordance with ch. COMM 16 is provided for the power operation or a remote manual mechanical release is provided.

This provision is intended to provide hardware at each door which can be manually operated (can be a key) so as to open the door from that location. In addition, emergency power would have to exist unless a remote release (not affected by power loss such as a lever and cable system) mechanism which can be operated from a remote location is also provided.

(b) Mechanically operated sliding doors or mechanically operated locks shall be provided with a manual mechanical means to release and open the door at the door.

(3) REMOTE UNLOCKING. Doors remotely unlocked under emergency conditions shall not automatically relock when closed unless specific action is taken at the remote location to enable doors to relock.

(4) STANDBY EMERGENCY POWER. Standby emergency power shall be provided for all electrically power-operated doors and power-operated locks. Power shall be arranged to automatically operate upon failure of normal power within 10 seconds and to maintain the necessary power source for at least 1 1/2 hours.

Part 4 — Protection

COMM 58.60 PROTECTION OF OPENINGS.

(1) DOORS. Doors protecting openings in occupancy separations, smoke barriers, or horizontal exits shall be self-closing fire-resistive door assemblies as specified in s. COMM 51.047.

(2) CLOSING DEVICE. Doors protecting such openings shall be equipped with a closing device and shall normally be kept closed, except the doors may be held open by a hold-open device actuated by products of combustion other than heat. The closing device shall be arranged such that the activation of any of the following systems will initiate the self-closing action of all such doors:

(a) Manual fire alarm systems;

(b) Automatic smoke detection systems;

(c) Fire detection systems; or

(d) Automatic sprinkler systems.

COMM 58.61 PROTECTION OF VERTICAL OPENINGS.

(1) Every elevator shaft, dumbwaiter shaft, laundry chute, wastepaper chute, pipe shaft, rubbish chute and other similar vertical shafts in buildings shall be enclosed with at least 2-hour fire-resistive construction as specified in s. COMM 51.043. All openings shall be protected with fire-resistive door assemblies as specified in s. COMM 51.047.

(2) (a) Vertical open shafts serving tiered multilevel residential housing areas shall be enclosed in accordance with s. COMM 51.02 (11), unless:

1. The entire normally occupied area, including all communicating floor levels, is sufficiently open and unobstructed so that it may be assumed that a fire or other dangerous

condition in any part will be readily obvious to the occupants or supervisory personnel in the area;

2. Exit capacity is sufficient to provide simultaneously for all the occupants of all communicating levels and areas, with all communicating levels in the same fire area being considered as a single floor area for purposes of determination of required exit capacity; and

The intent of this restriction is to not allow the reduction of occupant loads (see s. COMM 51.15 (6)(a)) normally allowed.

3. The height between the highest and lowest finished floor levels does not exceed 13 feet and the number of levels is not restricted.

The exceptions outlined in s. COMM 58.61 (2) are intended to allow open stairways in the tiered multilevel area to be used for egress purposes.

COMM 58.63 FIRE PROTECTION SYSTEMS.

(1) SPRINKLER SYSTEMS. Automatic fire sprinkler systems shall be provided as outlined in ss. COMM 52.01, 52.011, 52.012 and 52.013.

Section COMM 52.01 is a reference to the complete automatic sprinkler system in a high-rise building as is the reference to s. COMM 52.013 which is for a low-rise building having a prisoner load of 6 or more, including program support facilities. Sections COMM 52.011 and 52.012 are referencing systems which may provide only partial automatic sprinkler protection and how the sprinklered areas are to be separated from unsprinklered areas.

(2) STANDPIPE SYSTEMS.

(a) *First-aid standpipes.* First-aid standpipes shall be provided as specified in s. COMM 51.21 for all detention and correctional facilities 60 feet or less in height, unless an approved automatic sprinkler system is installed.

(b) *Fire department standpipes.* Fire department standpipes shall be provided in all detention and correctional facilities exceeding 60 feet in height and shall comply with s. COMM 51.21.

(3) FIRE EXTINGUISHERS. Portable fire extinguishers shall be provided and maintained as specified in s. COMM 51.22.

Note: The department will accept placing portable fire extinguishers in a manner as indicated in s. COMM 58.64 (1) or (2) to minimize their potential for being used as weapons.

COMM 58.64 FIRE ALARMS.

All detention and correctional facilities shall have a manually operated fire alarm system as specified in s. COMM 51.24, except as modified in this section.

(1) MANUAL FIRE ALARM BOXES. Manual fire alarm boxes may be locked, providing all staff carry the key which will unlock the fire alarm box.

(2) LOCATION OF MANUAL FIRE ALARM BOXES. Manual fire alarm boxes may be located at staff locations in lieu of being located at exits and stairways.

COMM 58.65 AUTOMATIC SMOKE DETECTION SYSTEM.

(1) LOCATION. An approved automatic smoke detection system shall be installed in all sleeping rooms, holding rooms and in all corridors in connection with the sleeping room areas.

Such systems shall be installed in accordance with NFPA 72E but in no case shall smoke detectors be spaced more than 30 feet apart on center or more than 15 feet from any wall, except as provided in sub. (2). All automatic smoke detection systems required by this section shall be electrically interconnected to the fire alarm system.

(2) EXCEPTION. Other arrangements and positioning of smoke detectors may be used to prevent damage or tampering or for other purposes provided the function of detecting any fire is fulfilled. This may include the location of detectors in exhaust ducts from sleeping rooms, behind grills, or in other locations.

Note: See s. COMM 52.015 for requirements pertaining to automatic fire sprinkler systems for detention and correctional facilities.

COMM 58.66 INTERIOR FINISHES.

(1) WALLS AND CEILINGS. Interior finish of walls and ceilings in corridors, exits and any space not separated from exit access corridors and exits by a partition capable of retarding the passage of smoke shall be Class A. All other areas shall be Class A, B or C as defined in s. COMM 51.01 (75a).

(2) FLOORS. Interior floor finish in corridors and exits and any space not separated from exit access corridors and exits by a partition capable of retarding the passage of smoke shall be Class I as defined in s. COMM 51.01 (75a).

COMM 58.67 SMOKE BARRIER.

(1) FIRE-RESISTIVE RATING. Smoke barriers shall have a one-hour fire-resistive rating as specified in s. COMM 51.04.

(2) WHERE REQUIRED. Smoke barriers are required to:

(a) Divide every story used by residents for sleeping, and any other story having an occupant load of 50 or more persons, into at least 2 compartments;

If any level is used for detention (i.e., rooms or holding areas with secured exits), even if it is only a small part of the entire area and properly separated (occupancy separation), a smoke barrier is required. The major failing point normally associated with this issue is when small holding rooms or areas are created and the smoke compartment is created by the occupancy separation with no exit (i.e., stairway enclosure, exit to grade, etc.) located within the smoke zone/compartment. Such a layout is not acceptable as it creates conflicts with several of the egress concepts and requirements related to facilities of this type.

(b) Limit the housing of a maximum of 175 residents in any smoke compartment; and

(c) Limit on any story the length and width of each smoke compartment to no more than 150 feet.

(3) AREA. At least 6 square feet of accessible area per occupant shall be provided on each side of the smoke barrier for the total number of occupants in adjoining compartments.

(4) DOORS.

(a) Openings in smoke barriers shall be protected by doors at least 36 inches wide, and such doors shall swing in the direction of egress. Where egress may be in either direction, a pair of swinging doors shall be provided where each door swings in a direction opposite from the other, except doors in a means of egress may be of the horizontal sliding type providing the force to slide the door to its fully open position does not exceed 37 lbs.

(b) Doors in smoke barriers shall have at least a 20-minute fire-resistive rating, except that doors may be held open as specified in s. COMM 58.60.

(c) Louvers and grills in smoke barrier doors are prohibited. Doors may be undercut to a maximum of 3/4 inches.

(d) A vision panel, complying with s. COMM 51.048 for wired glass and not exceeding 1,296 square inches and set in steel frames, shall be provided in each door in a smoke barrier.

(e) Rabbets, bevels, or astragals are required at the meeting edges of doors, and stops are required on the head and sides of door frames.

(5) DAMPERS. An approved damper designed to resist the passage of smoke shall be provided at each point a duct penetrates a smoke barrier. The damper shall close upon detection of smoke by an approved smoke detector, located within the duct except that:

(a) The approved damper, if located above a smoke barrier door, may be arranged to close upon detection of smoke by the local device designed to detect smoke on either side of the smoke barrier door opening; or

(b) Buildings designed with an engineered smoke control system as specified in NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems, need not comply with this requirement.

Part 5 —Sanitary Facilities

COMM 58.68 SANITARY FACILITIES.

(1) TOILET ROOMS. Every building included under the scope of this subchapter shall be provided with separate toilet rooms for each sex, and shall comply with the requirements specified in this section and ss. COMM 52.52 to 52.62.

(a) *Exceptions.*

1. Enclosure of fixtures as specified in s. COMM 52.59 shall be required only for fixtures used by the staff or visitors, or both.

2. Water closet seats as specified in s. COMM 52.60 (1) are not required on water closets used by residents in maximum security detention and correctional facilities.

(2) SANITARY FIXTURES.

(a) *Residents.* The number of sanitary fixtures required for each sex shall be determined in accordance with the ratios specified in Table 58.68.

(b) *Employes.* The number of sanitary fixtures for employes shall be provided in accordance with the requirements specified in Table 54.12-B and s. COMM 52.04 (4) and (8).

(c) *General public.* The number of sanitary fixtures for the general public shall be provided in accordance with the requirements specified in Table 54.12-A and s. COMM 52.04 (4) and (8).

TABLE 58.68
NUMBER OF SANITARY FIXTURES REQUIRED FOR RESIDENTS OF DETENTION AND CORRECTIONAL FACILITIES[1,2]

Type of Fixture			
Water Closets	Urinals (U)		

Males (M)	Females (F)	Males (M)	Lavatories ;(L)	Bathtubs or Showers
One (WC) for each 8 (M) or fraction	One (WC) for each 8 (F) or fraction	Urinals may be substituted for up to 2/3 of the required number of (WC) for (M)	One (L) for each 8 persons or fraction	One for each 10 persons or fraction

[1] For structures with additions or alterations, the required number of sanitary fixtures shall be the sum of the fixtures required for the existing portion at the time it was constructed plus the the fixtures required by this table for the new addition or altered area. At such time as the summation of the addition and alteration area is equal to or greater than 51% of the building area calculated as specified in s. COMM 50.03 (4)(d), fixtures shall be provided in conformance to this table utilizing the capacity of the entire building.

[2] Where a single toilet room designated as UNISEX is provided, it shall be considered as accommodating no more than 10 employes and 25 occupants.

[3] In places of detention, the number of shower heads as specified in this table may be reduced provided a written statement is submitted to the department from the sheriff or jail administrator confirming that the shower facilities will be operated under scheduled shower times. In this case, the number of shower heads may be based on the number of occupants using the shower facilities at one scheduled time period. A minimum of 2 shower heads shall be provided.

When increasing the occupant load is being considered, additional provisions must also be considered for increases in people-to-shower-head ratios.

Question: *Can the number of shower heads required by Table 58.68 be reduced in places of detention operated in compliance with scheduled shower times?*

Answer: *Yes, the current system used to schedule shower times for security/safety reasons in controlled areas separated from the inmate housing area does not require the number of shower heads specified in Table 58.68.*

The department will accept a reduced number of shower heads under COMM 50.02, provided a statement is submitted from the sheriff or jail administrator confirming that the facilities will be operated with scheduled shower times. The number of shower heads provided may be based on the number of inmates using the shower at one time. A minimum of two shower heads shall be provided.

Part 6 — Guard Towers

COMM 58.69 GUARD TOWERS AND OBSERVATION STATIONS.

(1) CLASS OF CONSTRUCTION.

(a) Except as provided in par. (b), guard towers shall be of type 1, 2 or 3 construction as specified in s. COMM 51.03.

(b) Guard towers classified as Type 3 construction may have a noncombustible roof assembly with no fire-resistive rating. A Class A roof covering is acceptable.

(2) MEANS OF EGRESS. At least one exit stairway shall be provided from a guard tower or observation station and shall be a minimum of 28 inches in width. Spiral stairways are permitted to serve guard towers and observation stations not greater than 150 net square feet. Spiral stairways shall comply with s. COMM 51.16 (7).

(3) INTERIOR FINISH. The interior finish of guard towers and observation stations shall be of Class A or B as defined in s. COMM 51.01 (75a).

(4) HIGH HAZARD MATERIAL. Storage of high hazard material is prohibited in the guard tower, observation station, or immediate vicinity, except for weapons, ammunition, and control chemicals in quantities required for use by the staff occupying the tower or observation station.

(5) PROTECTION OF VERTICAL OPENINGS. Every stairway, elevator shaft, dumbwaiter shaft, or other similar vertical openings shall be enclosed with at least 2-hour fire-resistive construction as specified in s. COMM 51.043, except guard towers and observation stations where there is no occupancy below the top floor level, stairs may be unenclosed.

(6) SANITARY FACILITIES.

(a) Toilet facilities are not required in guard towers or observation stations provided toilet facilities are available in adjacent buildings to accommodate the number of occupants in the guard towers or observation stations.

(b) Toilet fixtures which are provided in single-employe guard towers need not be enclosed as specified in ss. COMM 52.50 and 52.59.

It is noted that when single-person guard towers elect to provide sanitary facilities on the "observation" level, providing the walls normally associated with a "toilet room" (See 52.50) create an obstruction to the ***vision*** *which is the primary purpose for being on such a level. Accordingly, we will permit the "unenclosed" water closet the same as would be permitted in a single fixture toilet room. This is based on the entire observation level becoming the single fixture toilet room while being used for that purpose.*

(7) DOOR LOCKS. Doors to guard towers may be locked in accordance with s. COMM 58.59.

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Chapter COMM 59

HAZARDOUS OCCUPANCIES

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COMM 59.001 SCOPE.

This chapter applies to all hazardous occupancies as indicated in the scope of each subchapter.

At the present time, Chapter COMM 59 applies only to garages. Buildings which may be classified as having hazardous contents where those hazardous contents are not motor vehicles will fall under the scope of Chapter COMM 54.

Typically buildings falling under the scope of this chapter, perhaps with the exception of pure storage garages, will involve combustible or flammable liquids. The provisions of Chapter COMM 10 should be considered as that chapter relating to flammable and combustible liquids does contain construction requirements which may be more restrictive than those found in this code.

See COMM 62.995 for mini-storage buildings.

COMM 59.01 DEFINITIONS.

(1) **"Combustible liquid"** means a liquid as defined in s. ILHR 10.01(22).

(2) **"Flammable liquid"** means a liquid as defined in s. ILHR 10.01(37).

(3) **"Motor vehicle"** means any self-propelled device fueled by a flammable or combustible liquid used to transport people or goods.

In addition to automobiles, buses, trucks, and motorcycles, the department considers riding lawn mowers, garden tractors, inboard and outboard boats, snowmobiles, and any other vehicle capable of transporting a person as a motor vehicle. Other pieces of equipment involving internal combustion engines such as push lawn mowers, snow blowers, chain saws, etc., are not considered motor vehicles and occupancies servicing such equipment will fall under the scope of Chapter COMM 54.

(4) **"Open parking structure"** means a structure as defined in s. COMM 62.10.

(5) **"Private garage"** means a structure or a part of a structure, either attached to a one- or 2-family dwelling or unattached but serving the dwelling, housing one or more motor vehicles owned by the occupant of the dwelling and used only for personal or family service, not serving as a place of employment.

ALLOWABLE HEIGHT (STORIES) AND AREA (SQUARE FEET) FOR BUILDINGS WITHOUT COMPLETE AUTOMATIC FIRE SPRINKLER SYSTEM PROTECTION (MAXIMUM GROSS FLOOR AREA PER FLOOR)

NOTE:#1: DO NOT USE FOR BUILDINGS EXCEEDING 60 FEET IN HEIGHT

NOTE #2: FOR STORAGE GARAGES ONLY. USE 75% OF VALUES FOR REPAIR GARAGES.

	Class of Construction	Building Frontage Street* Exposure	Number of Stories								
			1	2	3	4	5	6	7	8	Over 8
1.	Fire-Resistive Type A	1	25,000	22,000	19,000	16,000	13,000	11,000	9,000	8,000	6,000
		2	30,500	27,000	24,000	20,500	17,500	15,000	13,000	12,000	10,000
		3	36,000	33,000	29,000	25,000	22,000	19,000	17,000	16,000	14,000
		4	41,500	39,000	34,000	29,500	26,500	23,000	21,000	20,000	18,000
2.	Fire-Resistive Type B	1	23,000	20,000	17,000	14,000	11,000	9,000	7,000	6,000	
		2	28,500	25,000	22,000	18,500	15,500	13,000	11,000	10,000	N.P.
		3	34,000	31,000	27,000	23,000	20,000	17,000	15,000	14,000	
		4	39,500	37,000	32,000	27,500	24,500	21,000	19,000	18,000	
3.	Metal Frame Protected	1	21,000	18,000	15,000	12,000					
		2	26,500	23,000	19,500	16,000	N.P.	N.P.	N.P.	N.P.	N.P.
		3	32,000	28,000	24,000	20,000					
		4	37,500	33,000	28,500	24,000					
4.	Heavy Timber	1	17,000	14,000	11,000	9,000					
		2	22,000	19,000	16,000	13,500	N.P.	N.P.	N.P.	N.P.	N.P.
		3	27,000	24,000	21,000	18,000					
		4	32,000	29,000	26,000	22,500					
5A.	Exterior Masonry Protected	1	15,500	13,500	9,500	8,000					
		2	20,000	17,000	14,000	12,500	N.P.	N.P.	N.P.	N.P.	N.P.
		3	24,500	21,500	18,500	15,500					
		4	29,000	26,000	23,000	19,500					
5B.	Exterior Masonry Unprotected	1	14,000	11,500	9,000	7,000					
		2	18,000	15,000	12,500	10,000	N.P.	N.P.	N.P.	N.P.	N.P.
		3	22,000	19,000	16,000	13,000					
		4	26,000	23,000	19,500	16,000					
6.	Metal Frame Unprotected	1	14,000	11,500	9,000						
		2	18,000	15,000	12,500	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
		3	22,000	19,000	16,000						
		4	26,000	23,000	19,500						
7.	Wood Frame Protected	1	12,500								
		2	16,000	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
		3	19,000								
		4	22,000								
8.	Wood Frame Unprotected	1	10,000								
		2	12,000	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
		3	14,000								
		4	16,000								

N.P. means Not Permitted

* 4-hour fire division wall may be considered as a street for the purpose of computing the area limitations for this table provided that no subdivided portion of the building has more streets than the entire building

TABLE 59.12-2

ALLOWABLE HEIGHT (STORIES) AND AREA (SQUARE FEET) FOR BUILDINGS COMPLETELY PROTECTED BY AUTOMATIC FIRE SPRINKLER SYSTEM

(MAXIMUM GROSS FLOOR AREA PER FLOOR)

NOTE #1: USE FOR ALL BUILDINGS

NOTE #2: FOR STORAGE GARAGES ONLY. USE 75% OF VALUES FOR REPAIR GARAGES.

	Class of Construction	Building Frontage Street* Exposure	Number of Stories 1	2	3	4	5	6	7	8	9	Over 9
1.	Fire-Resistive Type A One street required for unlimited area. See s. COMM 51.01 (124).	1 2 3 4	NO LIMIT									
2.	Fire-Resistive Type B One street required for unlimited area. See s. COMM 51.01 (124).	1 2 3 4	NO LIMIT	69,000 85,500 102,000 118,500	60,000 75,000 93,000 111,000	51,000 66,000 81,000 96,000	42,000 55,500 69,000 82,500	33,000 46,500 60,000 73,500	27,000 39,000 51,000 63,000	21,000 33,000 45,000 57,000	18,000 30,000 42,000 54,000	N.P.
3.	Metal Frame Protected	1 2 3 4	84,000 106,000 128,000 150,000	63,000 79,500 96,000 112,500	54,000 69,000 84,000 99,000	45,000 58,500 72,000 85,500	36,000 48,000 60,000 72,000	N.P.	N.P.	N.P.	N.P.	N.P.
4.	Heavy Timber	1 2 3 4	68,000 88,000 108,000 128,000	51,000 66,000 81,000 96,000	42,000 57,000 72,000 87,000	33,000 48,000 63,000 78,000	27,000 40,500 54,000 67,500		N.P.	N.P.	N.P.	N.P.
5A.	Exterior Masonry Protected	1 2 3 4	62,000 80,000 98,000 116,000	46,500 60,000 73,500 87,000	40,500 51,000 64,500 78,000	28,500 42,000 55,500 69,000	24,000 37,500 46,500 58,500		N.P.	N.P.	N.P.	N.P.
5B.	Exterior Masonry Unprotected	1 2 3 4	56,000 72,000 88,000 104,000	42,000 54,000 66,000 78,000	34,500 45,000 57,000 69,000	27,000 37,500 48,000 58,500	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
6.	Metal Frame Unprotected	1 2 3 4	56,000 72,000 88,000 104,000	42,000 54,000 66,000 78,000	34,500 45,000 57,000 69,000	27,000 37,500 48,000 58,500	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
7.	Wood Frame Protected	1 2 3 4	50,000 64,000 76,000 88,000	37,500 48,000 57,000 66,000	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
8.	Wood Frame Unprotected	1 2 3 4	40,000 48,000 56,000 64,000	30,000 36,000 42,000 48,000	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.

N.P. Not permitted

* A 4-hour fire division wall may be considered as a street for the purpose of computing the area limitations for this table provided that no subdivided portion of the building has more streets than the entire building

COMM 59.13 TYPES OF EXITS.

(1) GENERAL.

(a) Only the following types of exits shall be used to comply with the provisions of s. COMM 59.14:

1. Standard exit as specified in s. COMM 51.15, except as provided in sub. (2);
2. Stairways as specified in s. COMM 51.16, except as provided in sub. (2);
3. Smokeproof stair tower as specified in s. COMM 51.17;
4. Interior enclosed stairway as specified in s. COMM 51.18;
5. Horizontal exit as specified in s. COMM 51.19;
6. Fire escapes as specified in s. COMM 51.20; and
7. Nonparking access ramps with a maximum slope of 1:8.

(b) At least half of the exits required under s. COMM 59.14 shall be standard exits, stairways, smokeproof stair towers or interior enclosed stairways to grade.

(2) EXCEPTIONS.

(a) A spiral stairway shall not serve as a required exit, but may be used as an employe convenience stairway if located in nonpublic areas.

Spiral stairs must be located in an employee use areas only. Spiral stairs will not be permitted in any location accessible by customers or building frequenters.

(b) The width of required exit stairways serving unoccupied areas, such as storage areas, equipment mezzanines and similar areas not exceeding 750 sq. ft. may be reduced to 3 feet 0 inches.

(c) Doors in standard exits serving rooms, spaces or areas with an occupancy load of 25 persons or less are not required to swing in the direction of egress.

(d) A door not complying with s. COMM 51.15 (2), may be used as a standard exit serving storage garages or storage areas not exceeding 3,000 square feet in area.

This exception will permit an overhead garage door as the only exit from an storage garage not exceeding 3,000 square feet in area.

Note: Where accessibility and interior circulation for persons with functional limitations must be provided, the requirements of s. COMM 52.04 (9) govern.

COMM 59.14 NUMBER AND LOCATION OF EXITS.

(1) GENERAL.

(a) Every floor level and every room, space or area of a storage garage and a repair garage shall be provided with at least 2 exits.

See COMM 54.02 (5) commentary.

(b) One exit is permitted in the following conditions:

Please note that exceptions 1, 2 and 3 apply only to rooms and spaces. These exceptions do not apply to floor levels. Every floor level, except as provided in 4, must have at least two exits.

1. Any room, space or area used for storage garage purposes with an occupancy load of 10 persons or less and which does not exceed 3,000 sq. ft. in net floor area;

2. Any room, space or area used for repair garage purposes and which does not exceed 750 sq. ft. in net floor area;

3. Any room, space or area used as other than a storage or repair garage with a capacity of 25 persons or less; and

4. A mezzanine floor level, provided the mezzanine is:

*In order for a mezzanine floor level to have a single exit, **all** four criteria as outlined by a, b, c and d must be met.*

a. Three thousand square feet or less in net floor area;

b. Used only for storage purposes;

c. Open on at least one side to the floor below; and

d. Not more than 12 feet above the floor below.

***Question:** Define the difference between a small open basement and a pit and indicate the required exiting for the two conditions.*

***Answer:** Basement is defined per COMM 51.01 (10) a basement floor is at level below the first or ground floor with its entire floor below exit discharge to grade. Exiting for a basement shall be in accordance with COMM 54.02/59.14 (1)(a) indicating every floor level shall have at least two exits.*

A pit is defined differently from a basement as being a hole which does not lead anywhere equal in area to the opening directly above. Exiting for a pit may be via a single standard stair. Exit stairs for pit should be located such that a vehicle parked above the pit does not block the stairs.

(2) EXIT DISTANCE. Exits shall be provided and distributed as follows:

See COMM 54.02 commentary.

(a) *Storage garages.*

1. No area of a storage garage shall be more than 100 feet from an exit, unless the entire storage garage is protected by an automatic sprinkler system.

2. No area of a storage garage entirely protected by an automatic fire sprinkler system shall be more than 200 feet from an exit.

(b) *Repair garages.*

1. No area of a repair garage shall be more than 75 feet from an exit, unless the entire repair garage is protected by an automatic fire sprinkler system.

2. No area of a repair garage entirely protected by an automatic fire sprinkler system shall be more than 150 feet from an exit.

(c) *Measurement of exit distance.* The exit distances required by this section shall be measured along public passageways and aisles to:

1. Standard exits leading to grade as specified in s. COMM 51.15;

2. Doors opening into smokeproof stair towers as specified in s. COMM 51.17, interior enclosed stairways as specified in s. COMM 51.18, or fire escapes as specified in s. COMM 51.20; or

3. Horizontal exits as specified in s. COMM 51.19.

(3) LOCATION OF EXITS. Except as provided in sub. (1) (b), exits in all storage garages and repair garages shall be located and distributed so that in the event an exit is blocked, another exit is available from every area of the storage garage or repair garage.

(4) EXIT LIGHTS. All required exits shall be identified by an approved exit light. Directional exit lights shall be provided to direct occupants to the exits. Exit lights and directional exit lights shall be as specified in s. COMM 51.15 (5).

(5) EXIT MAINTENANCE. Exits shall be maintained in accordance with s. COMM 52.21.

COMM 59.15 REQUIRED EXIT WIDTH.

(1) GENERAL. Every floor level of a storage garage and repair garage shall be provided with at least the required aggregate width of exits as specified in ss. COMM 51.15 (6) and 51.16 (3).

(2) HORIZONTAL EXITS. Horizontal exits may provide up to one-half of the required aggregate width of exits for a floor level.

COMM 59.16 CAPACITY OF STRUCTURES.

In calculating the required aggregate width of exits under s. COMM 59.15 and the required number of sanitary facilities under s. COMM 59.20, the capacities of structures and floor levels shall be computed on the following basis:

(1) Storage garages and repair garages - 300 sq. ft. per person; and

(2) Other areas as dictated by the appropriate sections of chs. COMM 54 to 62.

Capacities. *The occupant load of storage garages and repair garages is based on 300 square feet per person. We will not accept a statement from the owner or operator establishing a different occupant load, if less than that determined by area. Areas of garage buildings used for other than vehicle storage or repair will have the occupant load based on the appropriate occupancy chapter, Chapters COMM 54--COMM 62.*

Note: See ss. COMM 54.05, 55.06, 56.07 for additional requirements.

COMM 59.17 ENCLOSURE OF STAIRWAYS AND SHAFTS.

(1) TWO FLOOR LEVELS.

(a) All stairways and vertical openings serving 2 floor levels shall be enclosed with smoke partitions, unless:

1. The stairway or opening serves an open storage mezzanine less than 3,000 square feet in area;

2. The opening is not a required means of egress and the opening is separated from any exit access corridor or exit stairway by at least smoke partitions as specified in par. (a); or

3. The two-connected floor levels:

a. Are each provided with 6 air changes of exhaust ventilation per hour;

b. Are provided with interconnected fire detectors in accordance with NFPA 72;

Fire detectors include smoke or heat detectors.

c. Do not have open flame equipment located in the lower level; and

d. Have only pneumatic power equipment available for use.

Please note that the criteria allowing two connected floor levels apply to both of the floor levels except for criteria c. The six air change requirement, fire detectors, and pneumatic only power equipment are applicable to both the upper and lower levels.

(b) Smoke partitions enclosing stairways or vertical openings shall be constructed of solid and rigid materials.

(c) Openings in smoke partitions shall be protected with doors equipped with automatic closing devices.

Question: *COMM 59.17 (1)(a) requires stairways serving two floor levels to be enclosed with smoke partitions. Is just a cutoff at the top of the stairs satisfactory or is an enclosure around the stairs at all levels required?*

Analysis: *The intent of the partition around stairs in a garage use is to prevent gas fumes from settling to lower levels and also to provide an enclosure around stairs to provide a smoke-free environment as one transverses a stair to a level of exit discharge. It should be noted that protection of openings in Chapter 59 is* ***more restrictive*** *than a typical Chapter 54 use because no openings between floor levels are allowed except for restricted exceptions satisfied in s. COMM 59.17 (1)(a) 1. through 3.*

Answer: *Smoke partitions shall be provided to encapsulate the stairway. This enclosure shall include doors equipped with automatic closing devices at the top and bottom of the stairs. COMM 59.17 does not require the stair to be enclosed to the outside.*

(2) THREE OR MORE FLOOR LEVELS. Stairways and shafts serving 3 or more floor levels shall be enclosed pursuant to s. COMM 51.18 with fire-resistive construction as specified in Table 51.03-A.

COMM 59.18 VEHICULAR GUARDRAILS.

Vehicular guardrails shall be provided at all floor openings and at all differences in floor level elevations as follows:

(1) DRIVE LANES. Vehicular guardrails shall be installed at the end of drive lanes and shall be designed for a minimum horizontal live load of 1000 pounds per linear foot acting at 18 inches above the floor level; and

(2) PARKING STALLS. Vehicular guardrails shall be installed at the end of parking stalls and shall be designed for a minimum horizontal live load of 500 pounds per linear foot acting at 18 inches above the floor level.

COMM 59.19 ILLUMINATION LEVELS.

(1) EXITS. All stairways and exits and the passageways leading to them shall be illuminated to facilitate egress. The intensity of illumination shall be not less than 10 foot-candles at the floor or step level.

(2) DRIVING AREAS. The minimum illumination level for driving areas at a horizontal plane 30 inches above the floor shall be an intensity of at least 2 foot-candles.

COMM 59.20 SANITARY FACILITIES.

(1) GENERAL. Sanitary facilities shall be provided as specified in ss. COMM 54.12, 55.32 or 56.16, as appropriate for the use of the building.

(2) UNATTENDED STORAGE GARAGES. Sanitary facilities are not required to be provided in unattended storage garages.

COMM 59.22 OCCUPANCY SEPARATIONS AND HAZARD ENCLOSURES.

Occpancies within the scope of this chapter shall be separated from other occupancies or uses in accordance with s. COMM 51.08. Hazards shall be enclosed in accordance with s. COMM 51.08.

Question: *Occupancy separations, per COMM 51.08, are not required between the vehicle areas and employee dormitory areas of fire stations. What portions of COMM 57 should be applied to the dormitory areas of fire stations and similar occupancies?*

Answer: *These types of buildings are primarily classified under an occupancy chapter other than COMM 57, and are therefore subject to the basic requirements of the appropriate occupancy chapter. Since the use of the portions of these buildings as* ***temporary employee residences are directly related to the primary business*** *of the building, many of the COMM 57 requirements are not applicable, and need not be imposed.*

The following COMM 57 requirements ***are applicable*** *to employee sleeping and living areas of buildings where employees are provided such areas due to the length of a work shift* ***AND*** *where the building is under constant supervision by non-sleeping employees:*

COMM 57.03 (1) Number of exits.

COMM 57.03 (2) Exit distribution.

COMM 57.04 (1)(a) Sleeping area capacity.

COMM 57.05 (1) Types of exits.

COMM 57.06 (1) Exit doors.

COMM 57.06 (3) Access doors.

COMM 57.07 (1) Exterior stairs.

COMM 57.07 (2) Interior stairs.

COMM 57.08 Enclosure of stairways and shafts. Most restrictive between this and other occupancy chapter requirements shall comply.

COMM 57.09 Passageways.

COMM 57.10 Illumination of exits.

COMM 57.12 Sanitary facilities.

COMM 57.13 Windows.

COMM 57.16 Smoke detection.

COMM 57.17 Fire alarms.

COMM 57.18 Fire extinguishers.

The COMM 57 requirements not indicated should not be applied.

This consideration can be applied to occupancies other than fire stations and ambulance services, such as truck terminals, police stations, etc., provided the constant supervision by other employees is provided, and provided the sleeping occupants are employees of the building operator.

COMM 59.23 FIRE PROTECTION SYSTEMS.

(1) SPRINKLER SYSTEMS. Automatic fire sprinkler systems shall be provided as outlined in ss. COMM 52.01, 52.011, 52.012 and 52.013.

(2) STANDPIPES.

(a) Fire department standpipes shall be provided as follows:

1. In all storage garages and repair garages 3 or more stories in height; and

2. In all storage garage and repair garage floor levels more than 500 sq. ft. in area, located below grade and not accessible to fire fighting vehicles.

Standpipes provided in accordance with this section of the code need only serve those storage garage and repair garage floor levels located below grade. The standpipe need not extend to all other floor levels in the building.

(b) Required fire department standpipes with a fire department siamese connection greater than 50 feet to a street shall be interconnected to a standpipe system with such a connection 50 feet or less to a street.

(c) Required fire department standpipes shall be provided in each stair enclosure serving a storage or repair garage and shall be provided with approved 2 1/2 in. valve hose connections at each floor level with one connection in the stair tower and one immediately outside.

(d) Fire department standpipes shall conform to the requirements specified in s. COMM 51.21 (3)(e) to (i).

Please note that the fire department standpipe need not conform to all of the requirements of COMM 51.21 (3). Only (e) to (i) are applicable. Therefore, the number of standpipes needed to reach every part of the floor area, the cross connections between two or more standpipes and the hose outlet locations, as well as the automatic water supply, are not applicable to standpipes provided under this section of the code.

(e) 1. The department will recognize alternative systems and designs in lieu of required fire department standpipes, if an equivalent degree of safety is provided in storage or repair garages 60 feet or less in height.

2. The department will accept storage garages or repair garages without fire department standpipes, if clearances are provided to allow fire fighting vehicles access throughout the storage or repair garages.

Storage garages have been submitted and approved under this section of the code where the design is based upon equipment currently in use by the local fire department, typically a small, low clearance vehicle. Designers should be aware that should the local fire department change equipment such that the equipment can no longer gain access throughout the garage, standpipes will then be required.

3. Fire department standpipes as specified in this subsection need not be provided in buildings 60 feet or less in height completely protected by an automatic fire sprinkler system.

4. Fire department standpipes shall be provided in buildings more than 60 feet in height in accordance with s. COMM 51.21 (3).

(3) FIRE EXTINGUISHERS. Portable fire extinguishers shall be provided and maintained as specified in s. COMM 51.22.

Note 1: See ch. COMM 52, subch. II for requirements pertaining to automatic fire sprinkler systems.

COMM 59.24 FIRE ALARMS.

A fire alarm system complying with s. COMM 51.24 shall be provided in every storage garage and repair garage where more than 10 persons are employed above the second story except storage garages and repair garages which are provided with a complete automatic sprinkler system.

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Chapter COMM 60

CHILD DAY CARE FACILITIES

COMM 60.001 SCOPE. 1
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COMM 60.10 OCCUPANCY SEPARATIONS AND HAZARD ENCLOSURES. 2
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COMM 60.15 SANITARY FACILITIES. 3
COMM 60.16 ELECTRICAL WORK. 4
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COMM 60.38 EXIT AND EMERGENCY LIGHTING. 8

Note: See ch. HFS 45 relating to day care licensing.

COMM 60.001 SCOPE.

(1) (a) The requirements of this chapter shall apply to all buildings or parts of buildings which accommodate public or private day care centers for 9 or more children.

A preschool must be designed either as a Chapter 56 or Chapter 60 building, depending on compliance with the scope of the occupancy chapters.

When converting an existing building to a day care center or locating a day care center in an existing building, it is typically not necessary to submit plans for review and approval. The procedure for obtaining approval for day care centers in existing buildings is outlined at the end of this chapter. New buildings, however, must be submitted to the state or its authorized representative for review and approval.

While day care centers accommodating less than nine children are not required to be submitted to the S&BD, they are subject to the rules of the Department of Health and Family Services.

(b) The requirements of this chapter shall not apply to public school programs defined in s. 115.01 (1), Stats., or private school programs defined in s. 121.51 (3), Stats., or to short-time programs such as Boy Scouts, Girl Scouts, Sunday school and similar type programs.

Note: Refer to ch. HFS 45, rules of the department of health and family services, for requirements pertaining to day care centers serving 4 to 8 children and to HFS 46 for licensing requirements for group day care centers serving more than 9 children. Where more than one code applies, an owner must comply with the most restrictive requirements from the applicable codes.

(2) Chapters COMM 50 to 53 are applicable for general and structural design requirements. Chapters COMM 63 and 64 are applicable to newly constructed day care centers and to alterations to mechanical systems.

(3) School age day care programs for children 5 years of age and older shall comply with the requirements of one of the following chapters:

The allowance to omit doors to the toilet rooms and compartments for the water closets applies only to those toilet rooms used exclusively by children under the age of 10. If staff and older children are expected to use the toilet room, doors and water closet compartments are required.

(4) SEX DESIGNATION. Separate toilet rooms for each sex shall be provided and available for staff members in day care centers having 10 or more staff members at any one time.

Note 1: The term "staff member," as used in this section, is intended to include all employes, whether on pay status or on a volunteer status.

Note 2: The intent of sub. (3) is to allow toilet rooms used in common by both sexes in day care centers with less than 10 adults, and to omit the privacy requirements of toilet room doors and water closet compartment doors only for children who have not reached the age of sex awareness.

COMM 60.16 ELECTRICAL WORK.

(1) The electrical systems in existing buildings proposed to be used as day care centers shall conform to the Wisconsin state electrical code, volume 2, ch. Comm 16.

(2) Special protective receptacle covers shall be installed in all areas occupied by children.

The intent of this rule is to protect small children from electrical shock by protecting plug receptacles. The department will accept plastic plug-in type covers available through most discount department stores.

COMM 60.17 ILLUMINATION.

The illumination for occupied areas, other than sleeping areas, shall have a minimum intensity of 20 foot-candles at a horizontal plane 24 inches above the floor. All other spaces shall meet the requirements of s. Ind 19.04.

COMM 60.18 HEATING AND VENTILATING.

(1) The heating system shall be capable of maintaining an inside temperature of not less than 67° F.**(2)** Outside air at the rate of 7.5 cfm per person or as specified in s. COMM 64.05 shall be provided for centers that do not comply with the openable window requirements of s. COMM 60.13 (2).

Due to provisions of COMM 64.05, this requirement applies to the entire center, not just the sleeping rooms.

The provisions of COMM Table 64.05 state that openable windows are NOT allowed for "Day care facilities". Because this is in conflict with 60.18(2), the most stringent requirement shall apply which in this case is that the percent openable window requirement may NOT be used to fulfill the need for outside air.

COMM 60.19 OPERATING FEATURES.

(1) Fire prevention inspections shall be conducted monthly. A copy of the latest completed inspection form shall be posted in a conspicuous place in the day care facility.

(2) A fire evacuation plan shall be practiced not less than once per month. Fire alarm and/or smoke detection systems shall be tested at weekly intervals. It is recommended that fire safety be a part of the educational program of the center.

(3) Furnishings, decorations, or other objects shall not be so placed as to obstruct exits, access thereto, egress therefrom, or visibility thereof.

(4) Flammable and combustible liquids shall be stored in areas accessible only to designated individuals and as recommended in NFPA standard No. 30, Flammable and Combustible Liquids Code.

Note 1: NFPA Standard No. 30 is a mandatory standard for the storage of flammable and combustible liquids within the scope of ch. COMM 10.

(5) Guardrails protecting open sides of stairways, elevated platforms, walks, balconies and mezzanines shall have intermediate rails or an ornamental pattern designed to prevent the passage of a sphere with a diameter larger than 6 inches.

COMM 60.30 CLASS OF CONSTRUCTION.

(1) **GENERAL.** Except as specified in sub. (2), the class of construction for day care centers shall comply with Table 60.30 and s. Comm 51.03. Day care centers located in buildings of more than 4 stories shall be provided with one independent stairway serving the day care center only and shall be restricted to the height indicated in Table 60.30.

*The number of stories indicated by Table 60.30 relates to the levels upon which the day care operation is located, **not** the maximum number of floor levels in the building. For instance, a day care center may be located on the first, second, third or fourth stories of a ten-story fire-resistive building. Occupancy by day care is not permitted above the fourth story.*

TABLE 60.30

Type of Construction	Maximum Allowable) Height (feet	Maximum Allowable Number of Stories			
		1	2	3	4
Fire-resistive Type A No. 1 and Type B No. 2	85	X	X	X	X
Metal Frame Protected No. 3 and Heavy Timber No. 4	75	X	X	X	
Exterior Masonry No. 5	50	S	(c)	(a) & (b) or (a) & (d)	
Metal Frame Unprotected No. 6	50	X	(c)	(a)	
Wood Frame Protected No. 7	40	X	X		
Wood Frame Unprotected NO. 8	35	X	(c)		

X = permitted

(a) All floors and supporting members shall have a one-hour fire-resistive rating.

(b) The entire building shall be equipped with an automatic sprinkler system in accordance with s. COMM 51.23.

(c) All ceilings shall be covered with 1/2-inch gypsum wallboard or equivalent.

(d) All floor systems shall be of noncombustible construction.

(2) DAY CARE CENTERS CARING FOR CHILDREN UNDER THE AGE OF 24 MONTHS.

(a) *Types No. 1 to No. 7 construction.* The care of children under the age of 24 months shall be restricted to a floor level of exit discharge in a building of type No. 1 to No. 7, unless all of the following conditions are provided:

1. The entire building shall be completely protected by an automatic fire sprinkler system complying with s. Comm 51.23.
2. Each floor of the day care center where children under the age of 24 months are cared for shall be divided into at least 2 smoke compartments complying with s. COMM 60.39.

(b) *Type No. 8 construction.* The care of children under the age of 24 months shall be restricted to a floor level of exit discharge in buildings of type No. 8 construction.

COMM 60.31 EXITING.

(1) Each floor shall have not less than 2 exits. All required exits shall lead directly, or through an enclosed stairway, to the outside.

Question: Are exterior stairs and/or fire escapes permitted as exits from day care occupancies?

*Answer: Exterior stairs and fire escapes **may not** be used as required exits from the upper levels of day care centers. This directive is not intended to prohibit exterior stairs from the first story exits to grade which as per COMM 51.02 (14)(a) 2.a. may be a maximum of 6 feet above grade.*

Exiting from floor levels above or below the floor of exit discharge must be via interior enclosed stairways. Open stairs and exterior stairs are not permitted. Also, fire escapes are not permitted.

The requirement for interior enclosed stairs does not apply to exterior stairs serving as exits from the first story.

(2) The exits shall be located to provide the best possible means of egress.

(3) Travel distance measured along safe passageways between:

The travel distance limitations are based upon the age of the children, establishing different requirements for those children over the age of 24 months from those under the age of 24 months. When submitting plans for review and approval, designers should indicate on the plans those areas of the day care center which will be occupied by children under the age of 24 months.

(a) Any point in a sleeping room or suite and an exit access door of that room or suite shall not exceed 50 feet;

Sleeping rooms shall be designated on plans. Rooms with no use designated will be assumed to be sleeping rooms for plan review purposes.

(b) Any room door intended as an exit access and an exit shall not exceed 50 feet; and

(c) Any point in a room or suite and an exit shall not exceed 100 feet.

(4) The travel distances in sub. (3) shall be reduced by 50% for children under the age of 24 months.

(5) The travel distances in sub. (3) may be increased by 50 feet in buildings completely protected with an automatic fire sprinkler system. No increase in travel distance is permitted for children under the age of 24 months.

COMM 60.32 REQUIRED EXIT WIDTH.

(1) The total required exit width from a building level shall be in accordance with the requirements of ss. COMM 51.15 (6) and 51.16 (3).

(2) If horizontal exits (s. COMM 51.19) are provided for any floor, the number of persons accommodated on such floor may be increased at the rate of 100 persons for each 40 inches of

width of such exits, provided such increase shall not exceed 100% of the number of persons accommodated by the stairways.

COMM 60.33 PASSAGEWAYS.

(1) The minimum unobstructed width of corridors and passageways shall be determined in the same manner as specified for stairways and exits in s. COMM 60.32. The minimum width shall be not less than 3 feet 8 inches.

(2) The minimum passageway width shall not be less than 3 feet in existing buildings proposed to be used as day care centers, provided the capacity of the day care center does not exceed 40 persons.

COMM 60.34 STAIR AND SHAFT ENCLOSURE.

(1) **GENERAL.** Except as provided in sub. (2), all stairs and vertical shafts serving 2 or more floor levels shall comply with the requirements of s. COMM 51.02 (11) and Table 51.03-A. All required stair enclosures shall lead to the outside without interruption.

Stair enclosures shall comply with 51.18. The section below sets forth exceptions to the requirement for enclosure of stairways as discussed under COMM 60.31. Please note that although interior unenclosed stairways are permitted under certain circumstances, exterior stairs are not permitted.

(2) **EXCEPTIONS.** Unenclosed stairways may be used as required exits in all of the following:

(a) Day care centers located in one story places of worship, providing the care of children under the age of 24 months is restricted to a floor level of exit discharge.

(b) Day care centers located in one and two story schools constructed prior to January 1, 1982, providing the care of children under the age of 24 months is restricted to a floor level of exit discharge.

(c) Day care centers accommodating up to 39 children, providing the care of children under the age of 24 months is restricted to a floor level of exit dischage. The unenclosed stairway shall meet all of the following:

1. The unenclosed stairway connects the floor of exit discharge with only one adjacent floor level.
2. The unenclosed stairway is separated at all other floor levels by fire-resistive rated construction as specified in Table 51.03-A.

COMM 60.35 FIRE PROTECTION SYSTEMS.

(1) **SPRINKLER SYSTEMS.** Automatic fire sprinkler systems shall be provided as outlined in s. COMM 52.012.

(2) **FIRE EXTINGUISHERS.** Portable fire extinguishers suitable for Class B fires shall be provided in kitchens or cooking areas in accordance with s. COMM 51.22.

Class A fires are fires in ordinary combustible materials such as wood, cloth, paper, rubber, and many plastics. Class B fires are fires in flammable liquids gases and greases.

TABLE 60.35

Basic Minimum Extinguisher Rating for Area Specified	Maximum Travel Distance to Extinguishers	Area to be Protected per Extinguisher

		(square feet)
1A	75	3,000
2A	75	6,000
3A	75	9,000
4A	75	11,250
6A	75	11,250

COMM 60.36 FIRE ALARM AND SMOKE DETECTION SYSTEMS.

(1) SMOKE DETECTION SYSTEMS

(a) *Where required.* Except as specified in par. (b), in every building or portion of a building accommodating a day care center serving 9 to 20 children, stand-alone, battery-operated smoke detectors shall be installed in front of doors to the stairways and in the corridors of all floors occupied by the day care center. Smoke detectors shall also be installed in lounges, recreation areas and sleeping rooms in the day care center. The smoke detector alarm shall be audible throughout the day care center.

(b) *Exceptions.* Smoke detectors are not required in the following:

1. A day care center housed only in one room.
2. A day care center serving children 6 years of age or older if no sleeping facilities are provided.

Note: See ch. Comm 69 for requirements on visual alarms.

(2) FIRE ALARM SYSTEMS.

(a) *Where required.* Except as specified in par. (b), every building or portion of a building accommodating a day care center serving more than 20 children, a fire alarm system shall be installed that complies with s. Comm 51.24, or an approved smoke detection system shall be installed that complies with s. Comm 51.245.

(b) *Day care centers caring for children under the age of 24 months.* Where children under the age of 24 months are cared for on floors above or below a floor level of exit discharge, a fire alarm system shall be installed that complies with s. Comm 51.24, or an approved smoke detection system shall be installed that complies with s. Comm 51.245.

Note: See ch. Comm 69 and ADAAG 4.28 for requirements on visual alarms.

COMM 60.38 EXIT AND EMERGENCY LIGHTING.

(1) EXIT SIGNS. All required exit doors and exit passageways in a day care center serving more than 20 children shall be clearly marked with an illuminated exit sign as specified in s. Comm 51.15 (5).

Note: See ch. Comm 16 for requirements for standby emergency power for required exits.

(2) EMERGENCY LIGHTING. Standby emergency power of a type permitted by ch. Comm 16 shall be provided as a source of electrical power for emergency lighting for exit passageways in a day care center where there are more than 20 children receiving nighttime care anytime between from 9 p.m. to 5 a.m. → Table 16.4 to 4.

Note: *Section Comm 16.43 requires standby emergency power for a day care center multipurpose room with 2,000 square feet or more of area.*

Note: *Section Comm 16.42 (4) (a) 3 (16.45(4)) requires the power to exit lights to be supplied either in accordance with the National Electrical Code, section 700-12 or to be supplied from a separate switch or circuit breaker in a branch circuit panelboard with certain stipulations.*

COMM 60.39 SMOKE COMPARTMENTS. Smoke compartments as required by this chapter shall comply with the following:

(1) DESIGN. Smoke compartments shall be created by smoke barriers complying with s. COMM 60.40.

(2) EXITING FROM COMPARTMENTS. Each smoke compartment shall have access to at least 2 exits. At least one means of egress shall be an exit accessible immediately from each compartment. The second means of egress shall be permitted through adjacent compartments, but shall not require return through the compartment of fire origin.

COMM 60.40 SMOKE BARRIERS. A smoke barrier required by this chapter shall be designed to restrict the movement of smoke between compartments and shall comply with the following:

(1) GENERAL. A smoke barrier shall form an effective continuous barrier from outside wall to outside wall and from floor slab to floor or roof deck above, including continuity through all concealed spaces, such as the space above suspended ceilings, and including interstitial structural and mechanical spaces.

(2) RATING OF BARRIERS. A smoke barrier shall have a fire-resistive rating of not less than 1 hour.

(3) OPENINGS IN BARRIERS. Openings in smoke barriers shall be protected as specified in ss. Comm 51.048 and 51.049. Door openings in smoke barriers shall be protected with fire doors with a rating of not less than 20.

(4) PENETRATION OF BARRIERS.

(a) Except as specified in par. (b), penetrations in a smoke barrier shall comply with the requirements specified in s. Comm 51.049 and approved smoke dampers designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a smoke barrier wall. Approved combination smoke and fire dampers are permitted in lieu of a separate fire and smoke damper.

(b) Smoke dampers are not required where the building is provided with an engineered smoke control system.

(c) Structural framing may be continuous through or over the smoke barrier wall.

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Division of Safety & Buildings
APPROVAL FOR DAY CARE OCCUPANCIES
(9 or more children)

I. New Buildings Constructed for Day Care Use

A. Submit Plans according to Comm 50.12.

B. Plans will be reviewed for compliance with Chapters COMM 50, 51, 52, 53, 60, 63, and 64.

C. Field inspections will be provided as for other occupancies.

D. Obtain a license in accordance with the requirements of Health and Family Services.

II. Conversion of Existing Building from Other Use to Day Care Use

A. Contact a Consultant (Registered Architect or Engineer if building volume is over 50,000 cu. ft.and changes are expected or being considered. A certified commercial building inspector may also be used if no changes are being considered or expected or in any condition when the building volume is 50,000 cu. ft. or less) to determine the feasibility of this "Change of Use," making sure the consultant considers all codes (including, but not limited to, the "commercial building" code and the licensing codes).

B. Consultant performs the necessary inspections and informs the owner of all changes necessary to allow the day care use within the building.

1. If those changes require physical remodeling of the building or heating system:

a. Plans are created and submitted for approval in accordance with s. COMM 50.12.

b. Upon completion of the project, arrange to have the compliance statement completed and forwarded to this agency with a copy forwarded to the licensing agency for their use in issuing the license.

2. If those changes do not require physical remodeling (i.e., only smoke detectors are needed or only wiring needs upgrading) of the building or heating system:

a. The consultant forwards a copy of the report itemizing any shortcomings or corrections to the owner.

b. The owner makes any/all corrections outlined in the report.

c. The owner sends a copy of the report to the licensing agency, including statement verifying any/all corrections have been completed, for their use in issuing the license.

C. Licensing agency issues license once all rules of the licensing agency are met.

Chapter COMM 61

COMMUNITY-BASED RESIDENTIAL FACILITIES (CBRF) AND SHELTERED FACILITIES FOR BATTERED WOMEN

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COMM 61.001 SCOPE.

(1) CBRF SERVING 9-20.

(a) The requirements of this chapter shall apply to all community-based residential facilities, herein afterwards referred to as CBRF, providing care, treatment and services to 9 through 20 unrelated adults, to be located in existing buildings.

Please note that the scope of Chapter 61 is extremely limited. Chapter 61 applies only to CBRFs which are to be located in existing buildings and where that CBRF has a licensed capacity of 9 through 20 unrelated adults. If the CBRF is a new building or if the CBRF will have a licensed capacity in excess of 20 persons, the building will fall under the scope of Chapter COMM 57.

CBRFs with a licensed capacity of less than nine persons and located in existing buildings will be regulated by the Department of Health and Family Services and are exempt from the requirements of this code.

New buildings constructed with a licensed capacity of three to eight will fall under the scope of the Uniform Dwelling Code, Chapters COMM 20-25, thus plan submittal to the Dept. of Commerce is not required.

Note: Refer to Ch. HSS 82, rules of the department of health and social services for requirements pertaining to CBRF to be located in existing buildings providing care, treatment and services to 3 through 8 unrelated adults. Refer to Ch. COMM 57 for CBRF requirements for buildings containing more than 20 unrelated adults.

(b) Except for s. COMM 51.01, the requirements of chs. COMM 51 to 53 and 64 do not apply to existing conditions unless specifically referred to in this chapter. Additions, alterations and remodelings shall conform to the current applicable portions of these chapters.

(2) NEWLY CONSTRUCTED CBRF.

(a) All newly constructed CBRF providing care, treatment and services for 3 to 8 unrelated adults shall be within the scope of chs. COMM 20-25. (b) All newly constructed CBRF providing care, treatment and services for 9 or more unrelated adults shall be within the scope of ch. COMM 57.

Note 1: This code is not intended to limit the power of cities, villages and towns to make, or enforce, additional or more stringent regulations, provided the regulations do not conflict with this code, or with any other rule of the department or law.

Note 2: CBRF intending to utilize federal funds may have to comply with other requirements in addition to those outlined herein, such as NFPA 101/Life Safety Code, ANSI standards for barrier-free design, and miscellaneous federal regulations.

(3) SHELTERED FACILITIES FOR BATTERED WOMEN.

(a) The requirements of this chapter shall apply to all sheltered facilities for battered women, as specified in s. 46.95, Stats., serving 20 or less occupants.

(b) Except for s. COMM 51.01, the requirements of chs. COMM 51 to 53 and 64 do not apply to existing conditions unless specifically referred to in this chapter. Additions, alterations and remodelings shall conform to the current applicable portions of these chapters.

Shelter Facilities for Battered Women. *Although the State Statutes indicate that shelter facilities for battered women are not Community-Based Residential Facilities, the function of these occupancies does meet the community-based residential description in our code. Therefore, for construction and building code purposes, existing buildings being converted to shelter facilities for battered women, which accommodate 9 to 20 residents, will be reviewed under the provisions of Chapter COMM 61. New buildings constructed as shelter facilities for battered women, and buildings housing more than 20 occupants, will be reviewed under the provisions of Chapter COMM 57.*

(4) SHELTERS FOR THE HOMELESS. The requirements of this chapter shall apply to shelter facilities serving 20 or less occupants.

Note: Refer to ch. COMM 57 for sheltered facilities serving more than 20 occupants.

COMM 61.01 DEFINITIONS.

(1) AMBULATORY. Ambulatory means able to walk without assistance or difficulty.

(2) CAPACITY. The capacity for CBRF is that maximum number of residents as allowed by rules of the department of health and social services.

(3) CLASSES OF CBRF.

(a) *Class A.* Class A CBRF serve residents all of whom are ambulatory, capable of following directions and taking independent action for self-preservation under emergency conditions.

(b) *Class B.* Class B CBRF serve residents one or more of whom are semiambulatory or nonambulatory, but all of whom are mentally and physically capable of taking independent action for self-preservation under emergency conditions.

(c) *Class C.* Class C CBRF serve residents one or more of whom are not physically or mentally capable of taking independent action for self-preservation under emergency conditions.

(6) ELECTRICAL SERVICE. Electrical service means the conductors and equipment for delivering electrical energy from the supply system to and including the wiring system of the CBRF.

(7) EXISTING BUILDING. An existing building, for the purposes of this code (ch. COMM 61), is one which was constructed and occupied, or ready for occupancy, at least 24 months prior to the date of first application for licensure as a CBRF. Existing buildings which do not satisfy these requirements shall be considered new construction as specified in s. COMM 61.001 (2).

(7a) EXISTING BUILDING, CURRENTLY LICENSED. A facility licensed or certified within 24 months prior to the effective date of these rules (ch. COMM 61) is considered an existing building for the purposes of this code (ch. COMM 61).

(8) FLOORS AND STORIES.

(a) *Attic floor.* Attic floor containing habitable rooms and that are occupied shall be counted as a story.

(b) *Basement floor.* A basement is a floor level partially or totally below grade and not having any required exit for any floor level above it.

(c) *First floor.* The first floor is the lowest floor having one or more required exits for that floor and for any floor above or below it.

(9) HABITABLE FLOOR SPACE. Habitable floor space is the area of habitable rooms with a ceiling height more than 5 feet 6 inches, used for the purposes of sleeping, living, cooking or dining.

(10) HABITABLE ROOM. A habitable room is any room used for the purposes of sleeping, living, cooking or dining, excluding such places as closets, bath or toilet rooms, pantries, stairways, corridors, service rooms, laundries, utility rooms, cellars or basements unless finished for occupancy, storage spaces, foyers, unfinished attics, administrative offices, garages and similar spaces.

(11) NONAMBULATORY. Nonambulatory means not able to walk at all.

(12) OUTSIDE WINDOWS. Outside windows are windows which open directly to the out-of-doors or to unheated enclosed spaces, such as exterior balconies or sun porches.

(13) PRIMARY FUNCTION. Primary function is the basic or essential care, treatment or service provided to residents of the facility.

(14) SEMIAMBULATORY. Semiambulatory means able to walk with difficulty or able to walk only with assistance of aids, such as crutches, canes or walkers.

COMM 61.10 BUILDING CONSTRUCTION AND SITE.

(1) CONDITION OF BUILDING AND SITE. All buildings utilized as CBRF shall be structurally sound without visible evidence of structural failure or deterioration.

(a) All courts, yards, or other areas on the premises shall be properly drained or graded to divert water away from the building.

(b) Fences, other minor construction, driveways, parking areas and similar paved areas shall be properly maintained in a safe condition.

(c) Walks shall provide convenient all-weather access to buildings and shall be properly maintained in a safe condition.

(d) Exterior surfaces of buildings and structures not inherently resistant to deterioration shall be treated with a protective coating of paint or other suitable preservative which will provide adequate resistance to weathering.

Note: Any exterior surface treated with paint or other preservative shall be maintained so as to prevent chipping, cracking or other deterioration of the exterior surface or the surface treatment. All paint or other preservative shall be applied in a workmanlike fashion. Lead-based paint shall not be used.

(e) Every interior floor, wall and ceiling shall be kept in proper repair. Interior walls and ceiling in spaces subjected to moisture shall be provided with water-resistant, hard surfaces and shall have no serious surface irregularities or cracking.

Note: The use of "indoor-outdoor" carpeting, or other such carpeting approved for application on floors subjected to moisture, is acceptable.

(f) Every foundation wall, exterior wall, floor and roof shall be watertight, rodent-proof and reasonably weathertight, and shall be kept in proper repair.

(g) Every exterior window, exterior door and exterior basement hatchway shall be watertight, rodentproof and reasonably weathertight and kept in proper repair. Every interior door shall be kept in proper repair. All installed door and window hardware shall be maintained in proper working condition.

(h) Every inside and outside stair, every porch and every appurtenance to the building shall be so maintained as to be safe in use.

(i) Abrasive strips or nonskid surfaces to reduce or prevent slipping shall be used when slippery surfaces present a hazard.

(2) GARAGES AND ACCESSORY BUILDINGS. Garages and accessory buildings located on the same property with a CBRF shall comply with the following:

(a) A CBRF shall be separated from an attached storage garage or repair garage in accordance with s. COMM 51.08.

(b) *Detached garages.*

1. Detached garages shall be located a minimum of 3 feet 0 inches from the CBRF.

2. Detached garages less than 3 feet 0 inches from the CBRF shall comply with the requirements for attached garages as found in sub. (2) (a).

(c) *Detached accessory buildings.*

1. Detached accessory buildings in which fueled, motorized vehicles and appliances (snowmobiles, power lawn mowers, motorcycles, snow blowers and similar equipment) are stored shall be located a minimum of 3 feet 0 inches from the CBRF.

2. Detached accessory buildings in which fueled, motorized vehicles and appliances are stored, less than 3 feet 0 inches from the CBRF, shall comply with the requirements for attached garages as found in sub. (2) (a).

(3) SMOKE SEPARATION.

(a) A door shall be provided at any interior stair between the basement and the first floor. This door shall be provided with a latch and an automatic closing device and normally be kept closed.

The automatic closing device referenced by this section of the code can be a spring provided the spring has sufficient strength to close and latch the door.

(b) Any shaft (clothes chute, dumbwaiter, laundry chute and similar shafts) leading to the basement shall be provided with a door on each level above the lowest floor. The door shall be provided with a latch and an automatic closing device and shall normally be kept closed.

Note: A spring of sufficient strength to close the door and activate the door latch will be acceptable for meeting the automatic closing device portion of these requirements.

COMM 61.11 MINIMUM CLASS OF CONSTRUCTION.

Class of construction for CBRF shall comply with Table 61-I.

TABLE 61-I
MINIMUM CLASS OF CONSTRUCTION (s. COMM 51.03)

Number of Stories	Minimum Type of Construction for Class of CBRF		
	Class A	Class B	Class C
1	8	8	3(c), (d)
2	8	8(b), (c)	2(e)
3	5(a)	2(d)	2
4	5	2	2
5 to 8	2	2	2
Over 8	1	1	1

(a) Type 8 construction will be permitted if the basement is protected by a complete automatic sprinkler system or if all ceilings, including basements, are completely protected with 1/2-inch gypsum wallboard, or equivalent, and all stairway exits are interior stairs, one of which is completely enclosed, with at least one-hour rated construction, to a first-story outside exit.

(b) Type 8 construction will be permitted if building is protected by a complete automatic sprinkler system or if only ambulatory residents are permitted above the first story and in the basement.

(c) Types 5 and 6 construction will be permitted if of totally noncombustible construction.

(d) Type 8 construction will be permitted if building is protected by a complete automatic sprinkler system and provided only ambulatory residents are permitted above the first story and in the basement.

(e) Types 3, 5 and 6 construction will be permitted if of totally noncombustible construction and the building is protected by a complete automatic sprinkler system.

Note: The following brief descriptions of construction types are included as guidelines only. Designers and builders should refer to s. COMM 51.03 and Table 51.03-A for detailed descriptions and requirements for the various construction types.

Type 8 -- Wood framed walls, floors, roofs and partitions, including wood framed exterior walls faced with masonry veneers (typical residential construction).

Type 6 -- Metal framed walls and roofs with steel structural framing; sheet metal covered exterior walls and roof (typical pre-engineered metal building).

Type 5 -- Exterior walls entirely of masonry (concrete block, brick, concrete, etc.); floor and roof systems of wood, steel or concrete; interior partitions are wood framed. (Buildings with wood floor and roof systems or with wood framed partitions are not considered noncombustible.)

Type 3 -- Totally noncombustible building with floors, roof and structural framing protected with hourly rated fireproofing material.

Types 2 and 1 -- The same as Type 3 but with higher degrees for fireproofing.

COMM 61.12 EXITING AND DOORS.

(1) NUMBER, TYPE AND ACCESS TO EXITS.

(a) All CBRF, and each floor level having habitable rooms, shall have at least 2 means of exit which provide unobstructed travel to the outside at street or grade level.

1. Exception. A single exit will be permitted from basements or attics utilized for recreational, nonsleeping purposes only.

2. A wooden balcony or a flat roof, within 10 feet of grade, or an exterior wood stair may serve as one of the required exits from the second floor of a 2-story CBRF, except Class B and C CBRF with nonambulatory residents on the second floor.

(b) Exits shall be standard exits to grade (doors), stairways as specified in sub. (3), or fire escapes. (See exception under sub. (1) (a) 1.)

(c) No exit passageway shall be through a private room or bath/toilet room.

(d) Exit passageways and stairways to the outside exits shall be at least 3 feet wide, except existing secondary exit passageways, stairways and doors may be reduced to 2 feet 4 inches in width.

(e) The required width shall be maintained clear and unobstructed at all times.

(2) DOORS.

(a) Outside exit doors and doors in exit access corridors shall be at least 2 feet 8 inches in width, except as provided in sub. (1) (d) for existing secondary exit doors.

(b) All doors shall have such fastenings or hardware that they can be opened from the inside with one hand without the use of a key.

(c) Closet doors shall be openable from the inside.

(d) All interior doors equipped with locks shall be designed to permit opening of the locked doors from either side in case of emergency.

(3) STAIRS: GENERAL.

(a) *Treads and risers.* All required interior and exterior exit stairways shall have a minimum tread width (exclusive of nosing or projection) of 9 inches and a maximum riser height of 8 inches.

1. *Exception.* Stairs serving basements and attics without habitable rooms may have a minimum tread width (exclusive of nosing or projection) of 8 inches and a maximum riser height of 9 inches.

(b) *Handrails.* One or more handrails, at least 29 inches above the nose of the tread, shall be provided on all stairways. Handrails shall be provided on the open sides of stairways and platforms.

(c) *Winder stairs.*

1. Winders in stairways shall be provided with handrails on both sides, at least 29 inches above the nose of the tread.

2. Winders in stairways used as required exits shall have treads of at least 7 inches in width at a point one foot from the narrow end of the tread.

(d) *Spiral stairs.* Spiral stairs shall be prohibited for use as required exit stairs.

(4) STAIRS: ENCLOSURE.

(a) Three-story CBRF shall have at least one stairway exit, enclosed with at least one-hour rated construction, leading to a first-story outside exit.

(b) CBRF, 4 or more stories in height, shall have all stairways enclosed with at least one-hour rated construction. All required exit stairways shall have such enclosures leading to a first-story outside exit.

Note: Buildings of Type 1 and 2 construction require 2-hour rated stair enclosures in accordance with s. COMM 51.03 (1) and (2).

(5) ILLUMINATION. All exit passageways and stairways shall be capable of being illuminated at all times.

COMM 61.13 SIZES OF ROOMS.

(1) HABITABLE FLOOR SPACE.

(a) Each sleeping room for ambulatory residents shall contain not less than 60 square feet of habitable floor space; and each sleeping room for semiambulatory or nonambulatory residents shall contain not less than 90 square feet of habitable floor space.

(b) In addition to the area required in sub. (1) (a), the CBRF shall provide habitable floor space, other than sleeping rooms, of not less than 60 square feet of area for each ambulatory resident and of not less than 90 square feet in area for each semiambulatory or nonambulatory resident.

(c) All habitable rooms shall have an average ceiling height of not less than 7 feet 0 inches.

COMM 61.14 SMOKE DETECTION.

(1) GENERAL. All CBRF within the scope of this chapter shall be provided with an approved smoke detection system.

A smoke detection system is required. As the requirement is for a system, the detectors must be interconnected. Single station, stand-alone detectors will ***not*** *satisfy the requirements of this section.*

(2) TYPE OF SYSTEM. The smoke detection system specified in sub. (1) shall be at least a low voltage interconnected smoke detection system designed to protect the entire facility and capable of sounding an alarm throughout the facility or at a central location upon activation of any smoke detector.

(3) SMOKE DETECTOR LOCATION. At least 1 approved interconnected smoke detector shall be provided at the following locations:

(a) At the head of every open stairway;

(b) At the door leading to every enclosed stairway on each floor level;

(c) In every corridor, spaced not more than 30 feet apart and not further than 15 feet from any wall;

(d) In each common use room, including living rooms, dining rooms, family rooms, lounges and recreation rooms but not including kitchens; and

(e) In each sleeping room in which smoking is allowed.

(4) APPLICABILITY. The provisions of this section shall apply to all CBRF constructed on or after the effective date of this section and to those CBRF previously constructed.

Note: See s. COMM 51.245 for additional requirements pertaining to smoke detectors.

COMM 61.15 WINDOWS.

(1) MINIMUM SIZE. Every living and sleeping room shall have outside windows with a total glazed area of at least 10% of the floor area of the room. The openable area of such windows shall be equal to not less than 5% of the floor area of the room served.

(2) MINIMUM OPENING FOR SLEEPING ROOMS. At least one window in each sleeping room shall be openable from the inside without the use of tools and shall provide a clear opening of not less than 16 inches in the least dimension.

(3) STORM WINDOWS AND SCREENS. All windows serving habitable rooms shall be provided with storm windows in winter and openable windows serving habitable rooms shall be provided with insect-proof screens in summer.

(a) *Exception.* Insulated windows need not be provided with storm windows.

COMM 61.16 PRIVACY.

Privacy for sleeping rooms shall be provided by full-height partitions and rigid, swing-type room doors.

The intent of this rule is to provide privacy of the occupants of the sleeping rooms. Therefore, the partitions and doors must be constructed of materials and in a manner which will provide the occupants of the sleeping rooms with privacy.

COMM 61.17 SANITARY FACILITIES.

(1) TOILET ROOMS.

(a) A CBRF shall be provided with at least 2 separate toilet rooms which are accessible from public areas, such as nonsleeping areas, during all hours of operation.

(b) Toilet rooms shall be provided with locks to ensure privacy.

(2) SANITARY FIXTURES.

(a) *Minimum number provided.* A CBRF shall be provided with at least 2 water closets, 2 lavatories connected to hot and cold water and 2 bathtubs or showers connected to hot and cold water.

(b) *Determination of number provided.* The ratio of occupants to water closets and lavatories shall be not less than one water closet and one lavatory for each 8 occupants, or fraction. The ratio of occupants to bathtubs and showers shall be not less than one bathtub or shower for each 10 occupants, or fraction.

(3) ACCESSIBILITY. Toilet rooms shall be so located that the maximum vertical travel distance between toilet rooms and sleeping rooms shall be not more than one floor level.

Note: Also refer to ch. HSS 3--Community-based Residential Facilities, for additional requirements.

COMM 61.18 REQUIREMENTS FOR BARRIER-FREE ENVIRONMENT.

(1) SCOPE. The requirements of this section are intended to ensure that all CBRF licensed for mentally retarded or physically disabled residents shall be accessible and usable by such residents.

(2) DEFINITIONS.

(a) *Primary floor.* The primary floor is any floor level at least 50% of which is used for habitable floor space.

(3) REQUIREMENTS FOR ACCESSIBILITY. All CBRF shall comply with the requirements found in Table 61.18.

It should be noted that some of the requirements found in this portion of the code are not in alignment with ch. COMM 69/ADAAG. You are reminded where the two are in conflict, the more restrictive requirements should be met.

TABLE 61.18

Barrier-Free Requirements	Class of CBRF		
	A	B	C
Ramped or grade-level entrance from street, alley or ancillary parking to a primary floor	Not required	Not required[1]	Not required
Stepped entrance to a primary floor within 2'0" of grade	Not required	Required[1]	Not permitted
All passageway doors on primary floor minimum 2'-8" wide	Not required	Not required[2,3]	Required
All passageway doors on primary floor minimum 2'-6" wide	Not required	Required[2]	Not permitted[3]
Elevators, ramps or lifts to other floor levels	Not required	Required[4]	Required[4]
Interior access to all common-use areas	Not required	Required	Required
Interior access to at least one bathing and toilet facility	Not required	Required	Required
Grab bars for toilet and bath fixtures	Not required	Required[5]	Required[5]
Compliance with s. COMM 52.04 (8)	Not required	Required[6]	Required[6]

The reference to 52.04 (8) is intended to direct users to the usability criteria for toilet rooms. As this code section no longer applies, you should refer to COMM 69.35.

1 Ramped or grade-level entrance required if residents are not capable of negotiating stairs.

2 2'-8" doors required if residents in wheelchairs are allowed.

3 2'-6" sleeping room doors permitted for rooms used by ambulatory residents.

4 May be omitted if use of other floors is restricted to ambulatory or semiambulatory residents physically capable of negotiating stairs or if there are no one-of-a-kind, common-use areas located on those floors.

5 Not required in rooms used only by ambulatory residents.

6 Not required in rooms used only by ambulatory residents or residents not confined to a wheelchair.

(4) RAMP REQUIREMENTS. Ramps, as required in Table 61.18, shall comply with the following:

(a) *Ramp slope.* Ramps shall have a slope of not more than one foot of rise in 12 feet of run. An interior ramp with a slope of one foot of rise in 8 feet will be permitted. The ramps shall have a slip-resistant surface and shall have no side slope;

(b) *Ramp width.* Ramps shall be at least 4 feet wide, of which not more than 4 inches on each side may be occupied by a handrail;

(c) *Ramp handrails.* Ramps shall have a handrail on each side which shall be at least 2 feet 6 inches high (preferable height, 2 feet 8 inches). Handrails on unenclosed ramps shall include an intermediate parallel rail at mid height;

(d) *Ramp clearance.* Where ramps are provided to doorways, the ramp on each side of the doorway shall be level for a distance of 5 feet from the door; and

(e) *Ramp platforms.* Ramps having a 1:8 slope shall have a 5-foot long level platform at 16-foot intervals. Ramps having a 1:12 slope shall have a level platform at 30-foot intervals. Both types of ramps shall have a level platform at least 5 feet long where they turn and at least 5 feet of level clearance at the bottom of the ramps.

COMM 61.19 KITCHEN AND COOKING AREAS.

All CBRF shall have a kitchen or an area set aside for cooking and dining accessible from public (nonsleeping) areas. Kitchens or cooking areas shall be provided with one sink, in good working condition, connected to hot and cold water; utility service connections; and space for a stove and a refrigerator.

COMM 61.20 FIRE EXTINGUISHERS.

A portable, dry chemical fire extinguisher, with a minimum 2A, 10 B-C rating, shall be provided on each occupied floor level. On the floor containing the kitchen, the fire extinguisher shall be located in the kitchen or cooking area.

COMM 61.21 MAINTENANCE AND CLEANLINESS.

All CBRF, and all parts thereof, shall be maintained and kept in good repair, shall be kept clean, and shall also be kept free from any accumulation of dirt, trash or debris.

COMM 61.215 COMBUSTIBLE AND FLAMMABLE LIQUIDS.

Combustible and flammable liquids shall be isolated in accordance with ch. COMM 10.

COMM 61.22 BUILDING SERVICE EQUIPMENT.

Each gas line providing service piping connections for appliances shall have a separate shut-off (stop cock) for each appliance served.

COMM 61.23 POTABLE WATER AND PLUMBING.

Where a public water supply is available it shall be used to provide a continuing and adequate supply of potable water. When a public water system is not available the well, or wells, shall be approved by the department of natural resources. Water samples from an approved well shall be tested at the state laboratory of hygiene, or a state approved laboratory, at least annually. The water supply shall be bacteriologically safe prior to use.

Note: Refer to ch. COMM 82 for requirements pertaining to the plumbing system.

COMM 61.24 HEATING AND VENTILATING.

(1) HEATING.

(a) *General.* All occupied rooms in CBRF shall be provided with a permanently connected heating system.

(b) *Operation and maintenance.*

1. The heating system shall be maintained in a clean and safe condition. A minimum temperature, as specified in the licensing rules, shall be maintained in all CBRF.

2. Replacement equipment shall be of an approved type.

Note: The department recognizes listings of independent testing agencies such as American Gas Association (AGA) and Underwriters' Laboratories (UL).

(c) *Chimneys and breeching.*

1. Chimneys (masonry or factory-built) and breeching shall be kept in good repair and shall be of the type required for the type of connected heating equipment.

2. Every chimney shall be provided with an access panel to permit inspection and servicing.

(d) *Clearance to combustibles and combustible construction.* 1. Heating equipment shall be installed in accordance with the manufacturer's recommendations to provide minimum clearance. In the absence of manufacturer's recommendations, a minimum clearance of 36 inches shall be provided.

a. Exception: Existing installations providing less than 36 inches of clearance will be accepted if there is no physical evidence of problem (charring, etc.).

2. New combustible construction, such as partitions, shelving or storage lockers, shall not encroach upon the required clearance.

(e) *Safety features.*

1. All oil- and gas-fired equipment shall be provided with automatic controls that will shut off the fuel supply to the burner in case of ignition failure.

2. Fixed electric heating equipment shall be of a type equipped with safety and temperature controls.

3. Gas-fired fireplaces shall be provided with automatic controls that will shut off the fuel supply in case of flame-out and shall be properly vented.

4. Solid-fuel fireplaces shall be equipped with safety screen.

(f) *Space heaters.* Portable and fixed fuel-fired, and portable electric space heaters are prohibited in CBRF.

1. Exception. Fixed, gas-fired prevented wall heaters may be used.

(2) VENTILATION: GENERAL REQUIREMENTS.

(a) *Kitchen or cooking areas.* Kitchens or cooking areas shall be provided with at least one openable outside window, an exhaust fan vented to the outside, or a means of filtered mechanical air circulation.

(b) *Bath and toilet rooms.* Bath and toilet rooms shall have at least one openable outside window at least 2 square feet in area, or a mechanical or gravity exhaust vented to the outside, or an approved ductless exhaust fan.

COMM 61.25 ELECTRICAL.

(1) GENERAL.

(a) Every CBRF shall be supplied with electrical service, wiring, outlets and fixtures which shall be properly installed and shall be maintained in good and safe working condition.

(b) The electrical service shall be of the proper size to handle the load connected to it.

Note: As a guide to the owner/operator for determining the adequacy of existing electrical service, the habitable rooms should have electrical service capable of providing at least 3 watts per square foot of total floor area in addition to that provided for air conditioning, ranges, fixed electric heaters and motor-driven equipment Ihp or over.

(2) PROTECTION. The branch circuits shall be protected by S-type or equivalent safety type, tamper-proof fuses, or circuit breakers not to exceed the ampacity of the smallest wire size in the circuit.

(3) MINIMUM NUMBER OF FIXTURES AND OUTLETS. The minimum number of fixtures and outlets shall be as follows:

(a) Every lavatory, bathroom, kitchen or kitchenette, dining room, laundry room, and furnace room shall contain at least one approved ceiling or wall-type electric light fixture equipped with sufficient lamps or tubes to provide no less than 5 footcandles at the floor level at the center of room. Note: A switched outlet may be substituted for a ceiling or wall fixture in dining rooms; and

(b) Electric duplex outlet receptacles shall be provided as follows. (To determine room area, measurements shall be taken at room perimeter and shall include doors and door-alcoves.)

1. Living room, one per 75 sq. ft. of floor area or major fraction (minimum of 2).
2. Dining room, one per 75 sq. ft. of floor area or major fraction (minimum of 2).
3. Kitchen, one per 8 lineal feet or fraction of countertop and preparation area, including island-type areas. In addition, kitchens used for dining purposes, one per 75 sq. ft. of floor area or major fraction. Separate outlets shall be provided for refrigerators.

Note: Preparation areas include countertops and all other similar areas at counter height.

4. Bedroom, one per 75 sq. ft. of floor area or major fraction (minimum of 2).
5. Laundry, one.
6. Toilet rooms, one (may be part of wall fixture if 72 inches or less from floor).
7. Other habitable rooms, minimum of 2.

(4) OUTLET AND SWITCH LOCATIONS: EXPOSED WIRING.

(a) *Outlets.* Convenience outlets shall be located to discourage use of extension cords.

(b) *Switches.* Switches or equivalent devices for turning on one light in each room or passageway shall be located so as to conveniently control the lighting in the area.

(c) *Exposed wiring.* All temporary wiring and exposed, abandoned wiring shall be removed.

COMM 61.26 RETROACTIVITY.

The rules of this chapter shall apply to buildings with occupancies under the scope of this chapter now in existence and to buildings hereafter converted to use as a CBRF.

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Chapter COMM 62

SPECIALTY OCCUPANCIES

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COMM 62.001 SCOPE.

This classification includes all specialty occupancies as indicated in the scope of each subchapter of this chapter.

COMM 62.10 DEFINITIONS.

(1) "**Assembly seating facilities**" means structures including but not limited to, bleachers, grandstands and stadiums on which persons are seated for such purposes as entertainment, worship or deliberation.

(1m) "**Greenhouses**" means structures clad with light-transmitting material designed primarily for the purpose of cultivating plant life and used as public buildings or places of employment.

(2) "**Open parking structure**" means a structure with open areas in the exterior walls or ventilation shafts, or combination of both, as specified in s. COMM 62.21 used solely for the parking of passenger vehicles without any facilities for repairing or fueling of vehicles within the structure.

(3) "**Outdoor theater**" means a place of outdoor assembly used for the showing of plays, operas, motion pictures and similar forms of entertainment in which the audience views the performance from self-propelled vehicles parked within the theater enclosure.

(4) "**Permanent**" means in place for more than 180 consecutive calendar days.

(5) "**Repair garage**" means a structure as defined in s. COMM 59.01.

(6) "**Storage garage**" means a structure as defined in s. COMM 59.01.

(7) "**Tents**" mean portable, temporary shelters or structures, the covering of which is made of pliable material.

Subchapter I — Open Parking Structures

COMM 62.20 SCOPE.

This subchapter provides the minimum requirements for the design and construction of open parking structures as specified in s. COMM 62.10 (2).

COMM 62.205 CLASSIFICATIONS.

Open parking structures shall be classified as either ramp access or mechanical access types as follows:

(1) **Ramp access,** open parking structures employ a series of continually sloped floors or a series of interconnected ramps between floors permitting the movement of vehicles under their own power between the street level and parking areas; or

(2) **Mechanical access,** open parking structures employ fully automated parking machines, lifts, elevators or other mechanical devices for moving vehicles between the street level and the parking area, and in which public occupancy is prohibited above street level.

COMM 62.21 CONSTRUCTION REQUIREMENTS.

(1) **GENERAL.** Open parking structures shall be provided with open areas in the exterior walls or ventilation shafts, or a combination of both, on each level of at least 4% of the total floor area of that level, distributed on at least 2 exterior sides so as to provide cross ventilation.

The intent of this section is to provide cross ventilation to remove potentially explosive fumes as well as smoke in case of a vehicular fire. Therefore, the openings provided in the two walls must be located to provide that desired level of cross ventilation. Ventilation shafts serving below-grade levels must have a cross sectional area meeting the 4 percent of area served criteria and must be located to provide cross ventilation. If the ventilation criteria cannot be met, the structure will be classified as a storage garage under the scope of Chapter COMM 59 rather than an open parking structure.

(2) **MATERIAL.** All open parking structures shall be constructed of noncombustible materials.

Note: Structural components of open parking structures are subjected to corrosive and deteriorating elements. The designer should consider the effects of such elements and should consider the use of air-entrained concrete, concrete sealers and coatings, additional cover for reinforcing and other accepted engineering practices to protect the components.

(3) **FLOORS.** Floors shall be provided with drainage as specified in s. COMM 82.36.

COMM 62.22 SETBACKS.

Open parking structures may be erected without enclosing walls, except that enclosing walls of not less than 2-hour fire-resistive construction, as specified in s. COMM 51.04, shall be provided on all sides which are less than 10 feet from a property line between premises or any other building.

COMM 62.23 OCCUPANCY SEPARATIONS AND HAZARD ENCLOSURES.

Occupancies within the scope of this chapter shall be separated from other occupancies or uses in accordance with s. COMM 51.08. Hazards shall be enclosed in accordance with s. COMM 51.08.

See COMM 54.14 commentary.

This will require a 2-hour occupancy separation between open parking decks and any office, regardless of the size of the office. We will not, however, require a 2-hour occupancy separation between the open parking deck and the attendant booth used solely for collecting parking fees.

COMM 62.24 CONSTRUCTION, HEIGHT AND ALLOWABLE AREA.

(1) **CONSTRUCTION AND HEIGHT.** Open parking structures shall be of the type of construction and shall not exceed the height as specified in this section. The maximum floor area of any such structure shall not exceed that permitted for the corresponding type of construction and height as follows:

(a) Open parking structures of noncombustible zero-hour (NC-0) rating shall not exceed 70 feet in height or 700,000 square feet in total area.

(b) Open parking structures of noncombustible 2-hour rating or better shall not be limited in height or area per floor level. Exterior walls need not be rated, except as provided in s. COMM 62.22.

Note: Open parking structures in excess of 60 feet in height are exempt from the administrative rules and statutes requiring automatic fire sprinkler systems (see s. COMM 52.01 (1) and (2) and s. 101.14, Stats.).

COMM 62.25 CLEARANCE LIMITATIONS.

(1) PRINCIPAL VEHICLE AND PEDESTRIAN TRAFFIC AREAS. The clear height of each floor level in principal vehicle and pedestrian traffic areas shall be not less than 7 feet 0 inches.

Clearance Limitations. *The intent is to require the minimum 7 feet 0 inches clearance only in traffic lanes and in all areas normally used by the public to leave from and return to their vehicles. Be aware that ch. 69/ADAAG may have more vertical clearance requirements along vehicle access routes as well as at parking spaces for the disabled.*

(2) CLEARANCE SIGNS. Clearance limitation signs shall be prominently posted at all vehicle entrances.

Note: A lesser clear height may be permitted in mechanical-access open parking structures when approved by the department.

COMM 62.26 NUMBER, LOCATION AND TYPE OF PEDESTRIAN EXITS.

(1) NUMBER OF EXITS. Every open parking structure and every floor level thereof shall have at least 2 exits.

(2) DISTANCE TO EXITS. Additional exits shall be provided so that no part of the open parking structure will be more than 200 feet distant to the exit discharge grade or to a stair enclosure if the walls separating the stair from the open parking structure are of at least noncombustible one-hour (NC-1) rating or better and the enclosure is continuous to an outside exit.

Exit distance is measured from exterior exit doors and doors to stairways enclosed in accordance with COMM 51.18. Exit distance may not be measured to doors to stairways enclosed in accordance with COMM 62.27.

Note: In all cases, required exit stairs are required to be enclosed (see s. COMM 62.27). If the designer elects to increase the exit distance by measuring to the stair enclosure, the enclosure must have at least a noncombustible one-hour (NC-1) rating.

(3) LOCATION OF EXITS. Exits in all open parking structures shall be placed as far apart as practicable and so located that if any exit is blocked, some other exit will still be available from every part of the structure.

(4) TYPE OF EXITS. At least one-half of the exits required by this section shall be standard exits to grade, stairways or horizontal exits as specified in ss. COMM 51.15, 51.16 and 51.19, respectively. The other exits may be non-parking access ramps with a maximum slope of 1:8.

COMM 62.27 STAIRWAY ENCLOSURES.

Stair enclosures of NC-0 hour rating, or better, shall be provided for all required exit stairways, unless otherwise required to be rated.

Unless required to meet exit distance, the stairway enclosure required under this section of the code need not be rated and need not be extended to an exterior exit door.

Note: It is the intent of s. COMM 62.27 to require all required exit stairs to be enclosed. If the designer elects to measure the exit distance to the stair enclosure, the enclosure must be then rated. (See s. COMM 62.26 (2).)

COMM 62.28 PEDESTRIAN AND PERIMETER GUARDRAILS.

(1) PEDESTRIAN GUARDRAILS.

(a) Pedestrian guardrails, or equivalent, conforming to the requirements of s. COMM 51.162, shall be provided on all open sides of the structure on each level.

(b) Pedestrian guardrails as specified in s. COMM 62.28 (1) (a) shall be provided at changes of elevation within the structure where the clear vertical opening at the elevation change is one foot 6 inches or greater.

(2) PERIMETER GUARDRAILS.

(a) Perimeter guardrails shall be installed at the end of drive lanes and shall be designed for a minimum horizontal live load of 1000 pounds per lineal foot acting at 18 inches above the floor level.

(b) Perimeter guardrails shall be installed at the end of parking stalls and shall be designed for a minimum horizontal live load of 500 pounds per lineal foot acting at 18 inches above the floor.

COMM 62.29 ILLUMINATION AND EXIT LIGHTS.

(1) ILLUMINATION LEVELS. Minimum illumination levels at a horizontal plane 30 inches above the floor shall conform to the requirements of Table 62-I.

(2) EXIT LIGHTS. Every required exit from each floor shall be indicated by an approved exit sign as specified in s. COMM 51.15 (5).

TABLE 62-I
MINIMUM ILLUMINATION LEVELS

Area	Intensity (in foot-candles)
Stairways and exits	10
Parking areas	2

COMM 62.30 STANDPIPES.

(1) FIRE DEPARTMENT STANDPIPES. Fire department standpipes shall be provided in all open parking structures 3 or more stories in height.

Please see the discussion regarding standpipes under COMM 59.23.

(a) Fire department standpipes shall be dry standpipes systems.

(b) Fire department standpipes with a fire department connection greater than 50 feet to a street shall be interconnected to a standpipe system with such a connection 50 feet or less to a street.

(c) Fire department standpipes shall be provided in each stair enclosure and shall be provided with approved 2 1/2-inch valve hose connections at each floor level with one connection in the stair enclosure and one connection immediately outside the enclosure.

(d) Fire department standpipes shall be as specified in s. COMM 51.21 (3) (e) to (i).

(2) EXCEPTIONS.

(a) The department will recognize alternative systems and designs if an equivalent degree of safety is provided in lieu of required fire department standpipes in open parking structures 60 feet or less in height.

(b) The department will accept open parking structures without fire department standpipes if clearances are provided to allow fire-fighting vehicles access throughout the open parking structure.

COMM 62.31 SANITARY FACILITIES.

(1) UNATTENDED PARKING STRUCTURES. Sanitary facilities need not be provided in unattended parking structures.

(2) ATTENDED PARKING STRUCTURES. Sanitary facilities for employes at attended parking structures shall be provided in accordance with s. COMM 54.12 (1)(a) 3.

Note: Sanitary facilities for parking patrons need not be provided.

COMM 62.33 EXCEPTIONS FOR MECHANICAL ACCESS OPEN PARKING STRUCTURES.

Mechanical access open parking structures need not comply with ss. COMM 62.25 - 62.29, inclusive.

COMM 62.34 BARRIER-FREE REQUIREMENTS.

(1) PARKING SPACES. Accessible parking spaces shall be provided in accordance with the applicable requirements specified in s. COMM 52.04 (3) (a).

Barrier-Free Requirements. *Parking structures must be designed to accommodate the physically disabled. See COMM 69 for required number of accessible stalls.*

(2) TOILET FACILITIES. Toilet facilities provided for the employes, as specified in s. COMM 62.31 (2), shall comply with the requirements of s. COMM 52.04 (4) (c).

Subchapter II — Television and Radio Transmitting and Receiving Antenna

COMM 62.35 SCOPE.

The requirements of this part shall apply to the outdoor portion of all apparatus, more than 12 feet in height, used for transmitting and receiving television or radio waves.

COMM 62.36 CONSTRUCTION REQUIREMENTS.

All television and radio antenna systems, including the supporting tower or mast, shall be constructed of galvanized steel or other corrosive-resistant noncombustible material. Where approved by the department, towers constructed of wood or wood poles set in the ground may be used to support antenna systems, but no wood tower or wood pole may be mounted on the roof of any building structure.

Plan submission is required for any ground mounted antenna structure exceeding 50 feet in height and located nearer to any street, public throughfare or property line than the height of the structure.

Plan submission is required for the installation of any roof mounted antenna structure exceeding 20 feet in height above the roof.

Any antenna and supporting towers exceeding 200 feet in height must be prepared, signed and sealed by a Wisconsin registered architect of engineer. Plans must be submitted.

COMM 62.37 DESIGN LOADS.

(1) DEAD AND ICE LOADS. The supporting tower shall be designed for the dead load of the structure and all appurtenances plus an ice load of at least 1/2 inch in radial thickness. The ice load shall be considered on all members of the structure including guys.

(2) WIND LOADS.

(a) Self-supporting towers shall be designed for the wind loads specified in s. COMM 53.12.

1. Open face or latticed tower structures shall be designed for wind pressure applied to the projected area of all members, including ice, in one face multiplied by the following factors:

a. 1.75 for towers of square cross section; or

b. 1.5 for towers of triangular cross section.

2. Wind loads shall be considered basic design loads with no increase in allowable unit stresses permitted.

(b) Guyed towers shall be designed in accordance with a recognized engineering standard.

Note: "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures," EIA Standard RS-222-C, published by Electronic Industries Association, 2001 Eye Street, N.W., Washington, D.C. 20006, is an acceptable standard for the design of guyed towers and self-supporting towers.

The above states that the EIA Standard RS-222-C is an acceptable standard for the design of antenna towers. A revised Standard EIA-222-D has been published with an effective date of June 1, 1987.

In the RS-222-C Standard, wind pressures are specified by "Wind Loading Zones." A map indicates two zones (A & B) for the state. A listing by counties is provided to determine the appropriate zone. When using the EIA-222-D Standard, it is necessary to specify a "Basic Wind Speed." A map is provided showing wind speed contours for a 50-year recurrence. For any location in the state, the wind speed may be interpolated between contours representing 70, 80, and 90 mph. Design for a basic wind speed of more than 90 mph will not be required.

The department will accept designs based on either of these standards, except as follows:

The wind load expressed in psf occurring simultaneously with 1/2-inch radial ice load may be reduced 25 percent for self-supporting (free standing) and guyed towers. (This is equivalent to 87 percent of the basic wind speed.) This reduction will be permitted for designs based on either of the EIA standards.

The previously permitted 50 percent reduction on wind load occurring simultaneously with 1/2-inch radial ice load for guyed towers is not consistent with either EIA standard and is to no longer be utilized.

Wind loads shall be considered basic design loads with no increase in allowable unit stresses permitted. This is an exception to the provisions of EIA-222-D, section 3.1.1.

COMM 62.38 ANTENNA SYSTEMS ON BUILDINGS.

Antenna systems installed on the roof of a building shall not be supported by or attached to a chimney. All such installations shall be mounted on an independent platform or base and anchored in place. The platform or base of the tower shall be sized to distribute the weight of the structure so the roof construction will safely support the weight of the structure in addition to the required live and dead roof loads.

COMM 62.39 SETBACKS.

No wires, cables, or guy wires shall extend over any street or other public thoroughfare or over any electric power or communication lines.

COMM 62.40 ANTENNA SYSTEM SUPPORT.

Poles used for electric power or for communication lines may not be used for supporting or for guying any antenna system.

This prohibition only applies to single-member, typically wood, poles not to multi-member towers.

COMM 62.41 ELECTRICAL REQUIREMENTS.

Electrical installations in connection with antenna systems, including the grounding of the tower or mast, shall comply in all respects with the requirements of the Wisconsin state electrical code, volume 2, ch. COMM 16.

Subchapter III — Tents

COMM 62.42 SCOPE.

The requirements of this part shall apply to all tents, except those used exclusively for construction purposes.

Tents are defined as temporary structures that are in place 180 days or less and are exempt from plan submittal to the state, but must comply with the following. Also, S&BD will generally waive plan review of longer-term polyethylene-covered greenhouses due to the ease with which an occupant may exit through the polyethylene film at any point in case of an emergency. More substantial fabric covered structures of a permanent nature must be reviewed as buildings under the appropriate occupancy chapter. They would be subject to the plan submittal and design requirements of Ch. 50.

COMM 62.43 AREA LIMITATION AND SETBACKS.

(1) AREA OF GROUND COVERED. No tent shall be erected to cover more than 75% of the premises on which it is located.

(2) SETBACK TO PROPERTY LINE AND OTHER STRUCTURES.

(a) Tents used for assembly purposes which cover 1500 square feet or more of ground area shall be located at least 20 feet from any other structure or adjoining property lines.

(b) Concession and other tents not used for assembly purposes need not be separated from each other and may be located less than 20 feet from other structures.

(3) SETBACK FOR EXITING. Stake lines of adjacent tents used for assembly purposes shall be sufficient distance from each other to provide an emergency exit passageway not less than 6 feet in width between stake lines. Proper protection shall be provided along such stake lines to eliminate tripping hazards.

COMM 62.44 STRUCTURAL REQUIREMENTS.

(1) MATERIAL SIZE AND STRENGTH. Poles and other members supporting tents shall be of sufficient size and strength to support the structure safely without exceeding the stresses specified in ch. COMM 53.

(2) WIND LOAD.

(a) All tents shall be adequately guyed, supported and braced to withstand a wind pressure or suction of not less than 10 pounds per square foot.

(b) The poles, guys, stakes, fastenings and similar devices shall be of sufficient strength and so attached as to resist a wind pressure of at least 20 pounds per square foot of projected area of the tent.

COMM 62.45 FLAME RESISTANCE.

All tents used for assembly purposes or in which animals are stabled and all other tents used by the public in places of outdoor assembly shall be effectively flameproofed. The owner shall furnish a certificate or a test report by a recognized testing engineer or laboratory as evidence that such tents have the required flame resistance.

COMM 62.46 FIRE HAZARDS.

(1) CLEARING OF GROUND. The ground enclosed by an tent used in connection with a place of outdoor assembly and for a distance of not less than 10 feet outside such structure on all sides shall be cleared of all flammable material or vegetation which will transmit fire. The premises shall be kept free from such flammable material during the period the premises are used by the public.

(2) COMBUSTIBLE MATERIAL FOR CARE OF ANIMALS. No hay, straw, shavings or similar combustible materials other than that necessary for the current feeding and care of animals shall be permitted within any tents used for public assembly except that sawdust and shavings may be used if kept damp.

(3) NO SMOKING. No smoking or unapproved open flame of any kind shall be permitted in any tent while occupied by the public. "No Smoking" signs shall be conspicuously posted in all tents open to the public.

(4) SAFETY FILM. Tents shall not be used for motion picture performances unless safety film is used.

(5) COMBUSTIBLE AND FLAMMABLE LIQUIDS. Combustible and flammable liquids shall be isolated in accordance with ch. COMM 10.

COMM 62.47 EXITS.

(1) NUMBER OF EXITS.

(a) Every tent occupied by the public shall have at least 2 standard exits located at or near opposite ends of the structure.

(b) In tents used for assembly purposes, exits shall be provided on 3 sides if the capacity exceeds 600 persons and on 4 sides where the capacity exceeds 1,000 persons.

(2) EXIT DISTANCE. Exits shall be uniformly distributed but in no case shall the line of travel to an exit be greater than 150 feet.

(3) EXIT WIDTH. The total width of exits from a tent used for assembly purposes shall be not less than 44 inches per 100 persons. Exit openings shall comply in all respects with the requirements of ss. COMM 51.15 and 55.10.

COMM 62.48 TOILET FACILITIES.

Separate toilet facilities, in conjunction with all tents used as places of outdoor assembly, shall be provided in accordance with s. COMM 55.32. Toilet rooms and equipment shall comply with the requirements of ss. COMM 52.50-52.64 of this code or as approved by the department.

COMM 62.49 ELECTRICAL INSTALLATIONS.

(1) GENERAL. Electrical systems in all tents used as places of outdoor assembly shall be installed in accordance with the requirements of the Wisconsin state electrical code, volume 2, ch. Comm 16. All such systems shall be maintained and operated in a safe and workmanlike manner.

(2) PROTECTION AND ISOLATION. The electrical system and equipment shall be isolated from the public by proper elevation and guarding. All electrical fuses and switches shall be installed in approved enclosures. Cables laid on the ground or in areas traversed by the public shall be placed in trenches or protected by approved covers.

COMM 62.50 FIRE EXTINGUISHERS.

(1) GENERAL. Portable fire extinguishers shall be installed as specified in Table 62.50.

TABLE 62.50

Basic Minimum Extinguisher Rating	Area to be Maximum Travel Distance to Extinguisher (feet)	Protected per Extinguisher (sq. ft.)
1A	75	3,000
2A	75	6,000
3A	75	9,000
4A or larger	75	11,250

(2) LOCATION.

(a) Extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of fire.

(b) Extinguishers shall not be obstructed or obscured from view.

(3) MAINTENANCE. Portable fire extinguishers shall be maintained as specified in s. COMM 51.22.

COMM 62.51 ILLUMINATION; EXIT LIGHTS AND SIGNS.

(1) LIGHTING OF EXITS. All exits, aisles and passageways leading to exits in tents used as places of outdoor assembly shall be kept adequately lighted at all times when the structure is occupied by the public. Artificial illumination having an intensity of not less than 2.5 foot-candles at the floor line shall be provided when natural light is inadequate.

(2) ILLUMINATED EXIT SIGNS. Exit lights and signs complying with the requirements of s. COMM 55.11 shall be provided in all tents used as places of outdoor assembly where more than 100 persons can be accommodated.

Subchapter IV — Outdoor Theaters

COMM 62.52 SCOPE.

The requirements of this part shall apply to all outdoor theaters now in existence and to outdoor theaters hereafter constructed, except as provided in s. COMM 62.56.

COMM 62.53 ENTRANCES AND EXITS.

All entrances and exits for outdoor theaters shall comply with the regulations of the department of transportation for driveways from property abutting state highways and the following additional requirements:

(1) NUMBER OF ENTRANCES. Not more than one entrance shall be provided for each access road but each such entrance may be divided into 2 roadways and channelized to properly provide for vehicles turning right or left from the highway.

(2) HIGHWAY RIGHT-OF-WAY. That portion of an entrance or exit lying within the highway right-of-way shall comply with the regulations of the authority in charge of the maintenance of the highway or, in the event this authority has no regulation, it shall comply with regulations prescribed by the state department of transportation.

(3) NUMBER OF EXITS. Not more than one exit shall be provided for each access highway but such exit may be suitably channelized to provide for right and left turns to the highway, and not more than one traffic lane shall be permitted for each traffic lane on the highway available to vehicles leaving the theater.

COMM 62.54 VEHICLE STORAGE.

(1) AREA NEEDED. A storage area for vehicles, equal to not less than 10% of the theater capacity, shall be provided between the highway and the ticket booth. In all cases, sufficient storage space shall be provided so the vehicles will not back up on the traveled way of the highway. Storage area shall be calculated on the basis of 162 square feet per vehicle.

(2) HOLD-OVER AREA. A hold-over storage area having sufficient capacity to accommodate not less than 15% of the theater capacity shall be provided between the ticket booth and the ramp area.

COMM 62.55 TOWER CONSTRUCTION.

The tower supporting the motion picture screen shall be designed to resist a horizontal wind pressure of not less than 30 pounds for every square foot of exposed surface.

COMM 62.56 LOCATION OF TOWER.

The screen shall be so oriented that the picture is not visible from any major highway. This requirement does not apply to towers erected prior to January 1, 1952.

COMM 62.57 CONCESSION AND MOTION PICTURE MACHINE BOOTH.

(1) MOTION PICTURE BOOTH. The motion picture booth and equipment shall comply in all respects with the requirements of ss. COMM 55.40 through 55.49.

(2) CONCESSION BUILDINGS. Concession buildings in connection with outdoor theaters shall comply with the requirements of ch. COMM 54.

COMM 62.58 SANITARY EQUIPMENT.

(1) NUMBER OF FIXTURES REQUIRED. Outdoor theaters and other occupancies under this chapter shall be provided with separate toilet rooms for each sex. Toilet rooms and equipment shall comply with the requirements of ss. COMM 52.50 through 52.64.

(2) SANITARY FIXTURES. Toilet fixture ratios shall be provided as required by s. COMM 55.32. In determining the number of fixtures required for toilet rooms in connection with outdoor theaters, the capacity of the theater shall be established by using 2 1/4 persons for each vehicle accommodated, exclusive of vehicles parked in the waiting or hold-over area. The total number of persons will be considered equally divided between men and women.

(3) ACCESSIBILITY. Where toilet rooms are provided for the public and are so located that the patrons must cross a ramp area in order to reach the toilet rooms, a suitable approach or passageway leading to the toilet rooms shall be maintained. Such passageways shall be properly lighted and unobstructed.

COMM 62.59 RAMPS AND SPEAKER EQUIPMENT.

(1) **RAMP SPACING.** Ramps shall be spaced not less than 38 feet apart. The ramps shall be so designed that any vehicle can move from its parked position to the exit driveway without being required to back up.

(2) **SURFACE REQUIRED.** All ramps, parking areas, entrance and exit driveways shall be properly surfaced with a gravel surfacing or better, adequate to withstand the weight of the vehicles accommodated.

(3) **PUBLIC TRANSPORTATION SPEAKER FACILITIES.** Where additional seating space is provided in the theater enclosure for patrons using public transportation facilities, the speaker arrangement shall be such that the sound will be confined to the immediate seating area and not broadcast beyond the theater enclosure.

(4) **SPACING OF SPEAKER POSTS AND ELECTRICAL WIRING.** There shall not be less than 18 feet distance between speaker posts, measured parallel to the ramps, except in seated areas for patrons using public transportation. All electrical wiring and electrical equipment shall be installed in accordance with the provisions of the Wisconsin state electrical code, volume 2, ch. Comm 16. Each speaker post shall be wired with wire approved for underground use laid in trenches not less than 12 inches in depth.

COMM 62.60 LIGHTING.

All entrance and exit driveways shall be adequately lighted and properly marked to avoid congestion and confusion and shall remain lighted throughout the performance and until the audience has left the area.

COMM 62.61 SPEED LIMIT.

In every outdoor theater, notices of a permanent character shall be prominently displayed designating the maximum speed limit permitted for cars driven within the area. Parking lights shall be used when cars moving in the theater enclosure.

COMM 62.62 RUNNING OF ENGINES.

At each performance, an instructive trailer shall be shown on the screen informing the patrons of the danger of carbon monoxide poisoning when the engine is running and stating that when it becomes necessary to run the engine, the windows of the vehicle should be opened at least one inch.

Subchapter V — Assembly Seating Facilities

COMM 62.70 SCOPE.

The requirements of this subchapter apply to all assembly seating facilities and stadiums intended primarily to support persons for the purpose of spectator seating.

It is not necessary to submit to the state for review and approval the structural plans for bleacher components having five or less rows. However, the design and construction of such bleachers must be in accordance with acceptable engineering standards and capable of supporting the intended loads. The fact that the structural review for bleachers of five or less rows is not required does not mean they can be installed within a building when the approved building plans do not show the location and limits of the bleachers to be installed.

Plans for bleachers having more than five rows must be submitted for review and approval and the plans must be signed, sealed and dated by a Wisconsin registered architect or engineer.

COMM 62.71 APPROVAL AND SUPERVISION.

(1) APPROVAL OF PLANS. Plans and specifications shall be submitted to the department in accordance with the applicable provisions of ch. COMM 50. The following information shall also be included with each submittal:

(a) A plot plan for outdoor seating facilities showing location of facility relative to property lines and adjacent buildings or structures on the same premises; or a floor plan for indoor seating facilities showing location of seating relative to all required exits, aisles and passageways;

(b) Location and size of all structural members, seating area and number of seats, aisles and guardrail assemblies and number and spacing of all rows; and

(c) Structural calculations or a test report made by an independent testing agency and certified by a Wisconsin registered architect or engineer showing that the dead and live load in the open or partially open position and dead load in the closed position can be safely carried by the supporting structure.

1. Exception. The information specified in this paragraph need not be submitted if the seating facility has been granted a materials approval as specified in sub. (2).

(2) APPROVAL OF DESIGN. The design of each type or model of a seating facility may be approved by the department prior to installation for designs that are structurally repetitive in nature.

Note: See s. COMM 50.19 for further information.

(3) INSTALLATION SUPERVISION.

(a) The installation of all permanent seating facilities having more than 5 rows in height shall be erected under the supervision of a Wisconsin registered architect or engineer.

(b) Every temporary seating facility shall be inspected for proper erection in accordance with the manufacturer's instructions prior to initial public occupancy.

COMM 62.72 INSPECTION AND MAINTENANCE.

Every seating facility shall be inspected at least annually. Any loose connections, defective or broken members shall be repaired before the facility is used. All repairs and maintenance shall conform with the provisions of chs. COMM 50-64.

COMM 62.73 DESIGN LOADS.

(1) DEAD LOADS. All seating facilities shall be designed and constructed to support the actual dead weight of all component members.

(2) LIVE LOADS. All seating facilities shall be designed and constructed to support the superimposed minimum live loads specified in Table 62.73. In every case where the live load is greater than the minimum, the actual load shall be used. The most severe distribution, concentration and combination of design loads and forces shall be taken into consideration.

TABLE 62.73
MINIMUM STRUCTURAL LOADINGS

Component or Load Orientation	Load*
Vertical loads:	
Seating structure with load applied over the horizontal projected area	100 PSF
Seats and footboards	120 PLF
Seating platforms	100 PSF
Nonseating areas, such as aisles and passageways	100 PSF
Sway loads in combination with vertical loads:	
Acting parallel to seating	24 PLF
Acting normal to seating, such as front to rear and rear to front	10 PLF
Wind loads in combination with live, dead and sway loads:	
Vertical projected area when occupied	15 PSF
Vertical projected area when unoccupied	30 PSF
Guardrail loads:	
All rail members with load acting vertically and horizontally	50 PLF
Floor and ground loadings:	
Floors supporting seating facilities	See Table 53-I
Ground supporting seating facilities	See ch. COMM 53-Part II

* PSF = Pounds per square foot PLF = Pounds per linear foot

(3) PARTIAL LOADING.

(a) Except as provided in par. (b), structural members in which the stresses are greater under a partial loading than under full loading shall be designed to meet the conditions of greatest stress.

(b) Allowable stresses due to dead and live loads combined with either the wind or sway load or both, may be increased 33 1/3% provided the structural capacity of the component used is not less than that required for dead and live loads alone.

(4) ANCHORAGE LOADS. Folding or telescoping seating facilities that are attached to a floor or wall shall be anchored to withstand all impact loads in addition to the required live and dead loads.

(5) STRUCTURAL MEMBER OMISSION. All seating facilities shall be designed and manufactured so that if any structural member essential to the strength and stability of the structure is omitted during erection, the absence of such unused member will be self-evident.

(6) FOUNDATIONS, BASE PLATES AND MUDSILLS.

(a) Where provided, foundations for seating facilities shall comply with the requirements of ch. COMM 53, Part II.

(b) Mudsills of approved material sized to prevent settlement shall be provided when seating facilities rest directly on the ground. All bearing surfaces between mudsills and base plates shall be in full contact with each other.

COMM 62.74 CONSTRUCTION REQUIREMENTS.

(1) AREA LIMITATIONS.

(a) *Combustible construction.* Seating facilities constructed entirely of combustible construction shall not exceed 10,000 square feet in ground area or 200 feet in length.

When applying area limitations and type of construction, bleacher sections located within 10 feet of each other are considered a single bleacher. The lowest class of construction of the sections will be applied to all of the bleacher sections. Once the allowable area has been reached, future bleacher additions must be located at least 10 feet away. Also note the requirements of COMM 55.07 (3).

(b) *Partially noncombustible construction.* Seating facilities shall not exceed 20,000 square feet in ground area or 400 feet in length when constructed of any of the following:

1. Noncombustible framing and combustible seatboards or footboards;
2. Entirely of fire retardant treated wood; or
3. Entirely of members conforming to dimensions for heavy timber construction as specified in s. COMM 51.03 (4).

(c) *Noncombustible construction.* Seating facilities constructed of totally noncombustible construction shall not be limited in ground area or length.

(2) HEIGHT LIMITATION.

(a) *Combustible construction.* Seating facilities constructed entirely of combustible materials shall not exceed 20 feet above the ground or floor.

(b) *Noncombustible construction.* Seating facilities constructed of totally or partially noncombustible construction shall not be limited in height.

(c) *Within tents.* The highest level of seat platforms of any portable seating facility within a tent shall not exceed 12 feet above the ground or floor.

(d) *Folding or telescoping.* The highest level of seat platforms of any folding or telescoping seating facility not attached to a wall shall not exceed 12 rows or 11 feet above the floor, whichever is lower.

(3) CLEARANCE LIMITATIONS. A minimum of 7 feet vertical clearance shall be provided between any platform, seatboard or footboard and any ceiling or projection beneath the ceiling.

(4) LOCATION AND SETBACK. Outdoor seating facilities shall be located at least 10 feet from any other building or adjoining property line unless the exterior walls of such adjacent building are of one-hour fire-resistive construction or better and all openings therein are protected with fire-resistive doors and windows as specified in ss. COMM 51.047 and 51.048.

(5) BARRIER-FREE REQUIREMENTS. Permanent, elevated seating facilities such as bleachers and grandstands shall provide accessible seating in accordance with the applicable requirements in ch. COMM 69.

COMM 62.75 MEANS OF EGRESS.

(1) TYPE OF EXITS.

(a) Except as provided in par. (b), all required exits from any part of a seating facility shall be doorways, stairways or ramps conforming to the requirements specified in ss. COMM 55.08 through 55.10.

(b) Doorways, stairways and ramps are not required for assembly seating facilities when aisles are not required.

(2) NUMBER OF EXITS.

(a) *Outdoor seating.* Every outdoor seating facility, and every balcony or tier considered separately, shall be provided with at least 2 exits located as remote from each other as practicable and leading directly to the outside at grade. If the capacity of any such facility, balcony or tier exceeds 1,000 persons, there shall be at least 3 exits and where the capacity exceeds 4,000 persons, there shall be at least 4 exits.

(b) *Indoor seating.* The number of exits for every indoor seating facility shall comply with the requirements as specified in s. COMM 55.07.

(3) DISTANCE TO EXITS. Exits shall be distributed uniformly to prevent congestion and shall be so located that the line of travel to an exit or to a street, alley or open court is not greater than 150 feet.

(4) AGGREGATE WIDTH OF EXITS.

(a) *Outdoor seating.* The total clear width of exits from any outdoor seating facility shall be not less than 22 inches for each 500 persons, or fraction thereof.

(b) *Indoor seating.* The total clear width of exits off of any indoor seating facility shall be not less than 22 inches per 100 persons, or fraction thereof. The required exit width of the room and building shall be determined under the specific occupancy chapter and s. COMM 51.15.

The 22-inch/100 person exit width indicated in COMM 62.75 (4) applies only to the aisles and exit paths within the perimeter of the bleachers. It does not apply to the exit width from the room in which the bleachers are located nor from the building. Exit width requirements from the room and building are determined by s. COMM 51.15 (6).

(5) EXIT LIGHTS AND SIGNS. Exit lights and signs shall comply with the requirements as specified in s. COMM 55.11.

(6) AISLES REQUIRED.

(a) Except as provided in par. (b), aisles shall be required in all seating facilities.

Question: *Can a bleacher system using contoured or sculptured seatboards be constructed without aisles under s. COMM 62.75 (6)(b)?*

Answer: *No. The exception was first introduced into the 1942 Building Code under Chapter 55, Assembly Halls. At that time bleachers or grandstands, without backrests, were constructed with the seatboard being made of the same material as the footboard with an equivalent walking surface. Contoured seating was introduced several years after this. Contoured seating does not provide the same flat and level surface as a footboard, nor does the contoured seat provide the same slip-resistance as a ribbed aluminum or wood surface. The five conditions specified under s. COMM 62.75 (6)(b) were based on the understanding that the seatboards were flat, similar to other walking or stair surfaces.*

(b) Aisles may be omitted provided all of the following conditions exist:

1. Seats are without backrests;
2. The rise between rows does not exceed 12 inches;
3. The number of rows does not exceed 20 for outdoor seating facilities or 16 for indoor seating facilities;
4. The row spacing does not exceed 28 inches; and

5. The first seatboard is not more than 20 inches above the ground or floor.

(7) AISLE WIDTH. Aisles having seats on both sides shall be not less than 42 inches in width and aisles having seats on one side only shall be not less than 36 inches wide.

(8) AISLE LOCATION.

(a) *Outdoor seating.* For seating not within a building, the number of seats between any seat and an aisle shall not be greater than 20 when the seats are without backrests and 11 when the seats have backrests.

(b) *Indoor seating.* Except as provided in par. (c), the number of seats between any seat and an aisle for seating within a building shall not be greater than 9 when the seats are without backrests and 6 when the seats have backrests.

(c) *Continental seating.* The number of seats between any seat and an aisle may be increased to 49 where:

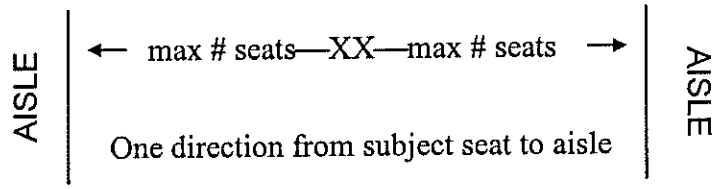
1. A minimum unobstructed passage of 22 inches is provided between rows of unoccupied seats; and

2. The unobstructed passage between rows leads to a side aisle on each end of the rows where exit doors are located at no more than 20 foot intervals leading to an exit corridor or exit court.

Question: *COMM 62.75 (8) specifies the maximum number of seats between any seat and an aisle. What is the correct way to apply this section?*

Answer: *The key words in this code section are* ***"between"*** *and* ***"an"****.*

The intent of the code is to limit the travel distance within a row of seats to ***an*** *aisle.* ***"An"*** *infers a measurement to a single aisle, not to both aisles. The code also specifies a maximum number* ***between*** *any seat and an aisle, thus the seat being evaluated is not included in the number of seats to the aisle. Thus, the diagram below indicates the correct application of the code.*



The specific number of seats which may be placed between two aisles are as follows:

COMM 62.75 (8)(a) Outdoor seating without backrests - 42

Outdoor seating with backrests - 24

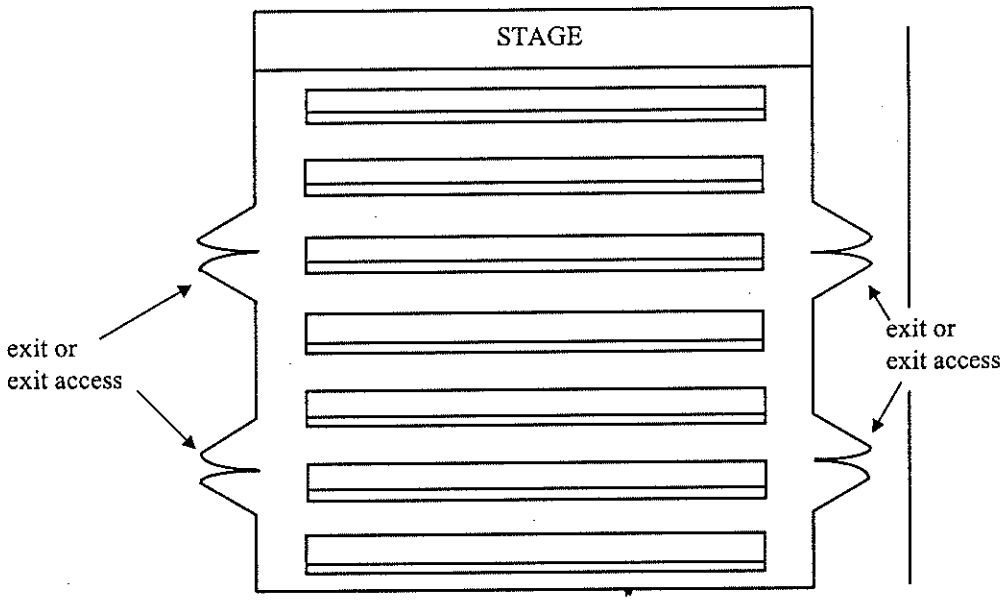
COMM 62.75 (8)(b) Indoor seating without backrests - 20

Indoor seating with backrests - 14

COMM 62.75 (8)(c) Continental seating - 100.

The distinction between continental seating should also be made. Continental seating is a seating design which makes it possible to evacuate a large number of people efficiently (a) by having a wider space between rows (22 inches rather than 12) so that people may turn and walk forward rather than side step to the aisle;

(b) by having no intersection of the aisle systems thereby eliminating conflicts with other occupants flowing in different directions; and
(c) by having exits or exit accesses spaced no more than 20 feet apart along the aisle thereby providing exits or exit accesses (at each end of the rows) which would serve only approximately five rows.



Example of Continental Seating

(9) CROSS AISLES. Where provided, aisles parallel to the seat rows shall be not less than 48 inches in width.

(10) UNOBSTRUCTED MEANS OF EGRESS. No aisle, stair, door or other way of ingress or egress shall be obstructed in any manner while the seating facility is occupied by the public.

COMM 62.76 SEATING.

(1) SEATING ARRANGEMENTS. A minimum 12-inch spacing shall be provided between the back of each seat and the front of the seat immediately behind it. The seating arrangement shall comply with the spacing requirements specified in Table 62.76. Where the same level is used for both seats and footrests, the width of this level shall be not less than 26 inches.

When determining row spacing for desks with side mounted tablet arms, whether fixed arms or fold-down arms, the 12-inch spacing will be applied from the front of the tablet arm when in the up position and the back of the next seat forward. The 12-inch space for pull-out tablet arms mounted on the chair in front shall be measured with the tablet arm in the closed position.

TABLE 62.76
ROW SPACING REQUIREMENTS

Type of Seating	Minimum Back-to-Back Spacing[1] (inches)
Seats without backrests	22
Seats with backrests	30
Chair seating	32

[1]All measurements are taken between plumb lines.

(2) FOOTRESTS. Where the same level is not used for both seatboard and footboard, independent footrests shall be provided.

(3) SEATBOARDS AND FOOTBOARDS.

(a) Seatboards and footboards (footrests) shall have a minimum width of 9 inches.

(b) All seatboards and footboards shall be fastened in place in such a manner that they cannot be accidentally displaced.

(4) SEAT OCCUPANT WIDTH. The seating capacity shall be established by allowing one sitting or seat to each 18 inches of length.

(5) RISE BETWEEN ROWS. The maximum rise between seat rows shall not exceed 16 inches unless the horizontal row spacing is 40 inches or more.

(6) STEPS. Where the rise between rows exceeds 12 inches, intermediate steps shall be provided the full width of the aisles. Such steps shall have a uniform rise of not more than 8 inches and a tread of not less than 10 inches in width. In no case shall the angle of seating exceed 45 degrees.

(7) OPENINGS. The design of the seatboards and footboards shall be such that a sphere with a diameter larger than 9 inches will not pass from the seating area to the area beneath the seating where seatboards are more than 5 rows above the ground or floor.

COMM 62.77 GUARDRAILS.

(1) FRONT RAIL. Where the front footrest or cross aisle is more than 2 feet above the ground or floor, a guardrail with a midrail shall be provided at the front of such footrest or cross aisle.

(a) *At front footrest.* When required, the rail at the front footrest shall be not less than 30 inches in height.

(b) *At front cross aisle.* When required, the rail at the front cross aisle shall be not less than 36 inches in height.

(2) BACK AND SIDE RAILS.

(a) Except as provided in par. (b), a guardrail not less than 42 inches in height above the aisle surface or footrest or above the center of the seatboard surface, whichever is adjacent, shall be provided along the back and sides of seating where the seats are more than 4 1/2 feet above the ground or floor.

Multiple section pull-out bleachers must be provided with the capability of having each of the sections guarded at the sides. Although side guardrails will not be required for each of the sections, a means of installing side guardrails must be shown on the plans.

(b) When a wall or fence is within 6 inches of seating and affords protection equivalent to that required under par (a), guardrails may be omitted.

(3) OPENINGS BELOW TOP RAIL. All back, side and front cross aisle guardrails shall have intermediate rails or an ornamental pattern between the footboard or cross aisle and the top rail to prevent the passage of a sphere with a diameter larger than 6 inches.

(4) CROSS AISLE RAIL. A guardrail not less than 30 inches in height with a midrail shall be provided along the front edge of cross aisles where the backs of the seats in front of the cross aisle are less than 24 inches above the cross aisle surface.

(5) LOADING. All guardrails shall be designed and constructed to withstand a vertical and horizontal load of 50 pounds per linear foot. Loads need not be applied simultaneously.

COMM 62.79 SANITARY FACILITIES.

(1) TOILET ROOMS. All spectator assembly facilities shall be provided with toilet rooms and sanitary fixtures as specified in s. COMM 55.32. Toilet room construction and equipment shall comply with the requirements as specified in ss. COMM 52.50 through 52.64.

(2) SANITARY FIXTURES. In determining the number of sanitary fixtures required for spectator assembly facilities under this subchapter, the capacity shall be considered equally divided between men and women. The number of sanitary fixtures shall be determined using Tables 55.32-A but not less than the number determined from Table 55.32-B.

(3) ACCESSIBILITY. Where toilet rooms are provided for the public and are so located that the patrons must cross a ramp area in order to reach the toilet rooms, a suitable approach or passageway leading thereto shall be maintained. Such passageways shall be properly lighted and unobstructed access shall be provided.

Toilet facilities for outdoor places of spectator assembly such as school athletic fields may be provided in the school building if the fixtures in the building are of sufficient quantity to handle the number of spectators and provided access to those fixtures is not restricted.

COMM 62.80 ILLUMINATION AND EMERGENCY LIGHTING.

Illumination and emergency lighting of seating facilities shall comply with the provisions as specified in chs. COMM 16 and Ind 19.

COMM 62.81 FIRE PREVENTION.

(1) FLAMMABLE MATERIALS.

(a) Except as provided in par. (b), the space under a seating facility shall be kept free from flammable materials and shall not be occupied or used for other than exit purposes.

(b) The space under a seating facility may be used for nonhazardous purposes provided the use is approved in writing by the department and the area is enclosed with at least one-hour fire-resistive rated construction.

(2) COMBUSTIBLE AND FLAMMABLE LIQUIDS. Combustible and flammable liquids shall be isolated in accordance with ch. COMM 10.

See COMM 54.14 commentary.

Subchapter VI — Greenhouses

COMM 62.90 SCOPE.

(1) GENERAL. The requirements of this subchapter shall apply to all permanent greenhouses, including free standing, attached and lean-to greenhouses.

Although this section deals with pure greenhouses, the department will permit some of the provisions of this subchapter to be applied to occupied greenhouse-type structures such as sun rooms and fully glazed dining rooms. The allowances and reductions of COMM 62.96 may be applied to any greenhouse-type structure regardless of use. Also, a greenhouse-type structure of totally noncombustible construction may be attached to a building of a higher than Type 6 construction without a class of construction separation. This attachment of a Type 6 constructed greenhouse to a higher class building does not apply to buildings under the scope of Chapter COMM 58.

Note: See s. COMM 62.10 (4) for definition of term "permanent."

(2) LIMITATIONS. The requirements of this subchapter do not apply to temporary greenhouses, cold frames and shade covers; solar domes; skylights; greenhouse type structures not used for cultivating plant life; and production greenhouses used as farm operations as specified in s. 102.04 (3), Stats.

COMM 62.91 CLASSIFICATIONS.

Greenhouses shall be classified as production greenhouses or mercantile or teaching greenhouses as follows:

(1) PRODUCTION GREENHOUSES. Production greenhouses are used for growing plant life on a production basis or for research and public access is restricted.

(2) MERCANTILE OR TEACHING GREENHOUSES. Mercantile or teaching greenhouses are used for growing plant life for direct sale or for research, and public access for the purpose of viewing or purchasing the various products is permitted.

Note: Examples of mercantile or teaching greenhouses include but are not limited to nursery greenhouses and greenhouses used by colleges or universities for teaching purposes.

COMM 62.92 CONSTRUCTION.

(1) FRAME. Greenhouse frames shall be constructed of concrete, corrosive-resistant metals, heavy timber or fire-retardant treated wood or other approved materials.

(2) LIGHT-TRANSMITTING PANEL. Greenhouse roof coverings, exterior walls or interior partitions of glass or approved light-transmitting plastic glazing materials having a minimum of CC 2 rating as specified in s. COMM 51.065 (1) (b) 1. may be used without limitation.

COMM 62.93 OCCUPANCY SEPARATIONS AND HAZARD ENCLOSURES.

Occupancies within the scope of this chapter shall be separated from other occupancies or uses in accordance with s. COMM 51.08. Hazards shall be enclosed in accordance with s. COMM 51.08.

Question: *How does a noncombustible greenhouse type addition such as a sunroom, dining room, etc., affect the allowable area of a building?*

Answer: *Construction of a noncombustible greenhouse type addition doesn't lower or raise the classification of the rest of the building. Area limits shall be satisfied relative to the class of construction of the non-greenhouse parts of the building. The area of the green house shall be included in the computation of the building area.*

COMM 62.94 HEIGHT AND ALLOWABLE AREA.

(1) **HEIGHT.** Greenhouses shall be of one story design only.

(2) **ALLOWABLE AREA.**

(a) 1. Except as provided in subd. 2., the area of mercantile or teaching greenhouses and production greenhouses shall comply with the requirements of s. COMM 54.01 for the class of construction utilized.

2. The area of production greenhouses may be unlimited if the building is entirely surrounded and adjoined by public space, street or yards not less than 60 feet in width.

3. Air inflated films may be used over a greenhouse of noncombustible construction without affecting the class of construction of the greenhouse.

Note: Typical greenhouse construction satisfies either type 6-metal frame unprotected or type 8-wood frame unprotected construction. Type 6 construction greenhouses consist of metal or other noncombustible material framing and glass covering. Type 8 construction greenhouses consist of wood or other combustible material framing or utilize light-transmitting plastic covering.

COMM 62.95 EXITS.

(1) **NUMBER OF EXITS.**

(a) Except as provided in par. (b), every greenhouse shall have at least 2 exits.

(b) Greenhouses with 3,000 or less square feet gross floor area may have one exit.

(2) **EXIT DISTRIBUTION.**

(a) Exits shall be distributed or located so that no part of any greenhouse will be more than 150 feet distant from an exit.

(b) Where an approved automatic fire sprinkler system is provided throughout the greenhouse, the exit distance may be increased to 300 feet.

(3) **TYPE OF EXITS.**

(a) In production greenhouses, at least one-half of the exits required by this section shall be standard exit doors to grade. The other exits may be sliding doors.

(b) In mercantile or teaching greenhouses, the required exits shall be standard exits to grade as specified in s. COMM 51.15.

COMM 62.96 DESIGN LOADS.

(1) **DEAD LOADS.** In addition to normal dead loads as described in s. COMM 53.10, special consideration shall be given to any permanent loads such as, but not limited to, hanging baskets, planters and similar items, that are to be supported by structural members for a continuous period of 30 days or more, and the loads shall be included as part of the dead load.

(2) **CONCENTRATED LOADS.**

(a) All roof members, such as but not limited to, purlins, rafters and truss top members, shall be capable of safely supporting a minimum concentrated live load of 100 pounds applied downward and normal to the roof surface at their midspan. In addition, each bottom chord panel point of the roof trusses shall be capable of safely supporting a minimum concentrated live load of 100 pounds.

(b) Maximum allowable deflection for structural members of greenhouses may not exceed 1/120 of span.

(3) **ROOF LOADS.**

(a) *Definitions.* The following definitions apply only to the provisions of this section:

1. **"Thermal resistance (R)"** means a factor which measures the resistance of a material to the transmission of heat.

Note: The smaller the R value, the greater the amount of heat a material will transmit.

2. **"Continuously heated single glazed greenhouse"** means a single glazed greenhouse which has a constantly maintained interior temperature of at least 50° F, measured at 3 feet above the floor surface, a maintenance attendant is on duty at all times or the greenhouse is equipped with a temperature alarm system to provide warning in the event of a heating system failure and the roof material has a total thermal resistance of less than 1.0.

Note: Air inflated double film greenhouse roof materials and air inflated double film over rigid light-transmitting material satisfy the intent of this definition.

3. **"Continuously heated double glazed greenhouse"** means a double glazed greenhouse which meets the requirements specified in subd. 2. except that the roof material may have a total thermal resistance of greater than 1.0, but less than 2.0.

4. **"Intermittently heated or unheated greenhouse"** means any greenhouse that does not meet the requirements specified in subd. 2. or 3.

(b) *Roof loads.*

1. Except as specified in subd. 3., roof structural members subject to snow accumulation shall be designed for the following roof load distributions:

THERMAL CONDITION	MINIMUM ROOF LOAD
Continuously heated single glazed greenhouse	15 Pounds Per Square Foot
Continuously heated double glazed greenhouse	20 Pounds Per Square Foot
Intermittently heated or unheated greenhouse	See s. COMM 53.11 (4) (a)

2. The minimum roof load shall be distributed over the entire area and shall be applied to the horizontal projection of the roof.

3. Free-standing, single glazed, Quonset-type greenhouses not over 4,500 square feet gross ground area shall be designed for a minimum roof load of 10 pounds per square foot.

(c) *Heat transfer barriers.* Heat transfer barriers installed in the interior of the greenhouse may be used in winter months if they are automatically or manually retractable with a 20 minute time period. Permanent heat transfer barriers may not be used.

(d) *Wind loads.* Except as provided in subds. 1. and 2., greenhouses shall be designed to withstand the wind loads specified in s. COMM 53.12.

1. Greenhouses with a maximum height of 30 feet shall be designed to resist a minimum of total wind load of 15 pounds per square foot.

2. Quonset-type greenhouses not over 15 feet in height shall be designed to resist a minimum total wind load of 10 pounds per square foot.

Subchapter VII — Pedestrian Access Structures Connecting Buildings

COMM 62.97 SCOPE.

The requirements of this subchapter shall apply to all structures used as pedestrian access corridors or walkways between buildings or structures.

The intent of creating this subchapter is to permit buildings to be connected. These buildings may be on separate properties or on the same property. Pedestrian access structures constructed in compliance with this chapter will be considered as equivalent to a 4-hour area division wall, 4-hour property line wall, class of construction separation, number of story separation, and occupancy separation.

COMM 62.98 GENERAL REQUIREMENTS.

(1) CONSTRUCTION. All pedestrian access structures shall be of one of the following classes of construction as specified in s. COMM 51.03:

As a minimum, all pedestrian access structures must be totally noncombustible. As it is to function as a building division wall, it must serve to prevent any fire from progressing from one connected to the other. Therefore, the framing, walls and roof must be totally noncombustible. The floor may be carpeted with Class I carpeting and the walls and ceilings finished with Class A materials if the pedestrian access structure is completely sprinklered.

***Section COMM 62.98 (1)(a)** requires pedestrian access structures of 4 stories or less, to be of totally noncombustible construction.*

Pedestrian access structures, if built to the requirements of Chapter 62, are considered equivalent to building division walls. Therefore, they can be used to connect buildings under separate ownership, cross property lines, separate classes of construction, etc. In order to meet the intent of a building division wall, the intent of the construction requirements is to prevent smoke and fire progression via the access structure from one building to the other (i.e., the structure shall have no construction that will support combustion).

*1. **Question**: May combustible, built-up roof systems be used on pedestrian access structures?*

***Answer:** No. Built-up roofing is considered combustible and will support progressive combustion. Class A roofs will be allowed if the pedestrian access structure is protected by an automatic fire sprinkler system.*

*2. **Question:** May sandwich wall panels consisting of foam plastic core covered with metal be used? If the panels have a DCOMM or Department of Commerce material approval indicating that they may be used where the code requires noncombustible construction, may they be used in pedestrian access structures?*

***Answer:** In both cases, the Answer is no, unless provisions of s. COMM 51.06 (4)(b) 2.b. are met. The foam plastic is combustible and will significantly contribute to the progression of fire and smoke along the length of the structure unless noncombustible cladding and automatic fire sprinkler system protection are utilized.*

*3. **Question:** May combustible wall, floor and ceiling finishes be used in pedestrian access structures?*

***Answer:** Yes, with restrictions. Wall and ceiling finishes with a Class A rating, and floor finish material with a Class I rating per s. COMM 51.07 may be used if the pedestrian access structure is protected by an automatic fire sprinkler system.*

(a) Structures of 4 stories or less, where the open space below elevated structures is counted as a story, shall be of Type 6 construction, or better, and shall be of totally noncombustible construction. "Totally noncombustible construction" in this usage includes but is not limited to compliance with the following subdivisions:

1. Any class A roof may be used if the pedestrian access structure is protected by an automatic sprinkler system as specified in s. COMM 51.23 and the buildings or structures connected to the pedestrian access structure are of Type 6 construction or better.

2. Wall panels consisting of a foam plastic core covered with metal, and complying with the provisions of s. COMM 51.06 (4) (b) 2. b., may be used if the pedestrian access structure is protected by an automatic sprinkler system as specified in s. COMM 51.23 and the buildings or structures connected to the pedestrian access structure are of Type 6 construction or better.

3. Wall and ceiling finishes with a Class A rating and floor finish material with a Class I rating, as specified in s. COMM 51.07, may be used if the pedestrian access structure is protected by an automatic sprinkler system as specified in s. COMM 51.23.

(b) 1. Except as provided in subd. 2., structures of 5 stories, where the space below elevated structures is counted as a story, shall be of Type 3 construction, or better.

2. Supporting columns in the space beneath elevated structures may be of noncombustible 0-hour rated construction.

(c) 1. Except as provided in subd. 2., structures of 6 or more stories, where the space below elevated structures is counted as a story, shall be of Type 2 construction, or better.

2. Supporting columns in the space beneath elevated structures may be of noncombustible 0-hour rated construction.

(2) FLOORS.

(a) Except as provided in par. (b), floor systems separating pedestrian walkway levels shall be of noncombustible one-hour rated construction or better.

(b) The floor system between the lowest pedestrian level and the space below an elevated structure may be of noncombustible 0-hour rated construction.

(3) SEPARATIONS. The pedestrian access structure shall be separated from any building to which it is connected as follows:

(a) 1. Except as provided in subd. 2., the wall of the building within the structure separating the structure from the building shall be of at least 2-hour rated construction.

2. The wall separating the structure from the building need not be of hourly-rated construction provided the structure is more than 20 feet long and all side walls of the structure be open to the atmosphere with the area of the opening being equal to or exceeding 30% of the side wall area.

(b) 1. Except as provided in subd. 2., openings in the wall separating the structure from the building shall be protected with 1 1/2-hour rated fire door assemblies equipped with self-closing devices activated by products of combustion detectors which respond to products of combustion other than heat.

2. a. The opening may be protected with an open head water deluge curtain activated by a products of combustion detector which responds to products of combustion other than heat, in conjunction with solid doors equipped with self-closing devices activated by the water deluge curtain detector.

b. The protection of openings in the wall separating the structure from the building may be omitted provided the structure is more than 20 feet long and all side walls of the structure be open to the atmosphere with the area of the opening being equal to or exceeding 30% of the side wall area.

(4) SEPARATION EQUIVALENCIES. Pedestrian access structures complying with this subchapter may be utilized as division walls, party walls, class of construction separations and occupancy separations.

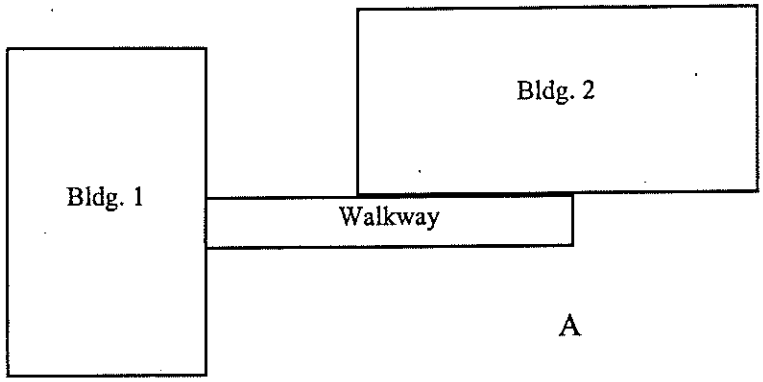
(5) EXTERIOR PROTECTION.

(a) Where the sidewalls of a pedestrian access structure are within 10 feet horizontally of a wall opening of the connected or an adjacent building, the wall opening shall be protected by at least a 3/4-hour fire-resistive rated door or window assembly or the sidewalls of the structure shall be of at least noncombustible one-hour rated construction for a distance of at least 10 feet from the opening or the wall of the connected building.

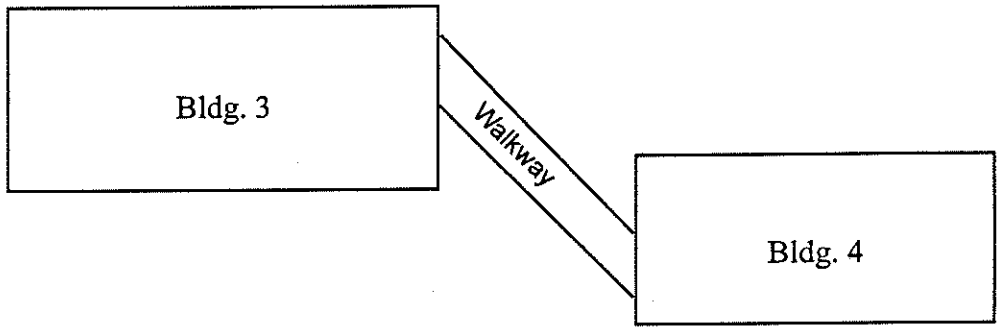
(b) 1. Except as provided in subd. 2., all wall openings of a connected building directly below or below and within 10 feet horizontally of the pedestrian access structure shall be protected by at least 3/4-hour rated fire door or fire window assemblies or the lower floor of the structure shall be of at least noncombustible one-hour rated construction for a distance of at least 20 feet from the wall of the connected building.

2. The fire-resistive rated construction and protection of openings specified in subd. 1. may be omitted provided the pedestrian access structure is protected by a complete automatic fire sprinkler system.

Question: *How should the code be applied to pedestrian access walkways with sides common to a building or at an angle less than 90 degrees to the building wall?*



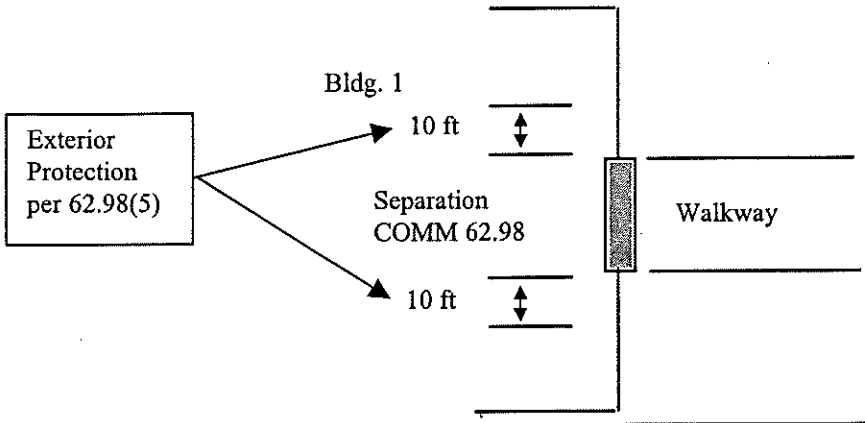
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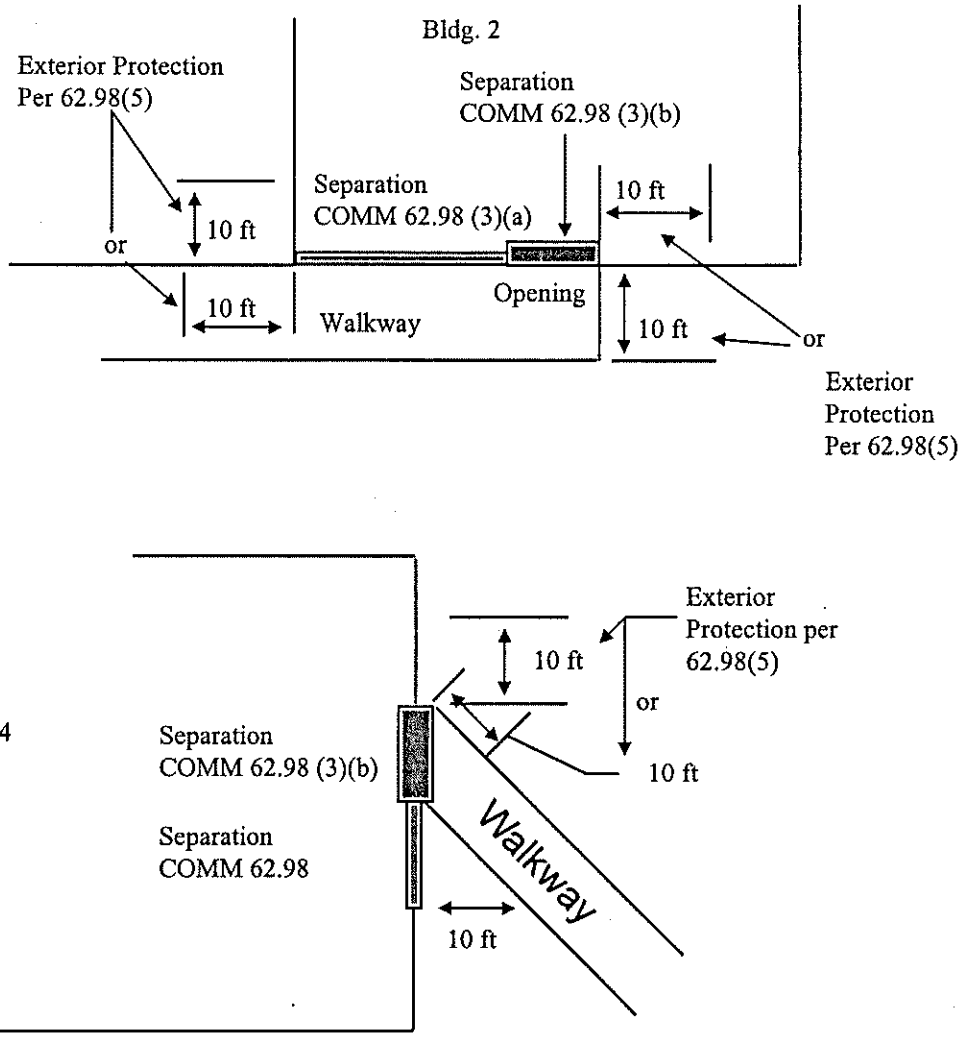


Analysis: *The intent of COMM 62.97 is to make a walkway connection equivalent to a 4-hour separation to allow buildings on different properties, or of differing height, area, class of construction, or use to be connected.*

COMM 62.98 (3)(a) 1. specifies that the separation shall occur at the ***wall of the building*** *within the structure. Based on the logic of COMM Table 51.03-A separation requirements, it is appropriate to consider adjacent walls or walls within 10 feet of the pedestrian access structure as walls requiring protection per 62.98(3)(a).*

Answer: *Separation and exterior protection for the above examples shall be provided as indicated in the diagrams below.*





If separation protection extends > 10 feet from opening, provide exterior protection for the remainder of the 10-foot length.

(6) LOT LINES. Pedestrian access structures which are constructed over lot lines and connecting buildings with different owners shall conform with subs. (3) and (4).

(7) FIRE DEPARTMENT ACCESS.

(a) Except as provided in par. (b), fire department access openings as specified in s. COMM 52.02 (2) shall be provided on each level of the pedestrian access structure.

(b) Fire department access openings may be omitted in structures protected by a complete automatic fire sprinkler system.

COMM 62.99 EXITING.

(1) NUMBER OF EXITS.

(a) Except as provided in sub. (3), every pedestrian access structure, and every level, other than the open space below the structure, shall be provided with at least one exit.

(2) TYPE OF EXITS.

(a) Except as provided in par. (b), the exit specified in sub. (1) from the pedestrian access structure shall be an exit door to grade, a stairway to grade constructed as specified in s. COMM 51.16, or a fire escape to grade constructed as specified in s. COMM 51.20.

(b) 1. Open stairways or fire escapes may not be used as an exit for any level more than 55 feet above grade.

2. Type "A" fire escapes may terminate on a platform at least 3 feet long, located not more than 10 feet above grade.

(3) EXCEPTIONS. The exit specified in sub. (1) from the pedestrian access structure may be omitted providing:

(a) The doors connecting the structure and the building are equipped with exit hardware such that a person can pass from the structure into the building; or

(b) The doors connecting the structure and the building are equipped with hardware that requires a key to pass from the building onto the structure, and that key will also open the door allowing passage from the structure back into the building.

The assumption made with this exception permitting no exits from the pedestrian access structure is that the only people who will be in the structure are those who have a key capable of opening the doors to the structure.

(4) EXIT DISTANCE.

(a) Except as provided in par. (b), exits shall be distributed or located so that no part of the pedestrian access structure will be more than 200 feet distance from an exit.

(b) Where approved automatic fire sprinklers are provided throughout the pedestrian access structure, an increase in exit distance to 300 feet will be permitted.

COMM 62.991 SPECIAL REQUIREMENTS.

(1) PERMITTED USE. Pedestrian access structures may not be used for purposes other than pedestrian walkways.

Pedestrian access structures may not be used for any other purpose than communication between buildings. The pedestrian walkway and a drive lane for vehicles may be provided. Other than these allowances, no other use is permitted.

(2) HEATING AND VENTILATING.

(a) Pedestrian access structures need not be heated but shall be provided with ventilation as specified in s. COMM 64.05 for shopping mall corridor areas.

(b) If the pedestrian access structure is to be heated, the structure shall comply with the provisions of ch. COMM 63 based upon the inside design temperature utilized.

(3) STRUCTURAL.

(a) The floor of the pedestrian access structure shall be designed and constructed for the actual loading, but in no case shall the design live load be less than 100 pounds per square foot.

(b) The roof of the pedestrian access structure shall be designed and constructed in accordance with the provisions of s. COMM 53.11 (4).

(c) The pedestrian access structure shall be designed and constructed to withstand the wind loads specified in s. COMM 53.12.

(d) Elevated pedestrian access structures shall be designed as bridges, including design factors for sway, sympathetic vibration and deflection.

Subchapter VIII — Amusement Facility & Specialty Event Centers

COMM 62.992 SPECIALTY EVENT CENTERS.

(1) APPLICATION. Specialty event centers are assembly halls or places of assembly which include, but are not limited to stadiums, zoos, state and local parks, amusement or theme parks or facilities, state fair grounds, county or local fairgrounds, specialty event centers.

(2) SANITARY FACILITIES. A sufficient number of permanent or temporary sanitary facilities shall be provided as determined from Table 55.32, but in no case shall the ratio of the number of fixtures to the number of occupants or capacity be less than those specified in Table 54.12-A. The total capacity shall be considered equally divided between men and women unless a different ratio is established and submitted to the department.

Subchapter IX — Mini-Storage Buildings

COMM 62.995 MINI-STORAGE BUILDINGS.

(1) SCOPE. This subchapter provides the minimum requirements for the design and construction of mini-storage buildings.

(2) HEIGHT, AREA AND CLASS OF CONSTRUCTION. Mini-storage buildings shall be limited to one story and shall not exceed the class of construction and the corresponding area limitations of Table 59.12-1 or 59.12-2 for one story storage garages.

The term mini-storage requires the compartments to be 3,000 sq. ft. or less.

(3) COMPARTMENTALIZATION. Mini-storage buildings shall be divided into areas not greater than 3,000 square feet by 2-hour fire-resistive walls extending from the noncombustible floor to the underside of the roof deck.

It is not intended that the 2-hour construction extend beyond the exterior or skin but it is intended that the 2-hour construction extend into the dead space inside of eaves and overhang.

(4) CONTENTS. Mini-storage buildings may be utilized for low or moderate hazard material and motor vehicle storage. Storage of high hazard material is prohibited. Uses other than for storage is prohibited, except that a rental or manager's office for the storage facility may be provided, subject to the provisions of ch. COMM 54.

Note: See s. A52.011 of Appendix A for further explanatory material.

Any other use desired to be attached to a mini-storage building is required to be separated by 4-hour construction.

See COMM 52.011 commentary for classifications of hazards.

(5) NUMBER AND LOCATION OF EXITS.

(a) Each compartment of a mini-storage building shall be provided with at least one standard exit or overhead door to the outside.

(b) One exit is permitted from a mezzanine floor level, provided the mezzanine is:

1. Open on at least one side to the floor below;

2. Not more than 12 feet above the floor below; and

3. Served by a stairway as specified in s. COMM 51.16, except that the stairway width may be reduced to 3 feet 0 inches.

(c) Exits shall be provided and distributed as follows:

1. No area of a mini-storage building may be more than 100 feet from an exit, unless the entire building is protected by an automatic sprinkler system.

2. No area of a mini-storage building entirely protected by an automatic fire sprinkler system may be more than 200 feet from an exit.

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Chapter COMM 63

ENERGY CONSERVATION

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A "Commercial Building Energy Conservation/HVAC Code Handbook" has been issued by the Division of Safety & Buildings for use in compliance with Comm 63 & 64 of the Wisconsin Commercial Building Code. Please refer to the Supplementary publications order form found in the front of the Code Commentary if ordering.

Subchapter I — Scope and Purpose

COMM 63.001 SCOPE.

(1) GENERAL. The provisions of this chapter shall apply to all public buildings and places of employment. These provisions are not retroactive unless specifically stated in the administrative rule. Where different sections of this chapter specify different requirements, the most restrictive requirement shall govern.**(2) EXEMPT BUILDINGS AND STRUCTURES.** Buildings and structures, or portions thereof, without space heating or cooling, service water heating, or illumination are exempt from the requirements of this chapter that apply to those systems.

Permanent greenhouses used for research or used solely for education purposes are exempt from the building envelope. The heat used in these facilities is considered process heat. Note that if the greenhouse is openly attached (no partition wall) to an occupied space such as a classroom, or sales area, then the greenhouse is considered part of the building envelope because the heat the greenhouse gains or loses effects the entire building and its heating and cooling system. See COMM 63.45(3)(j & k) for lighting requirements and exclusions.

(3) APPLICATIONS TO EXISTING BUILDINGS.

(a) 1. Additions to existing buildings or structures may be made without making the entire building or structure comply, but the addition shall comply with the requirements of this chapter.

2. If a system serves both the existing building and the addition, any portion of the system or equipment that is altered shall comply with subch. IV.

(b) 1. Any change of occupancy of a building that would increase the required minimum inside temperature as specified in Table 64.05 shall not be permitted unless the building is made to comply with the requirements of this chapter.

2. Any change of use of a building or space within a building that would increase the minimum inside temperature as specified in Table 64.05 shall not be permitted unless the building or space is altered to comply with the requirements of this chapter.

3. Alterations to the building envelope governed by subch. III shall comply with one of the following:

a. The alteration shall not increase the rate of heat loss through the portion of the thermal envelope containing the alteration; or

b. The alteration shall not increase the annual energy use from heat gain or loss through the entire thermal envelope; or

c. The thermal envelope shall be brought into compliance with the requirements of subch. III.

4. Any alteration to the equipment and systems governed by subch. IV shall not be permitted unless the portion of the governed equipment or system being altered is brought into compliance with the requirements of subch IV.

(c) 1. Heating and cooling equipment replacement shall comply with the requirements of this chapter.

2. Rooftop fan systems that are replaced shall be provided with economizers that comply with the requirements of this chapter.

Note: It is the intent of the department to have every new building or addition and every change of occupancy meet the energy conservation requirements of this chapter. It is not the intent to prevent a previously built building from installing air conditioning, nor to cause equipment with several years of remaining service to be discarded due to not being able to meet the required efficiencies of this chapter. However, occupancy changes such as building a warehouse and later remodeling it into an office space will not be permitted unless all the requirements of this chapter are met.

(d) 1. New lighting systems installed in conjunction with an increase of conditioned floor area, such as the addition of a mezzanine, shall meet the requirements of this chapter.

2. Alterations to existing lighting systems that increase the connected lighting load of the building or replace more than 50 percent of the lighting fixtures in the area of the alteration shall meet the requirements of this chapter.

The load is increased when lighting power is added to an existing space without reducing lighting power by an equal amount in another space within the building.

The replacement of ballasts, bulbs, or lamps, as well as the relocation of existing fixtures is considered maintenance, and does not require lighting plan submittal.

COMM 63.002 PURPOSE.

The purpose of this chapter is to provide design requirements which will promote efficient utilization of energy in public buildings and places of employment.

(1) GENERAL. The intent of this chapter is to provide minimum requirements for construction and equipment to conserve energy.

(2) FLEXIBILITY IN USE. It is intended that this chapter be flexible and permit the use of innovative approaches and techniques to achieve effective utilization of energy.

(3) CONFLICT WITH OTHER RULES. This chapter is not intended to conflict with any safety or health requirements. Where such conflict occurs, the safety and health requirements shall govern.

COMM 63.01 PLANS AND SPECIFICATIONS.

Architectural and mechanical plans and specifications shall be submitted in accordance with the requirements outlined in ss. COMM 50.07 and 50.12 and shall contain details and data to demonstrate compliance with the requirements of this chapter. Such information shall include, but is not limited to: design criteria, exterior envelope component materials, and resistance values of insulating materials. Size and type of equipment, system and equipment controls and equipment efficiencies shall be submitted with the mechanical plans.

Note: The resistance values for insulating materials are expressed in Fahrenheit degrees per Btu/(hour)(square foot). See A50.12 of the appendix for sample copies of forms.

Subchapter II — Definitions

COMM 63.05 DEFINITIONS.

In this chapter:

(1) "Ambient Lighting" is lighting designed to provide a substantially uniform level of illumination throughout an area, exclusive of any provision for special visual tasks or decorative

effect. When designed for lower-than-task illuminance used in conjunction with other specific task lighting systems, it is also called "general" lighting.

(2) "**Automatic**" means self-acting, operating by its own mechanism when actuated by some impersonal influence, such as, a change in current strength, pressure, temperature, or mechanical configuration.

(3) "**Automatic time switch control devices**" means control devices that are capable of automatically turning loads off and on based on time schedules.

(4) "**Building envelope**" means the elements of a building that enclose conditioned spaces through which thermal energy may be transferred to or from the exterior or to or from unconditioned spaces.

(5) "**Comfort cooling" or "comfort heating**" means treating air to control one or more of the following: temperature, relative humidity, or distribution to meet the comfort requirements of the human occupants of the conditioned space.

(6) "**Conditioned floor area" or "CFA**" means the floor area in square feet of enclosed conditioned space on all floors of a building, as measured at the floor level of the exterior surfaces of exterior walls enclosing the conditioned space.

(7) "**Conditioned space**" means a cooled space, heated space, or indirectly conditioned space.

(8) "**Cooled space**" means an enclosed space within a building that is conditioned by a cooling system with a sensible capacity that either exceeds 5 Btu/hr sq ft or is capable of maintaining a space dry-bulb temperature of 90°F or less at design conditions.

(9) "**Daylighting control**" means a device that automatically regulates the power input to electric lighting near the fenestration to maintain the desired workplace illumination, thus taking advantage of direct or indirect sunlight.

(10) "**Deadband**" means the range of values within which an input variable can be varied without initiating any noticeable change in the output variable.

(11) "**Degree day**" means a unit based upon temperature difference and time, used in estimating annual heating or cooling energy consumption. One degree day accrues for each degree of difference between the daily mean temperature and a reference temperature.

(12) "**Display lighting**" means lighting confined to the area of a display that provides a higher level of illuminance than the level of surrounding ambient illuminance.

(13) "**Daylit area**" means the space on the floor that is the larger of par. (a) or par. (b) as follows:

(a) 1. For areas daylit by vertical glazing, the daylit area has the length of 15 feet, or the distance on the floor, perpendicular to the glazing, to the nearest 60-inch or higher opaque partition, whichever is less; and a width of the window plus either 2 feet on each side, the distance to an opaque partition, or one-half the distance to the closest skylight or vertical glazing, whichever is least.

2. For areas daylit by horizontal glazing, the daylit area is the footprint of the skylight plus, in each of the lateral and longitudinal dimensions of the skylight, the lesser of the floor-to-ceiling height, the distance to the nearest 60-inch or higher opaque partition, or one-half the horizontal distance to the edge of the closest skylight or vertical glazing.

(b) The daylit area calculated using a method acceptable to the department.

Note: See Appendix A for additional illustrative information.

(14) "**Economizer, air**" means a ducting arrangement and automatic control system that allows a cooling supply fan to supply outside air to reduce or eliminate the need for mechanical refrigeration during mild or cold weather.

(15) "**Economizer, water**" means a system by which the supply air of a cooling system is cooled directly or indirectly or both by evaporation of water or other appropriate fluid in order to reduce or eliminate the need for mechanical refrigeration during some time periods.

(16) "**Effective aperture" or "EA**" means (1) for windows, the visible light transmittance times the window wall ratio; and (2) for sky lights, the well efficiency times the visible light transmittance times the sky light area times 0.85 divided by the gross exterior roof area.

(17) "**Efficacy**" means the ratio of light from a lamp to the electrical power consumed, including ballast losses, expressed in lumens per watt.

(18) "**Emissivity**" means the ratio of the rate of radiant heat energy emitted by a body at a given temperature to the rate of radiant heat energy emitted by a standard called a blackbody, at the same temperature in the same surroundings.

(19) "**Exterior envelope**" has the same meaning as "building envelope."

(20) "**Exterior roof or ceiling**" means an exterior partition, or partition separating a conditioned space from an enclosed unconditioned space, that has a slope less than 60 degrees from horizontal, that has conditioned space below, and that is not an exterior door or skylight.

(21) "**Exterior roof or ceiling area**" means the area of the exterior surface of exterior roof or ceiling.

(22) "**Exterior wall**" means an exterior partition that is not an exterior floor or soffit, exterior door, exterior roof or ceiling, window, or skylight.

(23) "**Exterior wall area**" means the area of the opaque exterior surface of exterior walls.

(24) "**Fenestration**" means any light-transmitting section in a building wall or roof. The fenestration includes glazing material, which may be glass or plastic, framing such as mullions, muntins, and dividers, external shading devices, internal shading devices, and integral or between glass shading devices.

(25) "**Fenestration area**" means the total area of fenestration measured using the rough opening and including the glazing material, sash, and frame.

(26) "**General lighting**" means lighting designed to provide a substantially uniform level of illumination throughout an area, exclusive of any provision for special visual tasks or decorative effect. When designed for lower-than- task illuminance used in conjunction with other specific task lighting systems, it is also called "ambient" lighting.

(27) "**Gross exterior wall area**" means the gross area of exterior walls separating a conditioned space from the outdoors or from unconditioned spaces as measured on the exterior above grade. It consists of the opaque wall, excluding vents and grills, including between floor spandrels, peripheral edges of flooring, window areas including sash, and door areas.

(28) "**Gross floor area**" means the sum of the floor areas of the conditioned spaces within the building including basements, mezzanine and intermediate-floored tiers, and penthouses of headroom height 7.5 ft or greater. It is measured from the exterior faces of exterior walls or from the centerline of walls separating buildings, excluding covered walkways, open roofed-over areas, porches and similar spaces, pipe trenches, exterior terraces or steps, chimneys, roof overhangs, and similar features.

(29) "**Gross floor area over outside or unconditioned spaces**" means the gross area of a floor assembly separating a conditioned space from the outdoors or from unconditioned spaces as measured from the exterior faces of exterior walls or from the center line of walls separating buildings. The floor assembly shall be considered to include all floor components through which heat may flow between indoor and outdoor or unconditioned environments.

(30) "**Gross lighted area" or "GLA**" means the sum of the total lighted areas of a building measured from the inside of the perimeter walls for each floor of the building.

(31) "**Gross roof area**" means the gross area of a roof assembly separating a conditioned space from the outdoors or from unconditioned spaces, measured from the exterior faces of exterior walls or from the centerline of walls separating buildings. The roof assembly shall be considered to include all roof or ceiling components through which heat may flow between indoor and outdoor environments including skylights but excluding service openings.

(32) "**Gross exterior roof area**" means the sum of the skylight area and the exterior roof/ceiling area.

(33) "**Gross exterior wall area**" means the sum of the window area, door area and exterior wall area.

(34) "**Heat capacity" or "HC**" means the amount of heat necessary to raise the temperature of a given mass one degree. Numerically, it is the mass multiplied by the specific heat.

(35) "**Heated space**" means an enclosed space within a building that is conditioned by a heating system with an output capacity either exceeds 10 Btu/hr sq ft or is capable of maintaining a space dry-bulb temperature of 50°F or more at design conditions.

(36) "**Heating, ventilating, and air conditioning system" or "HVAC system**" means the equipment, distribution network, and terminals that provide either collectively or individually the process of heating, ventilating, or air conditioning to a building.

(37) "**Humidistat**" means a device that is capable of being set to prevent the use of fossil fuel or electricity to humidify air above 30 percent relative humidity or dehumidify air to below 60 percent relative humidity, or both.

(38) "**Indirectly conditioned space**" means an enclosed space including, but not limited to, unconditioned volume in atria, that is not directly conditioned space; and either has an area-weighted heat transfer coefficient to directly conditioned space exceeding that to the outdoors or to unconditioned space, or is a space through which air from directly conditioned spaces is transferred at a rate exceeding three air changes per hour.

(39) "**Listed space area" or "LS**" means any interior space with an identified area of activities for which a lighting power budget is calculated and listed in the lighting power allowance determination.

(40) "**Lumen maintenance control device**" means a device capable of automatically adjusting the light output of a lighting system throughout a continuous range to provide a preset level of illumination.

(41) "**Luminaire**" means a complete lighting unit consisting of at least one lamp and the parts designed to distribute the light, to position and protect the lamp, to connect the lamp to the power supply and ballasting, when applicable. Luminaires are commonly referred to as "lighting fixtures" or "instruments."

(42) "**Manual**" means capable of being operated by personal intervention.

(43) "**Mass wall**" means a wall assembly with a heat capacity (HC) greater than or equal to 5 Btu/ft^2·°F.

(44) "**Mass wall insulation position**" means:

(a) Exterior insulation position: a wall having all or nearly all of its mass exposed to the room air with the insulation on the exterior of that mass.

(b) Integral insulation position: a wall having mass exposed to both room and outside air with substantially equal amounts of mass on the inside and outside of the insulation layer.

(c) Interior insulation position: a wall not meeting either par. (a) or (b), particularly a wall having most of its mass external to an insulation layer.

(45) "**Medical and clinical care**" means the promotion of the condition of being sound in body or mind through medical, dental or psychological examination and treatment.

(46) "**Multiscene dimming system**" means a lighting control device that has the capability of setting light levels throughout a continuous range, and that has pre-established settings within the range.

(47) "**Occupant-sensing device**" means a device that automatically controls the lights based on occupancy.

(48) "**Opaque areas**" means all exposed areas of a building envelope which enclose conditioned space except fenestration areas and building service openings such as vents and grilles.

(49) "**Ornamental chandeliers**" means ceiling-mounted, close-to-ceiling, or suspended decorative luminaires that use glass, crystal, ornamental metals, or other decorative material and that typically are used in hotels/motels, restaurants, or churches as a significant element in the interior architecture.

(50) "**Precision commercial or industrial work**" means an art, craft, or manufacturing operation requiring a certain degree of refinement.

(51) "**Private driveways, walkways, and parking lots**" means exterior transit areas that are associated with a commercial or residential building and intended for use solely by the employes or tenants and not by the general public.

(52) "**Public driveways, walkways, and parking lots**" means exterior transit areas that are intended for use by the general public.

(53) "**Recooling**" means lowering the temperature of air that has been previously heated by a heating system.

(54) "**Recovered energy**" means energy utilized from an energy-using system which would otherwise be wasted or not contribute to a desired end use.

(55) "**Reduced flicker operation**" means the operation of a light, in which the light has a visual flicker less than 30 percent for frequency and modulation.

(56) "**Reheating**" means raising the temperature of air that has been previously cooled either by refrigeration or an economizer system.

Note: Introducing outdoor air necessary to meet ventilation requirements or to assure adequate indoor air quality is not considered to be cooling.

(57) "**Reset**" means adjustment of the controller set point to a higher or lower value automatically or manually.

(58) "Sconce" means a wall mounted decorative light fixture.

(59) "Shading coefficient" or "SC_x" means the ratio of solar heat gain through fenestration, with or without integral shading devices, to that occurring through unshaded 1/8-in. thick clear double strength glass.

(60) "Shell building" means a building for which the envelope is designed, constructed, or both prior to knowing the occupancy type.

Note: See also speculative building.

(61) "Speculative building" means a building for which the envelope is designed, constructed, or both prior to the design of the lighting, HVAC systems, or both. A speculative building differs from a shell building in that the intended occupancy is known for the speculative building.

Note: See also shell building.

(62) "Support area" means an area for functions that are different from but necessary to accomplish the main activity or purpose of other listed space areas.

(63) "Tandem wiring" means pairs of luminaires operating with one lamp in each luminaire powered from a single two-lamp ballast contained in the other luminaires.

(64) "Task oriented lighting" means lighting that is designed specifically to illuminate a task location, and that is generally confined to the task location.

(65) "Thermal break" means an element of low thermal conductivity placed in an assembly to reduce the flow of heat between highly conductive materials.

(66) "Thermal conductance" or "C" means the constant time rate of heat flow thorough a unit area of a body induced by a unit temperature difference between the surfaces, expressed in $Btu/h \cdot ft^2 \cdot °F$ or equivalent units. It is the reciprocal of thermal resistance.

(67) "Thermal resistance" or "R" means the reciprocal of thermal conductance, 1/C expressed in $h \cdot ft^2 \cdot °F/Btu$ or equivalent units. The total thermal resistance of an assembly is $1/U_o$.

(68) "Thermal transmittance" or "U" means the overall coefficient of heat transfer from fluid to fluid. It is the time rate of heat flow per unit area under steady conditions from the fluid on the warm side of the barrier to the fluid on the cold side, per unit temperature difference between the two fluids, expressed in $Btu/h \cdot ft^2 \cdot °F$ or equivalent units.

(69) "Thermal transmittance, overall" or "U_o" means the gross overall (area weighted average) coefficient of heat transfer from air to air or fluid to fluid for a gross area of the building envelope, expressed in Btu/hr.ft2.°F or equivalent units. The U_o value applies to the combined effect of the time rate of heat flows through the various parallel paths such as windows, doors, and opaque construction areas comprising the gross area of one or more building envelope components such as walls, floors, and roof or ceiling.

(70) "Thermostat" means an automatic control device responsive to temperature.

(71) "Throw distance" means the distance between the luminaire and the center of the plane on a subject lit by the luminaire.

(72) "Unconditioned space" means a space within a building that is not a conditioned space.

Note: See conditioned space.

(73) "Unlisted space" means the difference in area between the gross lighted area and the sum of all listed space areas.

(74) "Variable air volume HVAC system" or "VAV HVAC system" means HVAC systems that control the dry-bulb temperature within a space by varying the volume of air supply to the space.

(75) "Visible light transmittance" or "VLT" means the ratio expressed as a decimal of visible light that is transmitted through a glazing material to the light that strikes the material.

(76) "Wall heat capacity" or "HC" means the sum of products of the mass of each individual material in the wall per unit area of wall surface times its individual specific heat, Btu/(ft^2 °F).

(77) "Well efficiency" means the ratio of the amount of visible light leaving a skylight well to the amount of visible light entering the skylight well and is calculated as follows:

(a) for rectangular wells:

$$\left(\frac{\text{Well height (well length + well width)}}{\text{2 x well length x well width}}\right) = \text{the well index}$$

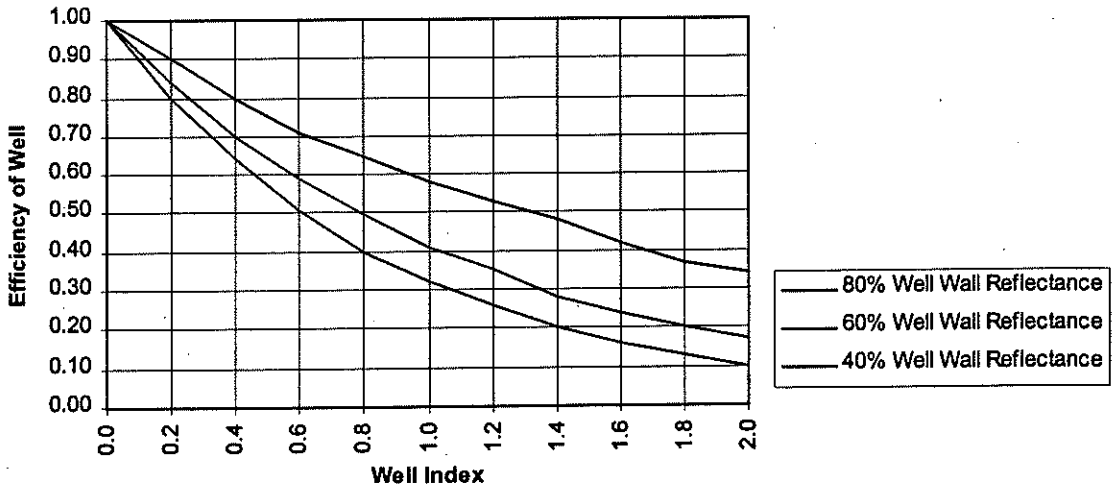
; or

(b) for irregular shaped wells:

$$\left(\frac{\text{Well height x well perimeter}}{\text{4 x well area}}\right) = \text{the well index}$$

(c) The length, width, perimeter, and area expressed in pars. (a) and (b) are measured at the bottom of the well. The well index and the weighted average well wall reflectance are used in Figure 63.02 to determine the well efficiency.

Figure 63.02 Well Efficiency



Information taken from: Fig 7-38, IES Lighting Handbook, 1984 Reference

(78) "Window" means glazing that is not a skylight.

(79) "**Window area**" means the area of the surface of a window, plus the area of the frame, sash, and mullions.

(80) "**Window wall ratio**" means the ratio of the window area, including glazed areas of doors, to the gross exterior wall area.

(81) "**Zone**" means a space or group of spaces within a building with any combination of heating, cooling, or lighting requirements sufficiently similar so that desired conditions can be maintained throughout by a single controlling device.

Subchapter III — Building Envelope

COMM 63.10 EXEMPT BUILDINGS.

This subchapter applies to buildings or separately enclosed identifiable areas that have a mechanical space heating or air conditioning system.

Part 1 - General Requirements

COMM 63.11 AIR LEAKAGE AND MOISTURE MIGRATION.

(1) GENERAL. The requirements of this section apply to those building components that separate interior building conditioned space from the outdoors or from unconditioned spaces or crawl spaces. Compliance with the criteria for air leakage through building components shall be determined by tests conducted in accordance with specified standards.

(2) AIR LEAKAGE REQUIREMENTS FOR FACTORY MANUFACTURED FENESTRATION AND DOORS.

(a) Factory manufactured fenestration shall meet one of the following standards for air leakage as adopted in s. COMM 51.25:

1. ANSI/AAMA 101 Aluminum and Poly Vinyl Chloride (PVC) Prime Windows and Glass Doors.
2. ASTM D 4099 Specification for Poly Vinyl Chloride (PVC) Prime Windows.
3. ANSI/NWWDA I.S.2 Wood Windows (Improved Performance Rating Only).

(b) Factory manufactured sliding doors shall meet one of the following standards for air leakage:

1. ANSI/AAMA 101 Aluminum and Poly Vinyl Chloride (PVC) Prime Windows and Glass Doors.
2. ANSI/NWWDA I.S.3 Wood Sliding Patio Doors.

(c) Factory manufactured commercial entrance swinging or revolving doors shall limit air leakage to a rate not to exceed 1.25 cfm/ft^2 of door area when tested at standard test conditions in accordance with ASTM E283.

(d) Factory manufactured residential swinging doors shall limit air leakage to a rate not to exceed 0.5 cfm/ft^2 of door area when tested at standard test conditions in accordance with ASTM E283.

Note: The term "factory manufactured" does not apply to units constructed or fabricated in the field or to units assembled from individual components at a lumber yard or building material center.

(3) AIR LEAKAGE REQUIREMENTS FOR EXTERIOR ENVELOPE JOINTS AND PENETRATIONS. Exterior joints, cracks, and holes in the building envelope shall be caulked, gasketed, weather stripped, or otherwise sealed. Such joints include the following:

(a) Around window or door frames.

(b) Between wall or floor and foundation.

(c) Between wall and roof or roof decking.

(d) Through wall panels and top and bottom plates in exterior walls.

(e) At penetrations of utility services or other service entry through walls, floors, and roofs.

(f) Between wall panels particularly at corners and changes in orientation.

(g) Between wall and floor where floor penetrates wall.

(h) Around penetrations made through the insulated envelope by chimneys, flue vents, or attic hatches.

Note: Sealing methods should be designed to be compatible with the chimney or vent listing.

(4) MOISTURE CONDENSATION. The design of buildings shall not create conditions of accelerated deterioration from moisture condensation.

Note: Vapor retarders and ventilation should be considered to prevent moisture from collecting within the envelope. The principles of ASHRAE Handbook, Fundamentals Volume, may be used as a guide.

COMM 63.12 DAYLIGHT CREDITS FOR SKYLIGHTS.

(1) When determining building roof compliance using either the component standards of s. COMM 63.15 or the system standards of s. COMM 63.16, daylight credits for skylights may be used if the criteria of this section are met.

Note: Skylights used in conjunction with automatic lighting controls for daylighting can significantly reduce the lighting energy consumption thereby more than offsetting the increase in envelope heat transfer.

(2) Skylights for which daylight credit is taken may be excluded from the calculations of the overall thermal transmittance value of the roof assembly (U_{or}) if all of the following conditions are met:

(a) The opaque roof thermal transmittance value U_{or} does not exceed the values determined for the roof within the appropriate Alternate Component Package (ACP) table selected under s. COMM 63.15 (1) or by s. COMM 63.16.

(b) The criteria of section 8.4.8 of ASHRAE Standard 90.1 are met.

(c) Areas for vertical glazing, or glazing within 30 degrees of vertical of clerestories or roof monitors shall be included in the wall fenestration calculation of s. COMM 63.15 or 63.16.

Note: See A63.12 of the appendix for general information on the criteria of section 8.4.8 of ASHRAE Standard 90.1.

Part 2 - Thermal Performance

COMM 63.14 BUILDING ENVELOPE THERMAL PERFORMANCE.

(1) Except as provided in subs. (2) and (3), building envelopes shall comply with either the component standards of s. COMM 63.15 or the system standards of s. COMM 63.16. The calculation procedures of s. COMM 63.18 shall be used to show compliance.

(2) Buildings and areas of buildings that are used as factories shall comply with s. COMM 63.165.

(3) Buildings and areas of buildings that are used as warehouses that have documentation provided to verify that the HVAC system to be installed does not use energy primarily to provide human comfort shall comply with s. COMM 63.165.

Note: See s. COMM 63.10 for exempt buildings and spaces.

A heated car wash is typically heated in order to eliminate the possibility of equipment failure due to the wash water freezing. A heated car wash building is required to meet the requirements of COMM 63.14(1). A car wash is not a factory (this building is not a source of process heat) or a warehouse. When the car wash building is heated, the building is ***not*** *heated as a byproduct of the process of washing a car, the building is heated in addition to the car washing process.*

Car wash areas that are not heated are NOT required to demonstrate compliance with the building envelope requirements of the code.

A Chapter 59 heated storage garage is required to meet the requirements of COMM 63.14(1). Thermal performance associated with COMM 63.14 (2) & 63.14(3) may not be applied because this is not a Chapter 54 factory or warehouse.

COMM 63.15 Component standards option.

This section describes the component standards for building envelope thermal performance. Because component requirements consider the effect of solar gain as well as conductive heat transfer, the requirements for each component shall be met independently under this option. The wall and roof trade-off exception in sub. (3) may be used with this option. The System Analysis Design Method of Subchapter III shall be used to demonstrate the acceptability of trade-offs between component energy-conserving features. Separate occupancies in the same building shall meet the requirements of this section independently.

(1) DETERMINATION OF APPROPRIATE ACP TABLE. The appropriate alternate component package or ACP table shall be determined based on building location using Figure 63.15.

(2) MAXIMUM ALLOWABLE WINDOW WALL RATIO. The percentage of windows, including glazed areas of doors, relative to the gross external wall area of the building shall be less than or equal to the maximum allowable window wall ratio chosen from the appropriate ACP table for the glazing type of the building. The window wall ratio is the total area of window assemblies, including glazed areas of doors, divided by the total gross exterior wall area, considering all elevations of the building. The maximum allowable window wall ratio shall be determined using the following steps:

(a) Select the Shading Coefficient (SC_x) range that is no less than the fenestration SC_x including permanently installed internal, integral and external shading devices, but excluding the effect of external shading projections. Note that this includes curtains, shades, or blinds that are permanently installed. For a shell or speculative building for which the envelope is designed or constructed prior to the design of the lighting, HVAC systems, or both, only those shading devices that are part of the design when it is being evaluated for compliance shall be considered when determining compliance.

Note: Refer to ASHRAE Handbook, Fundamentals Volume, Chapter 27 for more information on shading coefficients. Shading coefficients for fenestration are obtained from the manufacturer. See also s. COMM 63.18 (4).

(b) Select appropriate fenestration type. This is determined by the thermal transmittance value (U_{of}) of the fenestration assembly. The U_{of} of all assemblies must fall within the range, or lower, to determine the maximum window wall ratio, or an area-weighted average thermal transmittance value may be used.

(3) WALL AND ROOF TRADE-OFF. Trade-offs between the above grade exterior wall opaque areas and the gross roof area shall be allowed if either of the following conditions are met:

(a) The thermal transmittance, overall value (Uo) for any above grade exterior opaque wall area or gross roof area may be increased or decreased, provided that the total annual energy use due to heat gain and loss for the building envelope shall be less than or equal to the total annual energy use due to heat gain and loss resulting from the use of the values in the appropriate ACP table given in Figure 63.15.

Note: The latest version of the ENVSTD computer program may be used to determine required thermal transmittance values in lieu of the ACP tables. ENVSTD is the computer program included in the ASHRAE Standard 90.1.

(b) A submittal to the department for review and approval, incorporating recognized engineering practices, that the annual energy use due to heat gain and loss for the building envelope shall be less than or equal to that established in sub. (A).

(4) THERMAL TRANSMITTANCE VALUES FOR ROOFS, WALLS NEXT TO UNCONDITIONED SPACES, AND FLOORS OVER UNCONDITIONED SPACES.

(a) The U-values for the building roofs, walls next to unconditioned spaces, and floors over unconditioned spaces shall be less than or equal to those listed in the appropriate ACP table given in Figure 63.15.

(b) Skylights for which daylight credit cannot be taken in accordance with s. COMM 63.12 shall be included in the calculation of the overall thermal transmittance value of the roof assembly (U_{or}).

(c) Unconditioned below-grade spaces that have floor or ceiling assemblies insulated as specified on the appropriate ACP table do not require below-grade wall insulation.

(5) THERMAL RESISTANCE VALUE FOR SLAB-ON-GRADE FLOORS.

(a) Unheated slab-on-grade floors shall have insulation around the perimeter of the floor with the thermal resistance (R_u) of the insulation as listed in the appropriate ACP table.

(b) For heated slabs-on-grade, the required minimum R-value shall be the R-value for the unheated slab-on-grade plus 2.0.

"Heated slabs-on-grade" means slab-on-grade construction in which the heating elements or hot air distribution system is in contact with or placed within the slab or the subgrade.

(c) The slab insulation specified shall extend either in a vertical plane downward from the top of the slab for the minimum distance given in the appropriate ACP table or downward to the bottom of the slab then in a horizontal plane beneath the slab or outward from the building for the minimum distance given in the ACP table. Vertical insulation shall not be required to extend below the foundation footing.

(d) The R-value and dimensions required for slabs refer only to the building insulation materials. Insulative continuity shall be maintained in the design of slab edge insulation systems. Continuity shall be maintained from the wall insulation through the intersection of the slab, wall and footing to the body of the slab edge insulation.

The Federal Department of Energy has made the determination that "slab edge insulation must have no gaps from the top of the slab to the end of the length of insulation below grade".

Figure 63.15
Degree Day Regions

REGIONS	ACP TABLE
1,2,4	A
3,5,6,7,8	B
9,10,11	C

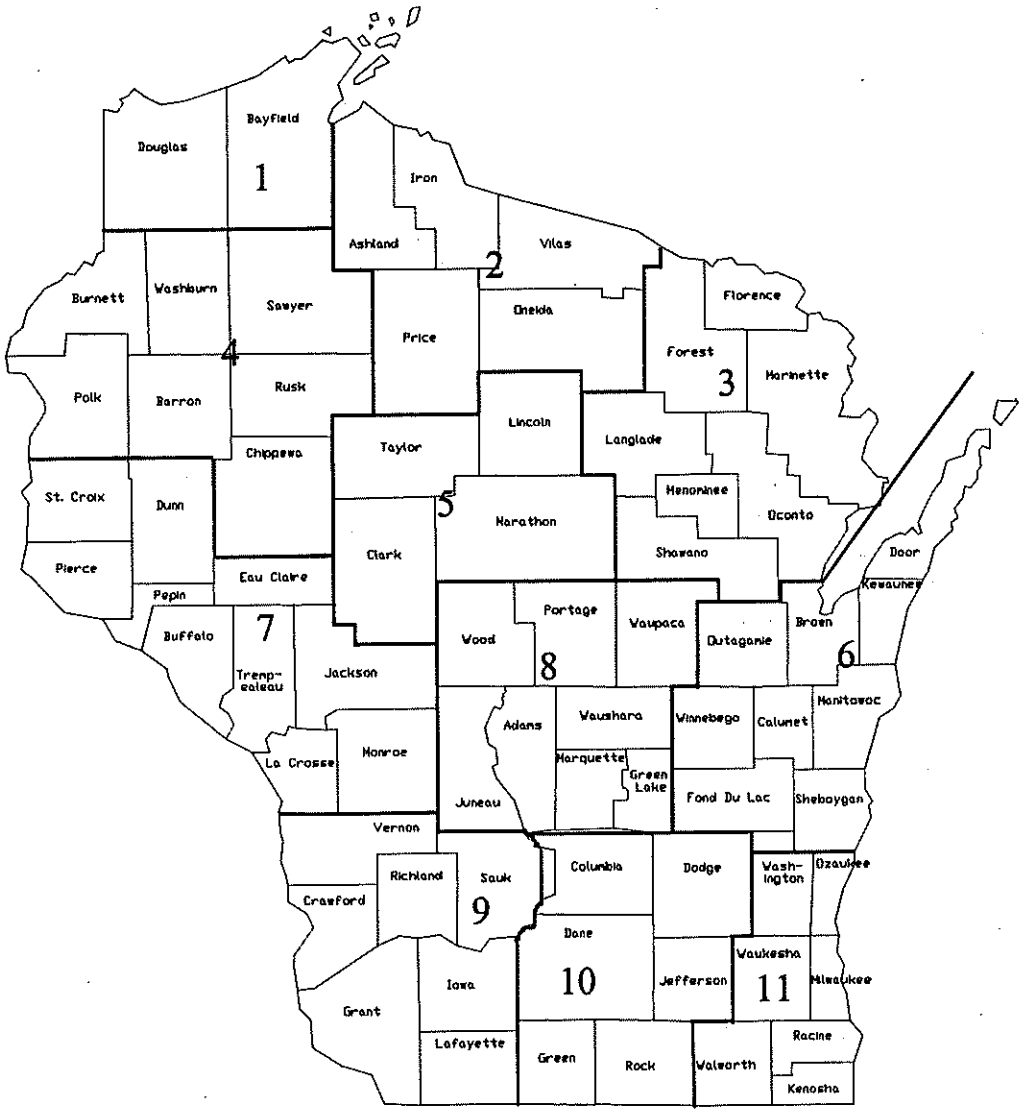


Figure 63.15 (Continued)
Alternate Component Package
ACP Table A

Part A1: Maximum Window Area / Gross Exterior Wall Area						
Exterior Wall U_o	Shading Coefficient Range SC_x	U_{of} Range				
		0.60 to 0.56	0.55 to 0.51	0.50 to 0.46	0.45 to 0.41	≤ 0.40
≤ 0.06	0.80 - 0.71	0.20	0.21	0.23	0.25	0.27
	0.70 - 0.61	0.20	0.22	0.24	0.26	0.28
	0.60 - 0.51	0.21	0.22	0.25	0.27	0.30
	0.50 - 0.41	0.21	0.23	0.25	0.28	0.31
	≤ 0.40	0.21	0.23	0.26	0.29	0.33
0.061 to 0.070	0.80 - 0.71	0.18	0.20	0.21	0.23	0.25
	0.70 - 0.61	0.18	0.20	0.22	0.24	0.27
	0.60 - 0.51	0.19	0.21	0.23	0.25	0.28
	0.50 - 0.41	0.19	0.21	0.23	0.26	0.30
	≤ 0.40	0.19	0.21	0.24	0.27	0.31
0.071 to 0.080	0.80 - 0.71	0.16	0.18	0.20	0.22	0.24
	0.70 - 0.61	0.17	0.18	0.20	0.23	0.25
	0.60 - 0.51	0.17	0.19	0.21	0.23	0.26
	0.50 - 0.41	0.17	0.19	0.21	0.24	0.27
	≤ 0.40	0.18	0.19	0.22	0.25	0.28
0.081 to 0.090	0.80 -0.71	0.15	0.16	0.18	0.20	0.22
	0.70 - 0.61	0.15	0.17	0.18	0.21	0.23
	0.60 - 0.51	0.15	0.17	0.19	0.21	0.24
	0.50 - 0.41	0.16	0.17	0.19	0.22	0.25
	≤ 0.40	0.16	0.17	0.20	0.22	0.26

Part A2: Other Criteria
Roof Max U_o = 0.040
Wall Adjacent to Unconditioned Space Max U_o = 0.10
Floor Over Unconditioned Space Max U_o = 0.040
Wall Below Grade Min R-Value = 13

Part A3: Unheated Slab-On-Grade Minimum R-Value			
Insulation Orientation	Length of Insulation 24"	36"	48"
Horizontal	R=18	R=15	R=11
Vertical	R=8	R=6	R=4

Figure 63.15 (Continued)
Alternate Component Package
ACP Table B

Part B1: Maximum Window Area / Gross Exterior Wall Area						
Exterior Wall U_o	Shading Coefficient Range SC_x	U_{of} Range 0.60 to 0.56	0.55 to 0.51	0.50 to 0.46	0.45 to 0.41	≤ 0.40
≤ 0.06	0.80 - 0.71	0.20	0.21	0.22	0.23	0.24
	0.70 - 0.61	0.21	0.22	0.24	0.25	0.27
	0.60 - 0.51	0.22	0.24	0.25	0.27	0.29
	0.50 - 0.41	0.24	0.25	0.27	0.30	0.32
	≤ 0.40	0.25	0.27	0.29	0.32	0.35
0.061 to 0.070	0.80 - 0.71	0.19	0.20	0.21	0.22	0.23
	0.70 - 0.61	0.20	0.21	0.22	0.24	0.25
	0.60 - 0.51	0.21	0.23	0.24	0.26	0.28
	0.50 - 0.41	0.22	0.24	0.26	0.28	0.31
	≤ 0.04	0.24	0.26	0.28	0.31	0.34
0.071 to 0.080	0.80 - 0.71	0.18	0.19	0.20	0.21	0.23
	0.70 - 0.61	0.19	0.20	0.21	0.23	0.24
	0.60 - 0.51	0.20	0.21	0.23	0.25	0.27
	0.50 - 0.41	0.21	0.23	0.25	0.27	0.29
	≤ 0.40	0.22	0.24	0.27	0.29	0.32
0.081 to 0.090	0.80 -0.71	0.17	0.18	0.19	0.20	0.21
	0.70 - 0.61	0.18	0.19	0.20	0.21	0.23
	0.60 - 0.51	0.19	0.20	0.21	0.23	0.25
	0.50 - 0.41	0.20	0.21	0.23	0.25	0.28
	≤ 0.40	0.21	0.23	0.25	0.27	0.30

Part B2: Other Criteria
Roof Max U_o = 0.045
Wall Adjacent to Unconditioned Space Max U_o = 0.11
Floor Over Unconditioned Space Max U_o = 0.040
Wall Below Grade Min R-Value = 12

Part B3: Unheated Slab-On-Grade Minimum R-Value			
Insulation Orientation	Length of Insulation 24"	36"	48"
Horizontal	R=18	R=15	R=11
Vertical	R=8	R=6	R=4

Figure 63.15 (Continued)
Alternate Component Package
ACP Table C

Part C1: Maximum Window Area / Gross Exterior Wall Area						
Exterior Wall U_o	Shading Coefficient Range SC_x	U_{of} Range				
		0.60 to 0.56	0.55 to 0.51	0.50 to 0.46	0.45 to 0.41	≤ 0.40
≤ 0.06	0.80 - 0.71	0.20	0.21	0.22	0.22	0.23
	0.70 - 0.61	0.22	0.23	0.24	0.25	0.26
	0.60 - 0.51	0.23	0.25	0.26	0.27	0.29
	0.50 - 0.41	0.25	0.27	0.29	0.30	0.32
	≤ 0.40	0.27	0.29	0.32	0.34	0.37
0.061 to 0.070	0.80 - 0.71	0.19	0.20	0.21	0.22	0.23
	0.70 - 0.61	0.21	0.22	0.23	0.24	0.25
	0.60 - 0.51	0.22	0.24	0.25	0.26	0.28
	0.50 - 0.41	0.24	0.26	0.27	0.29	0.31
	≤ 0.40	0.26	0.28	0.30	0.33	0.35
0.071 to 0.080	0.80 - 0.71	0.18	0.19	0.20	0.21	0.22
	0.70 - 0.61	0.20	0.21	0.22	0.23	0.24
	0.60 - 0.51	0.21	0.23	0.25	0.26	0.27
	0.50 - 0.41	0.23	0.25	0.26	0.28	0.30
	≤ 0.40	0.25	0.27	0.29	0.31	0.34
0.081 to 0.090	0.80 -0.71	0.17	0.18	0.19	0.20	0.21
	0.70 - 0.61	0.19	0.20	0.21	0.22	0.23
	0.60 - 0.51	0.20	0.22	0.23	0.24	0.26
	0.50 - 0.41	0.22	0.23	0.25	0.27	0.29
	≤ 0.40	0.24	0.26	0.28	0.30	0.33

Part C2: Other Criteria
Roof Max U_o = 0.049
Wall Adjacent to Unconditioned Space Max U_o = 0.11
Floor Over Unconditioned Space Max U_o = 0.040
Wall Below Grade Min R-Value = 11

Part C3: Unheated Slab-On-Grade **Minimum R-Value**			
Insulation Orientation	Length of Insulation 24"	36"	48"
Horizontal	R=18	R=15	R=11
Vertical	R=8	R=6	R=4

COMM 63.16 SYSTEM STANDARDS OPTION.

To comply with the system standards for building envelope thermal performance, the building shall comply with section 8.6 of ASHRAE standard 90.1 as adopted in s. COMM 51.25 or with the system analysis design of s. COMM 63.70 to 63.72 applied to the thermal envelope alone. Building site climate data shall be determined using Wisconsin Division of State Energy Statistics or other source acceptable to the department.

Note: Section 8.6 of ASHRAE 90.1 requires use of the latest version of the ENVSTD computer program. ENVSTD is the computer program included in the ASHRAE 90.1 Standard.

In addition to the ENVSTD version 2.4 or later computer program, the Department will also accept the use of COMcheck-EZ version 1.0 or 1.1 computer program. Only the Building Envelope portion of the COMcheck-EZ computer program has been approved for use in showing code compliance. ***The Lighting and the HVAC portions of COMcheck-EZ have NOT been approved for use with the commercial code. The allowed lighting densities listed in the program DO NOT correspond to the values associated with the Wisconsin Commercial Code.*** *Note that the prescriptive requirements of COMcheck-EZ have NOT been approved for use in showing building envelope compliance. Prescriptive requirements for the code can be found in COMM 63.15. The computer programs can be obtained by calling 1-800-270-2633*

The following are comments and observations which the Division of Safety & Buildings would like to pass to the users of COMcheck-EZ, the most popular program used by designers.

IGNORE GYPSUM BOARD, OUTSIDE & INSIDE AIR FILM INPUTS

Designers should not include R-Values associated with gypsum board, outside air film, or inside air film. COMcheck-EZ already contains this information when computing compliance. Adding these value to a particular input will only serve to double the insulative values associated with these components, and cause plans to be held until proper calculations are presented, and building envelope compliance demonstrated.

MASONRY WALLS

When establishing information on an exterior wall, specifically any exterior Structural Masonry Wall, the following items need to be acknowledged and addressed. If the CMU (Concrete Masonry Unit) involved with the construction of the wall has no other insulation other than the insulation of the CMU itself (i.e. With or Without Integral Insulation, then both the cavity and the continuous R-Value columns are required to be listed as "0"(zero). Designers will find that COMcheck-EZ will automatically have a default U-Factor for the Structural Masonry Wall listed under the Assembly U-Factor column.

If the Structural Masonry Wall, described above, has 1 inch of continuous extruded polystyrene on the outside of the wall, then the Continuous R-Value column is required to have an input of "5". The "5" is reflective of the R-Value of 1 inch of extruded polystyrene. The Assembly U-Factor will reflect the insulation value of both the masonry wall type, and the added extruded polystyrene.

If the Structural Masonry Wall described above has wood or metal furring along with a Structural Masonry Wall Type, then the designer is required to input this information along with the wall type on the computer screen following the Structural Masonry Wall checkoff. If fiberglass insulation, R-11, is placed in the cavity of the furring, then the designer is required to place "11" in the cavity R-

Value column. The Assembly U-Factor will reflect the insulation value of both the masonry wall type, and the furring wall type with R-11 insulation.

METAL ROOFS

A designer has a building which has R-19 fiberglass insulation which is rolled from one purlin to the next purlin without a thermal break. The designer is required to use the COMcheck-EZ Roof Type involving a Metal Roof with NO Thermal Breaks. The R-19 fiberglass insulation is NOT entered as Continuous R-Value insulation when using COMcheck-EZ since the fiberglass is crushed between the final roof deck and the purlin and has negligible insulation value at the purlin locations. The R-19 insulation would properly be entered as Cavity R-Value insulation. The Assembly U-Factor will then reflect the effective insulative value of the R-19 fiberglass insulation. COMcheck-EZ will automatically address the metal roof framing factors in the Assembly U-Factor column. An example of continuous insulation is the use of extruded polystyrene on the roof, placed such that it continuous across the designated roof area. If there are thermal breaks between the purlins and the roof and R-19 fiberglass insulation is installed, the designer is required to use the COMcheck-EZ Roof Type involving a Metal Roof WITH Thermal Breaks. Again, enter the proper R-19 value in the Cavity R-Value column and COMcheck-EZ will automatically address the metal roof framing factors and the thermal break in the Assembly U-Factor column.

WALLS, ROOFS, WINDOWS & SKYLIGHTS MUST MEET MINIMUM INSULATION REQUIREMENTS

A Designer may have failed building envelope compliance even though COMcheck-EZ shows a positive compliance percentage on the lower right of the computer screen. This occurs when a exterior wall, roof or skylight has R-Values that are below the minimum required by ASHRAE Standard 90.1-1989.

A one time note shown on the computer screen will read "The overall U-Factor for this assembly exceeds X.XX (a number would be listed), the maximum U-Factor for this wall (roof, window or skylight) in this location. To correct this problem, increase the wall (roof, window or skylight) R-Value of the wall insulation."

"This program does not check this requirement in determining compliance, although it is included as a mandatory requirement in the compliance report."

Report printouts which state that the required minimum R-Value has not been met (COMcheck-EZ version 1.0 will allow printouts, version 1.1 will not), will place the building plans on hold until the designer can show compliance. *The building plans may also be sent back to the designer so that they can modify their building details such that they can demonstrate building envelope compliance through the use of COMM 63.15, 63.16, or 63.70 through 63.72.*

ADDITIONS

For additions, the following two options can be used to demonstrate compliance: (1) Treat the addition as a stand-alone building and ignore the common partition between the existing building and addition. Note that a design may still require insulation in the common partition wall because it may be a "wall adjacent to a unconditioned space"; OR (2) Combine the existing building with the addition. Both of these methods can be used with the COMcheck-EZ software.

OTHER NOTES

Multiple types of wall, roof, or slab edge insulation assemblies require multiple entries. Multiple types of windows, doors, skylights, etc. require multiple entries.

If the slab edge insulation does not have insulative continuity, then the slab assembly must be listed as a component along with its perimeter, however, the Continuous R-Value should read "0" zero.

If the commercial building has a basement, then the basement must be listed as a component. If the designer chooses to not insulate the basement walls, then the basement must be listed as a component along with its area, however, the Cavity R-Value and the Continuous R-Value should read "0" zero. Note that the Assembly U-Factor column will reflect the type of below-grade exterior wall designated by the designer.

COMcheck-EZ has been approved for use with all commercial buildings covered by COMM Chapters 50-64, 66 & 69. Specifically, all multi-family buildings may use COMcheck -EZ to demonstrate code compliance with the building envelope portion of the code.

PRINTOUT REQUIREMENT

COMcheck-EZ can be used to show building envelope compliance. Only one (1) printout is required to be submitted per building review. The printout is considered to be designer calculations. The printout must be properly bound, stamped and signed by the supervising professional if required by code.

COMM 63.165 DESIGN CRITERIA.

(1) THERMAL PERFORMANCE.

(a) Except as provided in par. (b), the thermal performance values for the exterior envelope of buildings or areas of buildings that are warehouses that meet the criteria of s. COMM 63.14 (3), or that are factories shall not exceed the values in Table 63.165-1. The calculation procedures of s. COMM 63.18 shall be used to show compliance.

Table 63.165-1
Thermal Performance Values

Number of Stories	Thermal Performance Values*
1-2	12
3-4	13
5-7	16
8-12	18
13-20	20
Over 20	21

*Expressed in Btu/hour/square foot of above-grade exterior envelope. See s. COMM 63.23 (2) and (3) for design conditions.

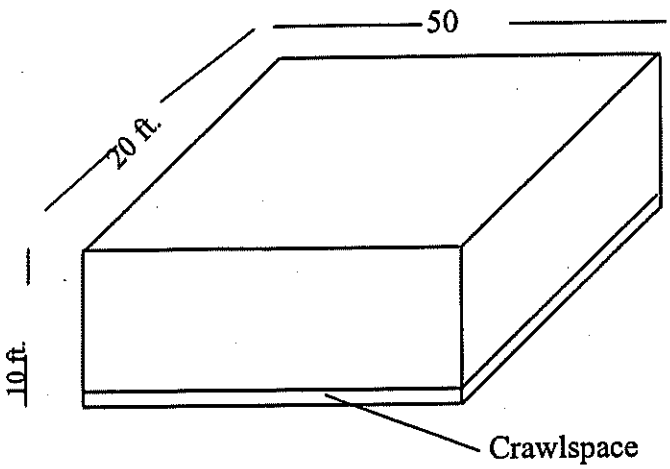
(b) The thermal performance values specified in par. (a) may be increased or decreased provided the U-value for other components is decreased or increased so the total heat gain or loss for the entire building envelope and floor area does not exceed the total heat gain or loss resulting from conformance to the values specified in this section.

Thermal performance value may be increased if the total of the heat loss through the above-grade envelope and the heat loss through the floor over an unheated space does not exceed the thermal performance value times the building envelope area + 0.08 x floor area x ΔT

Example:

One-Story Building

Given
$U_{wall} = 0.15$
$U_{roof} = 0.10$
$\Delta T = 100°$



Walls = (10 x 2(20 + 50) x 0.15 x 100 = 21,000
Roof = (20 x 50) x 0.10 x 100 = 10,000
Total above-grade heat loss = 31,000 Btu/hr

Thermal Performance $= \frac{31,000}{\text{Envelope area}} = \frac{31,000}{1,400 + 1,000} = \frac{31,000}{2,400} = 12.92 > 12$ *:. . . No good*

Walls = 10 x 140 x 0.15 x 100 = 21,000
Roof = 20 x 50 x 0.10 x 100 = 10,000
Floor = 20 x 50 x 0.05 x 100 = 5,000
Total actual loss = 36,000 Btu/hr

Total loss allowed = 12 x bldg. envelope area + 0.08 x floor area x ΔT
= 12 x 2,400 + 0.08 x 1,000 x 100
= 28,880 + 8,000
= 36,800 Btu/hr

Total loss allowed (36,800 Btu/hr) > Total actual loss (36,000 $\frac{Btu}{hr}$*) . . .Compliance is met*

Actual thermal performance allowed $= \frac{36,000}{2,400} = 15$

(2) FLOORS OVER UNCONDITIONED SPACES. The overall heat transmission coefficient (U-value) for floors of heated or mechanically cooled spaces over unconditioned spaces shall not exceed 0.08 Btu/°F. Sq. Ft. hour.

(3) SLAB-ON-GRADE PERIMETER INSULATION. For slab-on-grade floors with or without a grade beam, a foundation bearing wall or a foundation frost wall, the thermal resistance of the insulation around the perimeter of the floor shall not be less than the values shown in Table 63.165-2. The insulation shall extend 48 inches in the vertical or horizontal direction or combination thereof with a total dimension of 48 inches. Slab-on grade perimeter insulation shall be moisture resistant.

Table 63.165-2
Perimeter Insulation Requirements[1]

Slab-on-grade Perimeter Insulation		Zone 1	Zone 2	Zone 3	Zone 4
R = °F Sq. Ft. Hour Btu	Unheated Slabs	6.7	6.2	5.9	5.2
	Heated Slabs[2]	9.3	9.0	8.6	8.2

1 See Fig. 63.23 for zone definitions.
2. Heated slabs have piping, duct work or other heat distribution system components embedded in or under them.

The following interpretation has been adopted by the Department in order to address the possibility of trading-off thermal performance of the above-grade building envelope against perimeter insulation performance. The following formula, which was taken from ASHRAE Fundamentals, shall be used to calculate the uninsulated slab heat loss:

$$Q = 0.81 \times P \times (T_i - T_o)$$

Q = the uninsulated heat loss in Btu/hour

P = the slab perimeter in feet

T_i *= the inside design temperature in °F.*

T_o *= the outside air temperature in °F.*

If the sum of the uninsulated slab loss (calculated from the above equation) and the above-grade transmission heat loss for a building is not greater than the heat loss allowed by the applicable thermal performance value, then the perimeter insulation required by this section may be omitted or modified. Calculations shall be submitted in order to justify omitting or modifying the slab-on-grade perimeter insulation.

The following is a commentary worksheet.

Thermal Performance Worksheet

Envelope Area - Wall

Height Abovegrade	2 x (Building Width + Length)	Above-grade Wall total area
	x	= sq. ft.

Envelope Area - Roof

Width	Length	Roof total area
	x	= sq. ft.

Total Roof/Wall Envelope Area =
(Add envelope area wall and roof sections) _____ sq. ft.

Actual Wall Heat Loss

Window Heat Loss (U window * A window)	**Door Heat Loss** U door * A door)	**Opaque Wall Heat Loss*** (U Wall * A wall)	TD**	**Actual Wall Heat Loss**
(	)+(	)+(	)+	= Btu/hr.

Actual Roof Heat Loss

Roof Total Area	**U-Value**	**TD****	**Roof Heat Loss**
	x	x	= Btu/hr

Actual Floor Heat Loss (For floors over unconditioned spaces)

Floor Area	**U-Value**	**TD****	**Floor Heat Loss**
	x	x	= Btu/hr

Wall heat loss (from above) _____ Btu/hr

Roof heat loss (from above) _____ Btu/hr

Actual Total Loss =
(Add Floor, Wall and Roof heat losses.) _____ Btu/hr

Total Loss Allowed

Thermal Performance Value (chart on next page)	Total Roof/Wall Envelope Area (from above)	Floor Area Over Unconditioned Space	TD**	Total Loss Allowed
	x	+[0.08 x	x	] = Btu/hr

Compare the *Total Loss Allowed* with the *Actual Total Loss*. The *Total Loss Allowed* should be greater that the *Actual Total Loss* calculated above.

*Different areas of wall may have different U-Values. To find the overall Heat Loss use the following equation:

Overall opaque wall heat loss = $U_1A_1 + U_2A_2 + ...U_nA_n$): where U_nA_n is the product of U and Area of opaque wall sections of different U values such as the exposed foundation wall, or portions with different exterior finishes, etc.

** TD = interior design temperature minus the winter design from figure COMM 63.23

Thermal Performance Worksheet (continued)

Thermal Performance Values Chart

Number of Stories	Thermal Performance Value*
1-2	12
3-4	13
5-7	16
8-12	18
13-20	20
over 20	21

*Expressed in Btu/hr/square foot of above-grade exterior envelope.

Optional calculations for uninsulated slab heat loss

The following interpretation has been adopted by the Department in order to address the possibility of trading-off thermal performance of the above-grade building envelope against perimeter insulation performance. The following formula, which was taken form ASHRAE Fundamentals, shall be used to calculate the uninsulated slab heat loss.

$Q = 0.81 \times P \times (t_i - t_o)$ where:

Q = The uninsulated heat loss in Btu/hr.
P = The slab perimeter in feet.
T_i = The inside design temperature in degrees Fahrenheit
T_o = The outside air temperature in degrees Fahrenheit.

Uninsulated Slab Heat Loss

	Perimeter in feet	Inside Design Temperature in F°	Outside Air Temperature in F°	Uninsulated slab heat loss in Btu/hr
0.81	x	(	—	) = Btu/hr

If the sum of the uninsulated slab loss (calculated from the above equation) and the above-grade transmission heat loss for a building is not greater than the heat loss allowed by the applicable thermal performance value, then the perimeter insulation required by s. COMM 63.165 (3) may be omitted or modified. The calculations shall be submitted in order to justify omitting or modifying the slab-on-grade perimeter insulation.

Uninsulated slab loss (from above)	x	Total actual loss walls, roof & floor (from previous page)	≤	Total loss allowed (from previous page)

Other trade-offs must include calculations. For more information regarding trade-offs, see COMM 63.70 through 63.72

COMM 63.17 MATERIAL PROPERTIES.

(1) When available, information on thermal properties, performance of building envelope sections, and components and heat transfer shall be obtained from ASHRAE Handbook, Fundamentals Volume, adopted in s. COMM 51.25.

(2) (a) When the information is not available from ASHRAE Handbook, Fundamentals Volume, the data may be obtained from manufacturer's information or laboratory or field test measurements. If laboratory or field test measurements are used for envelope heat transmission, they shall be obtained using one of the following test methods adopted in s. COMM 51.25.

1. GUARDED HOT PLATE: ASTM C 177;
2. HEAT FLOW METER: ASTM C 518;
3. GUARDED HOT BOX: ASTM C 236; or
4. CALIBRATED HOT BOX: ASTM C 976.
5. PIPE INSULATION: ASTM 335.

(b) For foam plastic insulations that use a gas other than air as the insulating medium, laboratory or field tests shall be conducted on representative samples that have been aged for the equivalent of 5 years or until the R-Value has stabilized. The tests shall be conducted by an independent third party and shall be submitted for department review and approval in accordance with s. COMM 50.19.

COMM 63.18 REQUIRED CALCULATION PROCEDURES.

The following procedures shall be used to calculate the thermal performance of above- and below-grade envelope sections of any building that is heated or mechanically cooled.

(1) **OVERALL THERMAL TRANSMITTANCE (U_o).** The overall thermal transmittance of the building envelope assembly shall be calculated in accordance with the equation given below.

$$U_o = \Sigma U_i A_i / A_o$$
$$= (U_1A_1 + U_2A_2 + \bullet\bullet\bullet\bullet + U_nA_n)/A_o$$

where:

U_o = The area-weighted average thermal transmittance of the gross area of an envelope assembly; that is the exterior wall assembly including fenestration and doors, the roof and ceiling assembly, and the floor assembly, Btu/h•ft^2•°F.

A_o = The gross area of the envelope assembly, ft^2.

U_i = The thermal transmittance of each individual path of the envelope assembly, for example, the opaque portion of the wall assembly, Btu/h•ft^2•°F. U_i also equals 1/Ri where Ri is the total resistance to heat flow of an individual path through an envelope assembly.

A_i = The area of each individual element of the envelope assembly, ft^2.

(2) **THERMAL TRANSMITTANCE (U_i) OF AN INDIVIDUAL PATH THROUGH AN ENVELOPE ASSEMBLY.** The thermal transmittance of each envelope shall be determined

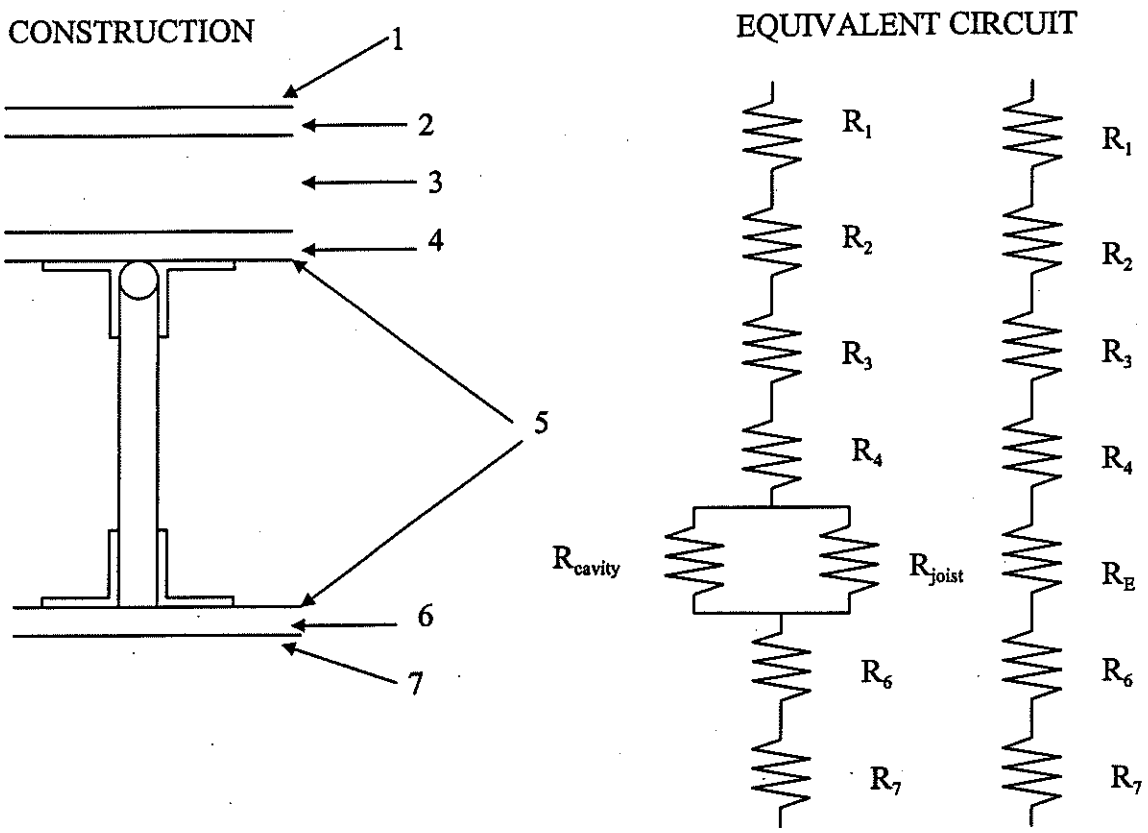
with consideration of all major series and parallel heat flow paths through the elements of the assembly and film coefficients. Compression of insulation shall be considered in determining the thermal resistance.

(a) *Thermal transmittance of opaque elements.* The thermal transmittance of opaque elements of assemblies shall be determined using a series path procedure with correction for the presence of parallel paths within an element of the envelope assembly such as wall cavities with parallel paths through insulation and studs. An acceptable procedure shall be used, as specified in Figure 63.18-1. Figure 63.18-2 illustrates a typical roof assembly.

Figure 63.18-1 Calculation Procedures for Evaluating Major Series and Parallel Heat Flow Paths

Acceptable Procedures for Determining Ui for Opaque Elements		
Sheathing	Framing	
	Metal	Nonmetal
Metal on One or Both Sides	Tests - s. COMM 63.18 (2)(a) 1.a. Thermal Bridges - s. COMM 63.18 (2)(a) 1.c.	Tests - s. COMM 63.18 (2)(a) 1.a. Series or Parallel Path - s. COMM 63.18 (2)(a) 2.
Nonmetal on Both Sides	Tests - s. COMM 63.18 (2)(a) 1.a. Parallel Path Correction Factor - s. COMM 63.18 (2)(a) 1.b. Zone Method - s. COMM 63.18 (2)(a) 1.d.	Tests - s. COMM 63.18 (2)(a) 1.a. Series or Parallel Path - s. COMM 63.18 (2)(a) 2.

Figure 63.18-2 Calculation Procedure for Thermal Resistance of a Typical Roof Assembly



Where $1/R_e = \frac{(1 - \%\ \text{joist})}{R\ \text{cavity}} + \frac{\%\ \text{Joist}}{R\ \text{joist}}$ or $R_e = R\ \text{cavity} \times F_c$

R_e is the equivalent resistance of the element contacting the parallel path. F_c is the parallel path correction factor.

1. For envelope assemblies containing metal framing, the U_i shall be determined by using one of the following methods:

   a. Results from laboratory or field test measurements. One of the procedures specified in s. COMM 63.17 shall be used.

   b. The thermal resistance of those roof and wall assemblies listed in Tables 63.18-1 and 63.18-2 shall be corrected using the following parallel path correction factor procedure:

Considering the total resistance of the series path:

$$U_i = 1/R_t$$

$$R_t = R_i + R_e$$

where:

R_t = The total resistance of the envelope assembly.

R_i = The resistance of the series elements (for i = 1 to n) excluding the parallel path element(s)

R_e = The equivalent resistance of the element containing the parallel path, the value of R_e is:

R_e = R-value of insulation x F_c

The Parallel Path Correction Factors (F_c) may be obtained from tests conducted using procedures listed in s. COMM 63.17. Parallel Path Correction Factors for some envelope assemblies are listed in Tables 63.18-1 and 63.18-2.

c. For elements with internal metallic structures bonded on one or both sides to a metal skin or covering, the calculation procedure specified in the ASHRAE Handbook, Fundamentals Volume, or specified in ASHRAE 90.1, or other procedure acceptable to the department shall be used to include the effects of thermal bridges in metal construction.

d. For elements other than those covered above, the zone method described in the ASHRAE Handbook, Fundamentals Volume shall be used for calculation.

Table 63.18-1

Roofs
Parallel Path Correction Factors[a]

Bridged R-Value	0	5	10	15	20	25	30	35	40	45	50	55
Correction Factor	1.0	0.96	0.92	0.88	0.85	0.81	0.79	0.76	0.73	0.71	0.69	0.67

[a] Table values are based upon metal trusses with 4-foot spacing that penetrate the insulation, and 0.66-inch diameter cross members every 1 foot.

Table 63.18-2

Wall Sections With Metal Studs
Parallel Path Correction Factors

Size of Members	Gauge of Stud[a]	Spacing of Framing, in.	Cavity Insulation R-Value	Correction Factor	Effective Framing/Cavity R-Values
2 x 4	18-16	16 o.c.	R-11	0.50	R-5.5
			R-13	0.46	R-6.0
			R-15	0.43	R-6.4
2 x 4	18-16	24 o.c.	R-11	0.60	R-6.6
			R-13	0.55	R-7.2
			R-15	0.52	R-7.8
2 x 6	18-16	16 o.c.	R-19	0.37	R-7.1
			R-21	0.35	R-7.4
2 x 6	18-16	24 o.c.	R-19	0.45	R-8.6
			R-21	0.43	R-9.0
2 x 8	18-16	16 o.c.	R-25	0.31	R-7.8
2 x 8	18-16	24 o.c.	R-25	0.38	R-9.6

[a] These factors can be applied to metal studs of this gauge or thinner.

2. For assemblies containing nonmetal framing, the U_i shall be determined from one of the laboratory or field test measurements specified in s. COMM 63.17 or from the ASHRAE series-parallel method. Formulas in the ASHRAE Handbook, Fundamentals Volume, shall be used for these calculations.

3. The opaque portions of doors shall be considered to be a part of the opaque wall assembly in the calculation of the average thermal transmittance. The thermal transmittance of the entire opaque door assembly including the frame shall be included in the calculation.

Note 1: See Appendix A for sample U-values for doors and explanatory information.

Note 2: See s. COMM 51.045 for thermal barrier requirements for foam plastics.

(b) *Thermal transmittance of fenestration.* Values of U_{of} shall be determined using one of the following methods:

1. The National Fenestration Rating Council (NFRC) 100 Procedure for Determining Fenestration Product Thermal Properties. The thermal performance values shall be certified through the NFRC Fenestration Thermal Performance Rating Certification and Labeling Program as described in the NFRC Product Certification Program LAP 1, PCP 1, and CAP 1.

2. The values for the appropriate product type given in Table 63.18-3 may be used.

Note 1: Interpolation between tables for glazing other than 0°, 45° and 90° is acceptable.

Note 2: In order to use the component standards option of s. COMM 63.15, the U-value of fenestration must be 0.52 or less.

For NFRC certification, check with the curtain-wall or window manufacturer, not the glass manufacturer. If the product has not been rated and certified in accordance to NFRC 100, use the values from the default tables that follow.

Table 63.18-3, Part 1
Window U-Values

Glazing Type	Aluminum Frame-- no thermal break*	Aluminum Frame-- thermal break*	Wood or Vinyl Frame
Single glazing			
Glass	1.23	1.10	0.98
1/8 in. acrylic	1.16	1.03	0.92
Double glass, air filled			
1/4 in. air space	0.78	0.65	0.55
3/8 in. air space	0.74	0.60	0.51
1/2 in. and greater	0.72	0.59	0.49
Double glass, low emissivity = 0.4 on surface 2 or 3			
1/4 in. air space	0.73	0.59	0.50
3/8 in. air space	0.67	0.54	0.45
1/2 in. and greater	0.65	0.52	0.42
Double glass, low emissivity = 0.15 on surface 2 or 3			
1/4 in. air space	0.68	0.55	0.46
3/8 in. air space	0.62	0.48	0.39
1/2 in. and greater	0.60	0.46	0.37
Double glass, argon filled			
1/4 in. argon space	0.74	0.61	0.51
3/8 in. argon space	0.71	0.57	0.48
1/2 in. and greater	0.69	0.56	0.47
Double glass, low emissivity = 0.4 on surface 2 or 3, argon filled			
1/4 in. argon space	0.67	0.54	0.45
3/8 in. argon space	0.63	0.49	0.40
1/2 in. and greater	0.62	0.48	0.39
Double glass, low emissivity = 0.15 on surface 2 or 3, argon filled			
1/4 in. argon space	0.62	0.48	0.39
3/8 in. argon space	0.57	0.43	0.34
1/2 in. and greater	0.55	0.42	0.33
Double glazing, 1/8 in. acrylic or polycarbonate			
1/4 in. air space	0.74	0.61	0.51
3/8 in. air space	0.71	0.57	0.48
1/2 in. and greater	0.69	0.56	0.47
Double glazing, 1/4 in. acrylic or polycarbonate			
1/4 in. air space	0.71	0.57	0.48
3/8 in. air space	0.68	0.54	0.45
1/2 in. and greater	0.66	0.53	0.43
Triple glass			
1/4 in. air space	0.64	0.50	0.41
3/8 in. air space	0.60	0.46	0.38
1/2 in. and greater	0.58	0.45	0.36
Triple glass or double glass with polyester film suspended in between, low emissivity = 0.15 on surface 2, 3, 4, or 5			
1/4 in. air space	0.59	0.45	0.37
3/8 in. air space	0.54	0.41	0.32
1/2 in. and greater	0.52	0.39	0.30
Triple glass, argon filled			
1/4 in. argon space	0.60	0.46	0.38
3/8 in. argon space	0.57	0.44	0.35
1/2 in. and greater	0.56	0.42	0.34
Triple glass or double glass with polyester film suspended in between, low emissivity = 0.15 on surface 2, 3, 4, or 5			
1/4 in. argon space	0.54	0.41	0.32
3/8 in. argon space	0.51	0.37	0.29
1/2 in. and greater	0.50	0.36	0.28

Table 63.18-3, Part II
Skylight U-Values - 45 Degree Slope

Glazing Type	Aluminum Frame-- no thermal break*	Aluminum Frame-- thermal break*	Wood or Vinyl Frame
Single glazing			
Glass	1.36	1.22	1.09
1/8 in. acrylic	1.29	1.14	1.02
Double glass, air filled			
1/4 in. air space	0.88	0.74	0.63
3/8 in. air space	0.83	0.68	0.58
1/2 in. and greater	0.81	0.67	0.56
Double glass, low emissivity = 0.4 on surface 2 or 3			
1/4 in. air space	0.82	0.67	0.57
3/8 in. air space	0.76	0.61	0.52
1/2 in. and greater	0.74	0.59	0.49
Double glass, low emissivity = 0.15 on surface 2 or 3			
1/4 in. air space	0.77	0.63	0.53
3/8 in. air space	0.70	0.55	0.46
1/2 in. and greater	0.68	0.53	0.44
Double glass, argon filled			
1/4 in. argon space	0.83	0.69	0.58
3/8 in. argon space	0.80	0.65	0.55
1/2 in. and greater	0.78	0.64	0.54
Double glass, low emissivity = 0.4 on surface 2 or 3, argon filled			
1/4 in. argon space	0.76	0.61	0.52
3/8 in. argon space	0.71	0.56	0.47
1/2 in. and greater	0.70	0.55	0.46
Double glass, low emissivity = 0.15 on surface 2 or 3, argon filled			
1/4 in. argon space	0.70	0.55	0.46
3/8 in. argon space	0.65	0.50	0.40
1/2 in. and greater	0.63	0.49	0.39
Double glazing, 1/8 in. acrylic or polycarbonate			
1/4 in. air space	0.83	0.69	0.58
3/8 in. air space	0.80	0.65	0.55
1/2 in. and greater	0.78	0.64	0.54
Double glazing, 1/4 in. acrylic or polycarbonate			
1/4 in. air space	0.80	0.65	0.55
3/8 in. air space	0.77	0.61	0.52
1/2 in. and greater	0.75	0.60	0.50
Triple glass			
1/4 in. air space	0.72	0.57	0.48
3/8 in. air space	0.68	0.53	0.45
1/2 in. and greater	0.66	0.52	0.43
Triple glass or double glass with polyester film suspended in between, low emissivity = 0.15 on surface 2, 3, 4, or 5			
1/4 in. air space	0.67	0.52	0.44
3/8 in. air space	0.61	0.48	0.38
1/2 in. and greater	0.59	0.46	0.36
Triple glass, argon filled			
1/4 in. argon space	0.68	0.53	0.45
3/8 in. argon space	0.65	0.51	0.42
1/2 in. and greater	0.64	0.49	0.40
Triple glass or double glass with polyester film suspended in between, low emissivity = 0.15 on surface 2, 3, 4, or 5			
1/4 in. argon space	0.61	0.48	0.38
3/8 in. argon space	0.58	0.44	0.35
1/2 in. and greater	0.57	0.43	0.34

Table 63.18-3, Part III
Skylight U-Values - Horizontal

Glazing Type	Aluminum Frame-- no thermal break*	Aluminum Frame-- thermal break*	Wood or Vinyl Frame
Single glazing			
Glass	1.38	1.25	1.12
1/8 in. acrylic	1.31	1.17	1.06
Double glass, air filled			
1/4 in. air space	0.91	0.77	0.67
3/8 in. air space	0.86	0.72	0.62
1/2 in. and greater	0.84	0.71	0.60
Double glass, low emissivity = 0.4 on surface 2 or 3			
1/4 in. air space	0.85	0.71	0.61
3/8 in. air space	0.79	0.65	0.56
1/2 in. and greater	0.77	0.63	0.53
Double glass, low emissivity = 0.15 on surface 2 or 3			
1/4 in. air space	0.80	0.67	0.57
3/8 in. air space	0.74	0.59	0.50
1/2 in. and greater	0.72	0.57	0.48
Double glass, argon filled			
1/4 in. argon space	0.86	0.73	0.62
3/8 in. argon space	0.83	0.69	0.59
1/2 in. and greater	0.81	0.68	0.58
Double glass, low emissivity = 0.4 on surface 2 or 3, argon filled			
1/4 in. argon space	0.79	0.65	0.56
3/8 in. argon space	0.75	0.60	0.51
1/2 in. and greater	0.74	0.59	0.50
Double glass, low emissivity = 0.15 on surface 2 or 3, argon filled			
1/4 in. argon space	0.74	0.59	0.50
3/8 in. argon space	0.69	0.54	0.44
1/2 in. and greater	0.67	0.53	0.43
Double glazing, 1/8 in. acrylic or polycarbonate			
1/4 in. air space	0.86	0.73	0.62
3/8 in. air space	0.83	0.69	0.59
1/2 in. and greater	0.81	0.68	0.58
Double glazing, 1/4 in. acrylic or polycarbonate			
1/4 in. air space	0.83	0.69	0.59
3/8 in. air space	0.80	0.65	0.56
1/2 in. and greater	0.78	0.64	0.54
Triple glass			
1/4 in. air space	0.76	0.61	0.52
3/8 in. air space	0.72	0.57	0.49
1/2 in. and greater	0.70	0.56	0.47
Triple glass or double glass with polyester film suspended in between, low emissivity = 0.15 on surface 2, 3, 4, or 5			
1/4 in. air space	0.71	0.56	0.48
3/8 in. air space	0.65	0.52	0.42
1/2 in. and greater	0.63	0.50	0.40
Triple glass, argon filled			
1/4 in. argon space	0.72	0.57	0.49
3/8 in. argon space	0.69	0.55	0.46
1/2 in. and greater	0.68	0.53	0.44
Triple glass or double glass with polyester film suspended in between, low emissivity = 0.15 on surface 2, 3, 4, or 5			
1/4 in. argon space	0.65	0.52	0.42
3/8 in. argon space	0.62	0.48	0.39
1/2 in. and greater	0.61	0.47	0.38

* Note to Table 63.18-3: An aluminum thermal break framed window shall incorporate the following minimum design characteristics:

a. The thermal conductivity of the thermal break material shall be not more than 3.6 Btu-in/hr/ft^2/F°;

b. The thermal break material shall not be less than 0.210 inches; and

c. All metal framing members of the product to interior and exterior air must incorporate a thermal break meeting the criteria in a. and b. above.

(3) GROSS AREA OF ENVELOPE COMPONENTS.

(a) *Roof assembly.* The gross area of a roof assembly consists of the total surface of the roof assembly exposed to outside air or unconditioned spaces. The roof assembly shall be considered to include all roof or ceiling components through which heat may flow between indoor and outdoor environments including skylight surfaces but excluding service openings. For thermal transmittance purposes when return air ceiling pleonasm are employed, the roof or ceiling assembly shall not include the resistance of the ceiling or the plenum space as part of the total resistance of the assembly.

(b) *Floor assembly.* The gross area of a floor assembly over outside or unconditioned spaces consists of the total surface of the floor assembly exposed to outside air or unconditioned space. The floor assembly shall include all floor components through which heat may flow between indoor and outdoor or unconditioned space environments.

(c) *Exterior walls.* The gross area of exterior walls enclosing a heated or cooled space is measured on the exterior and consists of the opaque wall including between floor spandrels, peripheral edges of flooring, window areas including sash, and door areas, but excluding vents, grilles, and pipes.

(4) SHADING COEFFICIENTS. The Shading Coefficient (SCx) for fenestration shall be obtained from the ASHRAE Handbook, Fundamentals Volume or from manufacturer's test data. SC_X is the Shading Coefficient of the fenestration including permanently installed internal and external shading devices but excluding the effect of external shading projections, which is calculated separately. The Shading Coefficient used for louvered shade screens shall be determined using a profile angle of 30° as found in the ASHRAE Handbook, Fundamentals Volume.

Note: Manufacturers should be able to provide shading coefficients for their products.

COMM 63.19 PROHIBITION OF HEATED SIDEWALKS.

The installation or use of heated sidewalks is prohibited as specified in s. 101.124, Stats.

Note: Section 101.124, Stats., reads as follows:

101.124 Heated Sidewalks Prohibited. In this section "exterior pedestrian traffic surface" means any sidewalk, ramp, stair, stoop, step, entrance way, plaza or pedestrian bridge not fully enclosed within a building and "heated" means heated by electricity or energy derived from the combustion of fossil fuels, but not including the use of waste thermal energy. "Exterior pedestrian traffic surface" does not include any means of ingress or egress by the physically disabled required under s. 101.13 (2). No person may construct a heated exterior pedestrian traffic surface. The department or any city, village, town or county is prohibited from approving any plan under s. 101.12 which includes such heated surface. The department shall order any existing heated exterior pedestrian traffic surface in operation to be shut off. This section does not apply to any inpatient health care facility as defined in s. 50.135 (1), or community-based residential facility, as defined in s. 50.01 (1g).

Subchapter IV — Equipment And Systems

Part 1 - Equipment Efficiencies

COMM 63.20 MINIMUM EQUIPMENT EFFICIENCIES.

(1) Space heating or cooling equipment that is not covered by 10 CFR Part 430, Energy Conservation Program for Consumer Products, shall have a minimum efficiency at the specified rating conditions not less than the values given in ASHRAE 90.1, section 10.4.1.

Note: Equipment that is covered by the federal regulation 10 cfr Part 430 is not included under the scope of this code. Efficiencies required by that standard are reprinted in Appendix A. Efficiencies required by ASHRAE 90.1-1989 are also printed in Appendix A.

(2) Equipment ratings shall be certified under a nationally recognized certification program or rating procedure or data furnished by the equipment manufacturer to show compliance with the minimum efficiency requirements.

Note: The following certification programs are accepted by the department: GAMMA and ARI.

(3) Compliance with minimum efficiency requirements specified for HVAC equipment shall include compliance with part-load requirements where indicated as well as standards for full-load requirements. The part-load efficiency shall be determined as specified in the ARI standards specified in ASHRAE 90.1.

(4) Space heating or cooling equipment used to provide additional functions such as water heating for plumbing, as part of a combination or integrated system shall comply with minimum performance requirements for the appropriate space heating or cooling equipment category.

(5) Equipment providing water heating for plumbing that is used to provide additional functions, such as space heating, as part of a combination or integrated system shall comply with minimum performance requirements for water heating equipment as specified in s. COMM 84.20 (5)(n).

(6) Combination space and plumbing water heating equipment may only be used when at least one of the following conditions is met:

(a) The annual space heating energy is less than 50% of the annual water heating energy for plumbing.

(b) The energy input or storage volume of the combined boiler or water heater is less than twice the energy input or storage volume of the smaller of the separate boilers or water heaters otherwise required.

(c) The combined system uses no more energy than separate systems that meet the requirements of this section.

(d) The input to the combined boiler or water heater system is less than 150,000 Btu/h.

Note: See s. COMM 64.22 (10) for additional requirements for combined systems.

(7) Equipment that is not used for comfort cooling or comfort heating is exempt from the energy efficiency requirements of this chapter.

Note: Omission of minimum performance requirements for certain classes of HVAC equipment does not preclude use of that equipment.

COMM 63.21 FIELD-ASSEMBLED EQUIPMENT AND COMPONENTS.

When components such as indoor or outdoor coils are used from more than one manufacturer as parts of air-conditioning or heating equipment, component efficiencies shall be specified based on data provided by the component manufacturers.

COMM 63.22 EQUIPMENT CONTROLS.

(1) Heat pumps equipped with supplementary heaters shall be installed with controls to prevent heater operation when the heating load can be met by the heat pump, except under the conditions listed below:

(a) Where it can be shown that supplementary heating reduces energy consumption.

(b) Supplementary heater operation is permitted during short transient periods of less than 15 minutes during defrost cycles.

(2) The setback recovery and tempering of indoor air during defrost cycles shall be controlled so as to minimize use of supplemental heat.

Part 2 - System Design

COMM 63.23 LOAD CALCULATIONS FOR SIZING.

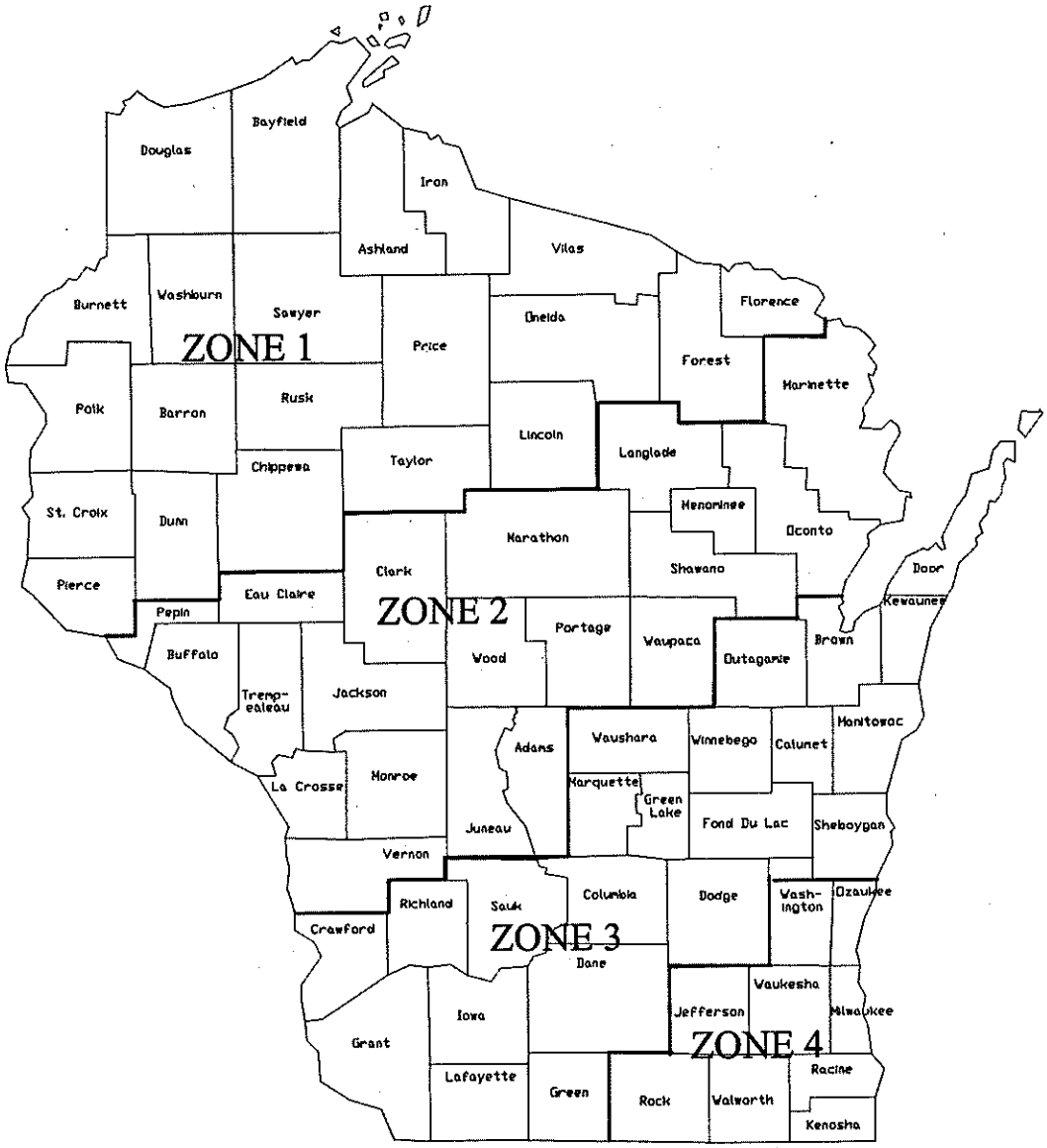
(1) CALCULATION PROCEDURES. Heating and cooling system design loads for the purpose of sizing systems and equipment shall be determined in accordance with the procedures described in the ASHRAE Handbook, Fundamentals Volume, or a similar computation procedure approved by the department. For those design parameters addressed in subs (2) to (7), the values specified shall be used.

Note: This section does not require the installation of cooling equipment.

(2) INDOOR DESIGN CONDITIONS. The winter indoor design temperature is specified in Table 64.05. When air conditioning is provided in accordance with s. COMM 64.06 (2)(b), the summer indoor design temperature is 78°F or lower.

(3) OUTDOOR DESIGN CONDITIONS. Outdoor design temperatures shall be taken from Figure 63.23.

Figure 63.23
Outdoor Design Conditions



Zone	Winter Design Temp. (°F)	Summer Dry Bulb (°F)	Summer Wet Bulb (°F)
1	-25	86	75*
2	-20	87	75
3	-15	87	75
4	-10	89	77

*Exception: For Douglas, Bayfield, Ashland and Iron Counties, use 70°F summer wet bulb design temperature.

(4) VENTILATION. Outdoor air ventilation loads shall be based on ventilation rates specified in s. COMM 64.05.

(5) ENVELOPE. Envelope heating and cooling loads shall be based on envelope characteristics such as thermal conductance, shading coefficient, and air leakage consistent with the values used to demonstrate compliance with subchapter III.

(6) LIGHTING. Lighting loads shall be based on actual design lighting levels or power budgets consistent with Subchapter V. Lighting loads may not be included for the purpose of calculating design heating loads.

(7) PICK-UP LOADS. Transient loads such as warm-up or cool-down loads which occur after off-hour setback or shutoff may be calculated from principles based on the heat capacity of the building and its contents, the degree of setback, and desired recovery time; or may be assumed to be up to 30% for heating and 10% for cooling of the steady-state design loads.

COMM 63.24 SYSTEM AND EQUIPMENT SIZING.

HVAC systems and equipment shall be sized to provide the minimum space and system loads calculated in accordance with s. COMM 63.23.

COMM 63.25 SEPARATE AIR DISTRIBUTION SYSTEMS.

(1) Except as provided in sub. (2), zones with special process temperature requirements, humidity requirements, or both, shall be served by air distribution system separate from those serving zones requiring only comfort conditions; or shall include supplementary provisions so that the primary systems may be specifically controlled for comfort purposes only.

(2) As an exception to sub. (1), zones requiring only comfort heating or comfort cooling that are served by a system primarily used for process temperature and humidity control need not be served by a separate system if the total supply air to these comfort zones is no more than 25% of the total system supply air or the total conditioned floor area of the zones is less than 1,000 square feet.

COMM 63.26 TEMPERATURE CONTROLS.

(1) SYSTEM CONTROL. Each HVAC system shall include at least one temperature control device.

(2) ZONE CONTROLS.

(a) 1. Except as provided in subd. 2., the supply of heating and cooling energy to each zone shall be controlled by individual thermostatic controls responding to temperature within the zone.

2. Independent perimeter systems that are designed to offset only envelope heat losses or gains or both may serve one or more zones also served by an interior system with the following limitations:

a. The perimeter system shall include at least one thermostatic control zone for each building exposure having exterior walls facing only one orientation for 50 contiguous feet or more; and

b. The perimeter system heating and cooling supply shall be controlled by thermostats located within the zones served by the system.

(b) Where used to control comfort heating, zone thermostatic controls shall be capable of being set locally or remotely by adjustment or selection of sensors down to 55°F or lower.

(c) Where used to control comfort cooling, zone thermostatic controls shall be capable of being set locally or remotely by adjustment or selection of sensors up to 85°F or higher.

(d) Except as provided in subds. 1. to 3., zone thermostatic controls used to control both comfort heating and cooling shall be capable of providing a temperature range, or deadband, of at least 5°F within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum.

1. Deadbands are not required for special occupancy, special usage, or code-required systems where deadband controls are not appropriate.

2. Deadbands are not required for buildings complying with the ASHRAE energy cost budget method under Subchapter VII if, in the proposed building energy analysis, heating and cooling thermostat set-points are set to the same value between 70°F and 75°F inclusive and assumed to be constant throughout the year.

3. Deadbands may be omitted for thermostats that have manual changeover between heating and cooling modes.

COMM 63.27 ZONE CONTROLS.

(1) Except as provided in sub. (2), zone thermostatic and humidistatic controls shall be capable of operating in sequence to supply heating and cooling energy to the zone. Such controls shall prevent:

(a) Reheating;

(b) Recooling;

(c) Mixing or simultaneous supply of air that has been previously mechanically heated and air that has been previously cooled, either by mechanical refrigeration or by economizer systems; or

(d) Other simultaneous operation of heating and cooling systems to the same zone.

(2) The following systems and zones are exempt from this section:

(a) Variable air volume (VAV) systems which, during periods of occupancy, are designed to reduce the air supply to each zone to a minimum before reheating, recooling, or mixing takes place. This minimum volume shall be no greater than the largest of the following:

1. 30% of the peak supply volume;

2. The minimum required to meet ventilation requirements of s. COMM 64.05;

3. 0.4 cfm/square foot of zone conditioned floor area.

(b) Zones where special pressurization relationships or cross-contamination requirements are such that the cost of controls for variable air volume systems exceeds the value of the energy saved, such as some areas of hospitals and laboratories;

(c) Where at least 75% of the energy for reheating or for providing warm air in mixing systems is provided from a site-recovered or site-solar energy source.

(d) Zones where specified humidity levels are required to satisfy process needs, such as computer rooms and museums; and

(e) Zones with a peak supply air quantity of 150 cfm or less.

(f) Multiple reheat systems serving multiple zones, other than those employing variable air volume for temperature control, that are provided with controls that will automatically reset

the system cold air supply to the highest temperature level that will satisfy the zone requiring the coolest air.

(g) Dual duct and multizone systems that are provided with controls that will automatically reset:

1. The cold duct air supply to the highest temperature that will satisfy the zone requiring the coolest air; and

2. The hot duct air supply to the lowest temperature that will satisfy the zone requiring the warmest air.

(h) Systems in which heated air is recooled, directly or indirectly, to maintain space temperature that are provided with controls that will automatically reset the temperature to which the supply air is heated to the lowest level that will satisfy the zone requiring the warmest air.

(i) A multiple zone heating, ventilating and air-conditioning system that employs reheating or recooling for control of not more than 5,000 cfm or 20% of the total supply air of the system, whichever is less.

(3) OFF-HOUR CONTROLS. Except as provided in pars. (a) to (c), mechanical HVAC systems shall be equipped with automatic controls capable of accomplishing a reduction of energy use through control setback or equipment shutdown during periods of nonuse or alternate use of the zones served by the system. The following systems are exempt from this subsection:

(a) Systems serving areas expected to operate continuously;

Question. *Does a hotel guest room fan-coil require individual setback controls?*

Answer: *No. Hotel guest rooms, while not actually continuously occupied, are continuously available for occupancy and thus fall under exception (a). However, systems that automatically set-back (or set-up) thermostat setpoints on the thermostat when rooms are not in use may be cost effective.*

Multi-family dwellings are required to have setback control capability.

(b) Where it can be shown that setback or shutdown will not result in a decrease in overall building energy costs; or

(c) Equipment with full load demands of 2 kW or 6826 Btu/h or less may be controlled by readily accessible manual off-hour controls.

COMM 63.28 HUMIDITY CONTROL.

If a system is equipped with a means for adding moisture to maintain specific humidity levels in a zone or zones, a humidistat shall be provided.

COMM 63.29 INSULATION, MATERIALS AND CONSTRUCTION.

(1) GENERAL. Insulation required by subs. (2) and (3) shall be suitably protected from damage.

Note: Insulation should be installed in accordance with practices acceptable to the department such as MICA Commercial and Industrial Insulation Standards.

(2) PIPING INSULATION. Except as provided in pars. (a) to (c), recirculating plumbing system piping, plumbing piping in the first 8 feet from storage tanks for noncirculating systems, any piping served by a self-regulating electric heating cable, HVAC system piping, and related HVAC fluid conveying conduit, such as heat exchanger bodies, shall be thermally insulated in

accordance with Table 63.29-1 or equivalent. The following piping or conduit is exempted from this subsection:

(a) Factory-installed piping or conduit within HVAC equipment tested and rated in accordance with s. COMM 63.20;

(b) Piping or conduit for which no insulation is specified in Table 63.29-1.

(c) Where it can be shown that the heat gain or heat loss to or from piping or conduit without insulation will not increase building energy use.

Note: For equivalent insulation levels using alternative insulation types, the calculation procedure specified in A63.29 of Appendix A is acceptable to the department.

Table 63.29-1

Plumbing and HVAC Piping Minimum Insulation (in.)[a,b]

Fluid Operating Temperature Range, °F	Nominal Pipe Diameter (in.)					Insulation Conductivity	
	1 and Less	1-1 1/4 to 2	2-1/2 to 4	5 and 6	8 and up	Conductivity Range Btu•in./(h•ft^3•°F)	Mean Rating Temperature °F
Hot Systems (Steam, Steam Condensate, and Hot Water)							
Above 350	2.5	2.5	3.0	3.5	3.5	0.32 - 0.34	250
251 - 350	2.0	2.5	2.5	3.5	3.5	0.29 - 0.31	200
201 - 250	1.5	1.5	2.0	2.0	3.5	0.27 - 0.30	150
141 - 200	1.5	1.5	1.5	1.5	1.5	0.25 - 0.29	125
105 - 140	1.0	1.0	1.0	1.5	1.5	0.24 - 0.28	100
80 - 104	0.5	0.5	0.5	1.0	1.0	0.24 - 0.28	100
Cold Systems (Chilled Water, Brine, and Refrigerant)[c]							
40 - 55	0.5	0.75	1.0	1.0	1.0	0.23 - 0.27	75
Below 40	1.0	1.5	1.5	1.5	1.5	0.23 - 0.27	75

[a] For minimum thicknesses of alternative insulation types, see Appendix A.

[b] Plumbing piping systems without a heat trap to prevent circulation due to natural convection shall be considered circulating systems.

[c] The required minimum thicknesses do not consider water vapor transmission and condensation. Additional insulation, vapor retarders, or both, may be required to limit water vapor transmission and condensation.

The previous Table 63.29-1 has been modified for direct use with industry R-values:

Table 63.29-1 (Modified)

Plumbing and HVAC Piping Minimum Insulation (R-Value)[a,b]

Fluid Operating Temperature Range, °F	Nominal Pipe Diameter (in.)					Insulation Conductivity	
	1 and Less	1-1 1/4 to 2	2-1/2 to 4	5 and 6	8 and up	Conductivity Range Btu•in./(h•ft²•°F)	Mean Rating Temperature °F
Hot Systems (Steam, Steam Condensate, and Hot Water)							
Above 350	7.4	8.9	8.9	10.3	10.3	0.32 - 0.34	250
251 - 350	6.5	8.1	8.1	11.3	11.3	0.29 - 0.31	200
201 - 250	5.0	5.0	6.7	6.7	11.7	0.27 - 0.30	150
141 - 200	5.2	5.2	5.2	5.2	5.2	0.25 - 0.29	125
105 - 140	3.6	3.6	3.6	5.4	5.4	0.24 - 0.28	100
80 - 104	1.8	1.8	1.8	3.6	3.6	0.24 - 0.28	100
Cold Systems (Chilled Water, Brine, and Refrigerant)[c]							
40 - 55	1.9	2.8	3.7	3.7	3.7	0.23 - 0.27	75
Below 40	3.7	5.6	5.6	5.6	5.6	0.23 - 0.27	75

(3) AIR-HANDLING SYSTEM INSULATION. All air-handling ducts and plenums installed as part of an HVAC air distribution system shall be thermally insulated in accordance with Table 63.29-2, except where it can be shown that the heat gain to or heat loss from ducts without insulation will not increase building energy use.

Table 63.29-2

Minimum Duct Insulation[a]

Duct Location	Cooling[b] Insulation R-Value[d] (h•ft²•°F)/Btu	Heating[c] Insulation R-Value[d] (h•ft²•°F)/Btu
Exterior of Building	5.0	9.0
Interior[g]		
$Td^e \leq 15$	None Required	None Required
$40 \geq Td^e > 15$	3.3	3.3
$Td^e > 40$	5.0[f]	5.0[f]

[a] Insulation R-values shown are for the insulation as installed and do not include film resistance. The required minimum thicknesses do not consider water vapor transmission and condensation. Additional insulation, vapor retarders, or both, may be required to limit vapor transmission and condensation. For ducts which are designed to convey both heated and cooled air, duct insulation shall be as required by the most restrictive condition. Where exterior walls are used as plenum walls, wall insulation shall be as required by the most restrictive condition of this section or Subchapter III.

[b] Cooling ducts are those designed to convey cooled air or return ducts in such systems.

[c] Heating ducts are those designed to convey heated air or return ducts in such systems.

[d] Insulation resistance measured on a horizontal plane in accordance with ASTM C518 at a mean temperature of 75°F at the installed thickness.

[e] TD is defined as the temperature difference at design conditions (see s. COMM 63.25) between the space within which the duct is located and the design air temperature in the duct.

[f] Insulation resistance for runouts to terminal devices less than 10 feet in length need not exceed 3.3 (h ft^2 °F)/Btu.

[g] Interior ducts include any ducts inside the building thermal envelope. Exterior ducts include ducts in unconditioned spaces such as crawlspaces and attics.

For underground duct insulation, the surrounding medium (ground) temperature for ducts within the building perimeter shall be considered 40°F. and for ducts outside the building perimeter shall be considered 30°F.

COMM 63.31 ECONOMIZER CONTROLS.

(1) Except as provided in sub. (2), each fan system shall be designed and capable of being controlled to take advantage of favorable weather conditions to reduce mechanical cooling requirements. The system shall include either of the following:

(a) A temperature or enthalpy air economizer system which is capable of automatically modulating outside air and return air dampers to provide 100% of the design supply air quantity as outside air for cooling;

(b) A water economizer system which is capable of cooling supply air by direct evaporation, indirect evaporation, or both. Such a system shall be designed and capable of being controlled to provide 100% of the expected system cooling load at outside air temperatures of 50°F dry-bulb/45°F wet-bulb and below.

(2) The following systems are exempt from this subsection:

(a) Individual fan-cooling units with a supply capacity of less than 2,000 cfm or a total system cooling capacity of less than 62,000 Btu/hour for split systems or less than 55,000 Btu/hour for all other types. The total capacity of all such units complying by use of this exception shall not exceed 600,000 Btu/hour per building or 10% of the total installed cooling capacity, whichever is larger;

(b) Systems with air or evaporatively cooled condensers for which it can be shown that the use of outdoor air cooling affects the operation of other systems, such as humidification, dehumidification, or supermarket refrigeration systems, so as to increase overall building energy costs;

Note: Other areas that may use controlled humidification or dehumidification are computer rooms, museums, library stacks and drafting rooms.

(c) Where the overall building energy use resulting from alternative designs, such as internal to external zone heat recovery systems, can be shown to be less than those resulting from an economizer system.

COMM 63.32 ELECTRICAL MOTORS.

(1) Any permanently wired motor that meets all of the criteria specified in pars. (a) through (g) shall meet the efficiency requirements specified in Table 63.32 and the requirements of this section.

(a) The motor is used in a HVAC fan or pumping system;

(b) The motor is polyphase;

(c) The motor is one horsepower or more;

(d) The motor is a design A or B squirrel-cage, foot-mounted, T-frame induction motor that has synchronous speeds of 3600, 1800, 1200, and 900 rpm;

(e) The motor is expected to operate more than 1000 hours per year;

(f) The motor is not a multispeed motor used in a system designed to use more than one speed; and

(g) The motor is not a component of equipment that meets the efficiency requirements of s. COMM 63.20 and the motor input is included in the determination of the equipment efficiency.

(2) The motor nameplate shall list the minimum nominal full-load motor efficiency.

Note: Motors that are classified as "energy efficient" under the National Electric Manufacturer's Association Standard MG 12.55, dated 3-14-91, are acceptable to the department as meeting the efficiency requirements of this section.

A pump or fan motor used in a built up HVAC system must meet the energy efficiency requirements of Table 63.32.

Motors used for replacement purposes may not be less efficient than the motor it is replacing in order to maintain the existing equipment's listed efficiency.

Table 63.32
Minimum Acceptable Nominal Full-Load Motor Efficiency For Single-Speed Polyphase Squirrel-Cage Induction Motors Having Synchronous Speeds of 3600, 1800, 1200 and 990 rpm

Full-Load Efficiencies—Open Motors								
HP	2-Pole		4-Pole		6-Pole		8-Pole	
	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency
1.0	--	--	82.5	81.5	80.0	78.5	74.0	72.0
1.5	82.5	81.5	84.0	82.5	84.0	82.5	75.5	74.0
2.0	84.0	82.5	84.0	82.5	85.5	84.0	85.5	84.0
3.0	84.0	82.5	86.5	85.5	86.5	85.5	86.5	85.5
5.0	85.5	84.0	87.5	86.5	87.5	86.5	87.5	86.0
7.5	87.5	86.5	88.5	87.5	88.5	87.5	88.5	87.5
10.0	88.5	87.5	89.5	88.5	90.2	89.5	89.5	88.5
15.0	89.5	88.5	91.0	90.2	90.2	89.5	89.5	88.5
20.0	90.5	89.5	91.0	90.2	91.0	90.2	90.2	89.5
25.0	91.0	90.2	91.7	91.0	91.7	91.0	90.2	89.5
30.0	91.0	90.2	92.4	91.7	92.4	91.7	91.0	90.2
40.0	91.7	91.0	93.0	92.4	93.0	92.4	91.0	90.2
50.0	92.4	91.7	93.0	92.4	93.0	92.4	91.7	91.0
60.0	93.0	92.4	93.6	93.0	93.6	93.0	92.4	91.7
75.0	93.0	92.4	94.1	93.6	93.6	93.0	93.6	93.0
100.0	93.0	92.4	94.1	93.6	94.1	93.6	93.6	93.0
125.0	93.6	93.0	94.5	94.1	94.1	93.6	93.6	93.0
150.0	93.6	93.0	95.0	94.5	94.5	94.1	93.6	93.0
200.0	94.5	94.1	95.0	94.5	94.5	94.1	93.6	93.0
Full-Load Efficiencies—Enclosed Motors								
HP	2-Pole		4-Pole		6-Pole		8-Pole	
	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency	Nominal Efficiency	Minimum Efficiency
1.0	75.5	74.0	82.5	81.5	80.0	78.5	74.0	72.0
1.5	82.5	81.5	84.0	82.5	85.5	84.0	77.0	75.5
2.0	84.0	82.5	84.0	82.5	86.5	85.5	82.5	81.5
3.0	85.5	84.0	87.5	86.5	87.5	86.5	84.0	82.5
5.0	87.5	86.5	87.5	86.5	87.5	86.5	85.5	84.0
7.5	88.5	87.5	89.5	88.5	89.5	88.5	85.5	84.0
10.0	89.5	88.5	89.5	88.5	89.5	88.5	88.5	87.5
15.0	90.2	89.5	91.0	90.2	90.2	89.5	88.5	87.5
20.0	90.2	89.5	91.0	90.2	90.2	89.5	89.5	88.5
25.0	91.0	90.2	92.4	91.7	91.7	91.0	89.5	88.5
30.0	91.0	90.2	92.4	91.7	91.7	91.0	91.0	90.2
40.0	91.7	91.0	93.0	92.4	93.0	92.4	91.0	90.2
50.0	92.4	91.7	93.0	92.4	93.0	92.4	91.7	91.0
60.0	93.0	92.4	93.6	93.0	93.6	93.0	91.7	91.0
75.0	93.0	92.4	94.1	93.6	93.6	93.0	93.0	92.4
100.0	93.6	93.0	94.5	94.1	94.1	93.6	93.0	92.4
125.0	94.5	94.1	94.5	94.1	94.1	93.6	93.6	93.0
150.0	94.5	94.1	95.0	94.5	95.0	94.5	93.6	93.0
200.0	95.0	94.5	95.0	94.5	95.0	94.5	94.1	93.6

Subchapter V — Lighting

COMM 63.40 SCOPE.

Sections 63.41 to 63.51 shall apply to the following rooms, spaces and areas:

(1) Interior spaces of buildings;

(2) Building exteriors and exterior areas such as entrances, exits, loading docks; and

(3) Roads, grounds, parking, and other exterior areas where lighting is energized through the building electrical service.

Note: See Appendix for worksheets.

The purpose of this code is to limit power to exterior and interior spaces. IES/NA recommended illumination levels may be achieved with efficient lighting sources. This code does not supersede local ordinances. Local ordinances may be stricter.

COMM 63.41 EXTERIOR LIGHTING POWER REQUIREMENT.

The exterior lighting power of a building or a group of buildings in a multibuilding facility calculated in accordance with s. COMM 63.42 shall be no greater than the lighting power allowance calculated in accordance with s. COMM 63.43.

COMM 63.42 CALCULATION OF EXTERIOR LIGHTING POWER.

The calculated exterior lighting power is the sum of the power for all exterior luminaires that are included in the scope of this subchapter, s. COMM 63.40, minus the power for exempted exterior lighting as specified in subs. (1) to (5):

(1) Task lighting for outdoor activities such as manufacturing, commerce, and processing facilities.

Both self-contained and exterior illumination for signs are exempt from the exterior lighting power calculations. For lighting systems that provide both sign and building illumination, only the area of the sign and the fraction of power required for sign illumination is exempt.

Automotive dealer parking areas that are used exclusively for selling vehicles are exempt from the exterior lighting power calculations. However, all parking areas that involve automotive vehicles which are NOT sold, such as customer parking areas, employee parking areas, car repair areas, etc. must be included in the exterior lighting calculations, and must demonstrate code compliance.

(2) Lighting power for theatrical productions.

(3) Lighting for outdoor athletic facilities, including playing and seating areas.

(4) Lighting for dwelling units that is controlled within the dwelling unit.

(5) Exit way or egress lighting required by COMM 73.21 that has switching regulated by Article 700 of the National Electrical Code as adopted by reference in Ch. Comm 16.

COMM 63.43 EXTERIOR LIGHTING POWER ALLOWANCE.

(1) CALCULATION METHOD. The exterior lighting power allowance for a building or a multibuilding facility is the sum of all the allowed lighting powers for all exterior areas. The lighting power for each area is calculated by multiplying the unit power allowance from Table 63.43 by the applicable length or area.

(2) APPLICABLE AREAS AND LENGTHS. The applicable areas and lengths used with Table 63.43 to calculate the exterior lighting power allowance are described in pars. (a) to (d).

(a) Horizontal areas of grounds, driveways, lots, gardens or parks may be calculated as if they were flat, or the actual area of the surfaces of contours may be used.

(b) Canopied areas are the area of the horizontal surface under the canopy. A canopy includes an exterior awning, soffit or ornamental or functional structure signifying a main entrance to a building.

A canopied entry to a building would be measured from the plan view - not by the sloped (or painted) surface area.

For the purposes of this code gas pump and drive-up window canopies are not included with the exterior lighting power requirements, but are allowed 4 W/ft^2 under COMM 63.49 of the interior lighting power requirements.

Canopies that have business names or logos on them are not considered commerce lighting and are not exempt. Lighted signs attached to the canopy (neon sign) are exempt as commerce lighting.

(c) The linear length of door openings is measured in plan view and includes the door opening only. Sidelights and other portions of the door which do not open are not included.

(d) The applicable area of the building facade includes all vertical and horizontal areas that are intended to be illuminated.

Only the areas that are actually lit may be used in determining exterior wall illumination areas. If a window were under the illuminated area, it would be counted with the wall area. If the lighting were used near a door (for egress), 63.43(c) would apply.

Table 63.43

Exterior Lighting Unit Power Allowances

Area Description	Allowances
Exit (with or without canopy)	25 W/lin ft of door opening
Entrance (without canopy)	30 W/lin ft of door opening
Entrance (with canopy)	
High traffic (retail, hotel, airport, theater, etc.)	10 W/ft^2 of canopied area
Light traffic (hospital, office, school, etc.)	4 W/ft^2 of canopied area
Loading area	0.40 W/ft^2
Loading door	20 W/lin ft of door opening
Building exterior surfaces/facades	0.25 W/ft^2 of surface area to be illuminated
Storage and nonmanufacturing work areas	0.20 W/ft^2
Other activity areas for casual use such as picnic grounds, gardens, parks and other landscaped areas.	0.10 W/ft^2
Private driveways/walkways	0.10 W/.ft^2
Public driveways/walkways	0.15 W/ft^2
Private parking lots	0.12 W/ft^2
Public parking lots	0.18 W/ft^2

A public driveway is used by the general public. A private driveway is intended for use solely by the employees or tenants. Exits are doors or groups of doors to a building not ordinarily used as an entrance and primarily used in an emergency, nighttime, or convenience exit.

An allowance for exterior lighting power is given in any of the categories above (except for building exterior surfaces/facades), regardless of whether lighting fixtures are installed. For example, an allowance may be claimed for loading door lighting even if the loading door is not illuminated.

COMM 63.44 INTERIOR LIGHTING POWER REQUIREMENT.

The interior lighting power of a building calculated in accordance with s. COMM 63.45 shall be no greater than the interior lighting power allowance calculated in accordance with s. COMM 63.46.

COMM 63.45 CALCULATION OF INTERIOR LIGHTING POWER.

The calculated interior lighting power of a building is the total watts of all interior luminares including, but not limited to, track and flexible lighting systems, lighting that is integral with modular furniture, movable displays and cabinets, and internally illuminated case work for task or display purposes, minus any adjustments allowed under subs. (1) through (4).

Interior and exterior lighting power allowances may NOT be traded off. Exterior lighting power allowances which go unused may NOT be applied to the interior lighting power allowance, and vice versa.

(1) MULTIPLE INTERLOCKED LIGHTING SYSTEMS SERVING A SPACE. When multiple interlocked lighting systems serve a space, the watts of all systems except the system with the highest wattage may be excluded from the calculated lighting power if:

(a) The lighting systems are interlocked to prevent simultaneous operation; or

(b) The lighting systems are controlled by a preset dimming system or other device that prevents simultaneous operation of more than one lighting system, except under the direct control of authorized personnel.

(2) REDUCTION OF WATTAGE THROUGH CONTROLS. The watts of any luminaire that is controlled may be reduced by the number of watts times the applicable power adjustment factor from Table 63.45 if:

(a) The control complies with s. COMM 63.51; and

(b) At least 50 percent of the light output of the luminaire is within the applicable space listed in Table 63.45; and

(c) Except as noted in Table 63.45, only one power adjustment factor is used for the luminaire; and

(d) For daylighting control credits, the luminaire is controlled by the daylighting control, and the luminaire is located within the daylit area; and

(e) For automatic time switch control devices, a timed manual override is provided at each switch location required by s. COMM 63.50. The override device shall control only the lights in the surrounding area enclosed by ceiling-height partitions.

Table 63.45
Lighting Power Adjustment Factors

Type of Control	Type of Space	Factor
Automatic daylighting controls	Daylit areas	
Continuous dimming		0.30
Multiple step dimming		0.20
On/off		0.10
Automatic time switch control device in conjunction with automatic daylighting controls	Daylit areas ≤ 250 square feet	
Continuous dimming		0.35
Multiple step dimming		0.25
On/off		0.15
Automatic time switch control device in conjunction with lumen maintenance and automatic daylighting controls	Daylit areas ≤ 250 square feet	
Continuous dimming		0.40
Multiple step dimming		0.30
On/off		0.20
Lumen maintenance	Any space	0.10

Type of Control	Type of Space	Factor
Lumen maintenance in conjunction with an automatic time switch control device	Space ≤ 250 square feet	0.15
Automatic time switch control device	Spaces ≤ 250 square feet	0.15
Occupant-sensing device with a separate sensor for each space	Spaces ≤ to 250 square feet enclosed by opaque floor-to-ceiling partitions; any size classroom, corridor, conference or waiting room	0.30*
Occupant-sensing device with separate sensor for each space	Rooms of any size that are used exclusively for storage	0.60*
Occupant-sensing device with separate sensor for each space	Spaces > 250 square feet	0.10*
Occupant-sensing device with a separate sensor for each space used in conjunction with daylighting controls and separate sensor for each space	Spaces ≤ 250 square feet within a daylit area and enclosed by opaque floor-to-ceiling partitions	
Continuous dimming		0.40*
Multiple step dimming		0.35*
On/off		0.35*
Occupant-sensing device with a separate sensor for each space used in conjunction with daylighting controls and separate sensor for each space and lumen maintenance	Spaces ≤ 250 square feet within a daylit area and enclosed by opaque floor-to-ceiling partitions	0.35*
Continuous dimming		0.45*
Multiple step dimming		0.40*
On/off		0.35*
Occupant-sensing device with a separate sensor for each space used with lumen maintenance	Spaces ≤ 250 square feet and enclosed by opaque floor-to-ceiling partitions	0.35*
Occupant-sensing device with a separate sensor for each space used in conjunction with an automatic time switch control device	Spaces ≤ 250 square feet enclosed by opaque floor to ceiling partitions	0.35*
Manual dimming system	Hotels, motels, restaurants, auditoriums, theaters	0.10

Type of Control	Type of Space	Factor
Multiscene programmable dimming system	Hotels, motels, restaurants, auditoriums, theaters	0.20
Occupant-sensing device with programmable multiscene dimming system	Hotels, motels, restaurants, auditoriums, theaters	0.35

*Note to Table 63.45: Adjustment factors for occupant-sensing devices are for devices with on-off operation. If devices are used that turn lights down, rather than off, the adjustment factor shall be multiplied by the percent of energy savings that occur while the lights are turned down.

(3) LIGHTING WATTAGE EXCLUDED. The watts of the following lighting applications may be excluded from the calculated interior lighting power of the building.

(a) Lighting for theatrical productions and other live performances, television broadcasting, audio-visual presentations, and those portions of entertainment facilities such as stage areas in hotel ballrooms, night clubs, dance floors, and casinos where lighting is an essential technical element for the function performed, if the lighting is an addition to a general lighting system, and if the lighting is separately controlled and accessible only to authorized operators.

(b) Lighting for television, video and film production.

(c) Lighting for photographic processes.

(d) Lighting for theme parks.

(e) Lighting for exhibits in areas such as exhibit, convention, and hotel function areas, if the lighting is an addition to a general lighting system, and if the lighting is separately controlled and accessible only to authorized operators;

(f) Specialized local lighting installed in nonlighting process equipment by its manufacturer used to illuminate process related tasks only.

(g) In buildings for medical and clinical care, examination and surgical lights, low-level night lights, and lighting integral to medical equipment.

(h) Lighting fixtures that are an integral part of refrigeration equipment.

(i) Nonretail display lighting required for art exhibits or displays in galleries, museums and monuments.

(j) Special lighting needed for research.

(k) Task lighting for plant growth or maintenance, if it is equipped with an automatic 24-hour time switch that has program back-up capabilities that prevent the loss of the switch's program and time setting for at least 10 hours if power is interrupted.

(l) Exit way or egress illumination that is normally off.

(m) Task lighting specifically designed for primary use by visually impaired, for lip reading, and by senior citizens.

(n) Lighting for signs, including exit signs.

Note: See s. COMM 63.52 for exit sign requirements.

(o) Display window lighting in retail facilities provided the display area is separated from the store sales area by opaque ceiling-height partitions.

When retail displays are partitioned off from the interior of the stores, the lighting power from the display lighting may be excluded from the interior lighting power (installed) calculation. When this exclusion is taken, the floor area for the partitioned display may not be used in other area calculations. Display lighting control requirements (circuit power) of COMM 63.50(5) would apply.

(p) Lighting in dwelling units that provide complete independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking, and sanitation.

(q) In restaurant buildings and areas, lighting for food warming or integral to food preparation equipment;

(r) Lighting equipment that is for sale;

(s) Lighting demonstration equipment in lighting education facilities.

(4) LIGHTING FIXTURES THAT ALLOW SUBSTITUTION OF SOURCES. The watts of track and other lighting fixtures that allow the substitution of low efficacy sources for high efficacy sources without altering the wiring of the fixture shall be determined by this subsection or other method approved by the department.

(a) *Track lighting.* The wattage of track lighting shall be determined by the method described in subd. 1. or 2.

1. The wattage of track lighting shall be the larger of the following two values:
   a. 45 watts per foot of track; or
   b. The total luminaire wattage proposed to operate on each track.

Question: *Six-8 ft. tracks are being installed in a retail strip mall store for lighting store displays. What is the wattage that is recorded for calculating the installed interior lighting power?*

Answer: *A minimum of 45 watts/ft of track must be used unless more wattage is being proposed to operate on each track. In this case, 45W x 8' x 6 tracks = 2,160 Watts or 360 W/track would be recorded.*

2. If interlocked switching is provided that limits the circuits that can be operated simultaneously, the wattage shall be the maximum luminaire wattage that can be operated simultaneously.

(b) *Incandescent medium base sockets.* The wattage for medium base fixtures shall be the listed lighting power capacity, in watts, of the fixture.

Note: See Appendix for default lamp/ballast wattages acceptable to the department.

Question: *A recessed ceiling or general lighting fixture is rated to accept an incandescent bulb with a maximum rating of 150 W. A 75 W incandescent bulb is proposed for use with the fixture. What is the installed wattage that must be recorded?*

Answer: *150W*

Note that the fixture trim is ignored, even if it restricts the size of the lamp that may be used. Fluorescent downlight fixtures which allow multiple lamp wattages must still use the listed power capacity of the fixture as the installed wattage.

COMM 63.46 CALCULATION OF INTERIOR LIGHTING POWER ALLOWANCE.

63.47

The interior lighting power allowance shall be calculated using one of the methods in s. COMM 63.47, 63.48, or 63.49 as applicable.

COMM 63.47 COMPLETE BUILDING METHOD.

The Complete Building Method may be used only on projects involving entire buildings where plans and specifications are submitted for the entire building and at least 80 percent of the areas of the building are the same type of use. Under this approach, the interior lighting power allowance is the lighting power density value in Table 63.47 times the conditioned floor area of the entire building. Hotel, motel and residential buildings shall not use this method. Building uses that are not listed in Table 63.47 shall be assigned the allowed lighting power density given under "All Others."

Do not use the complete building method with building additions or alterations unless the lighting for the entire building is submitted for review. At least 80 percent of the areas of the building must be of the same use.

Table 63.47
Complete Building Method
Lighting Power Density Values (Watts/ft^2)

Type of Use	Allowed Lighting Power Density
Banks and Financial Institutions	1.7
Correctional Housing	1.4
General Commercial and Industrial Work Buildings	1.2
Grocery Store	1.8
Industrial and Commercial Storage Buildings	0.8
Medical Buildings and Clinics	1.5
Office Building	1.5
Religious Worship, Auditorium, and Convention Centers	2.0
Restaurants	1.5
Retail and Wholesale Store	2.0
Schools	1.8
Theaters	1.5
All Others	0.8

COMM 63.48 AREA CATEGORY METHOD.

Under the Area Category Method, the interior lighting power allowance for the building is the sum of all allowed lighting powers for all areas in the building. The allowed lighting power for an area is the lighting power density in Table 63.48 times the area. For purposes of the Area Category Method, an "Area" means all contiguous spaces which accommodate or are associated with a single one of the primary functions listed in Table 63.48. Buildings with primary functions not listed in Table 63.48 shall not use this method. Where areas are bounded or separated by interior partitions, the floor space occupied by those interior partitions shall not be included in any area. The area shall not include enclosed retail display windows with exempted lighting as described in s. COMM 63.45 (3) (j). When the Area Category Method is used to calculate the interior lighting power allowance for an entire building, main entry lobbies, corridors, rest rooms, and support functions shall be treated as separate areas.

Table 63.48
Area Category Method - Lighting Power Density Values (Watts/ft^2)

Primary Function	Allowed Lighting Power Density
Auditorium	2.0
Bank/Financial Institution	1.8
Classrooms	2.0
Convention, Conference and Meeting Centers	1.6
Corridors, Rest Rooms and Support Areas	0.8
Detention Facilities	1.6
Dining	1.2
Exhibit	2.3
Storage Garage	0.2
General Commercial and Industrial Work	1.3
Grocery	2.0
Hotel Function	2.3*
Industrial and Commercial Storage	0.6
Kitchen	2.2
Laboratory	3.3
Living Unit or Guest Room	1.4
Lobbies:	
Hotel Lobby	2.3*
Main Entry Lobby	1.6*
Malls, Arcades, and Atria	1.2*
Medical and Clinical Care	1.8
Office	1.6
Precision Commercial and/or Industrial Work	2.0
Religious Worship	2.2*
Retail Sales, Wholesale Showrooms	2.2
Theaters	
Motion Picture	1.0
Performance	1.5*

* Note to Table 63.48: The smallest of the following values may be added to the allowed lighting power listed in Table 63.48 for ornamental chandeliers and sconces that are switched or dimmed on circuits different from the circuits for general lighting:

a. .1 watt per square foot times the area of the space in which the chandelier or sconce is used; or

b. The actual design wattage of the chandelier or sconce.

COMM 63.49 ACTIVITY METHOD.

Under the activity method, the interior lighting power allowance for a building is determined by calculating a lighting power budget for each space in accordance with subs. (1) to (4) and summing them in accordance with sub. (5).

(1) The lighting power budget of each interior space shall be determined in accordance with the equation given below:

$$LPB = A \times UPD \times AF$$

Where:

LPB = lighting power budget of the space, W
A = area of the space, ft^2
UPD = unit power density, W/ft^2 [Table 63.49]
AF = area factor of the room [Figure 63.49]

(a) The UPD shall be selected from Table 63.49. For applications to areas or activities other than those given, select values for the most similar areas or activities. The UPD for a multifunctional space shall be based on the lowest UPD of any of the activities of the space.

Table 63.49 lists Unit Power Densities for several common activities, however, not all activities will be listed. As a general rule, if you can't find a particular activity, ignore the main headings for activities and look in the sub-headings (indented portion) for the closest related activity.

(b) The area factor (AF) shall be determined from Figure 63.49 based on the room area (A_r) and ceiling height. The room area shall be calculated from the inside dimensions of the room. Rooms of identical ceiling height and activities may be evaluated as a group. The AF of a group of rooms shall be determined from the average area of these rooms.

An alternative to using the Area Factor table (Figure 63.49), would be to assume all spaces have an area factor of 1.0. This would be an acceptable conservative approach for demonstrating code compliance.

The equation below gives the formula used in developing Fig. 63.49.

$$AF = 0.2 + 0.8(1/0.9^n)$$

Where:

$$n = \left[\frac{10.21(CH - 2.5)}{\sqrt{A_r}} \right] - 1$$

AF = Area factor
CH = Ceiling height, ft.
A_r = Room area, ft^2

If AF < 1.0, then AF = 1.0
If AF > 1.8, then AF = 1.8

The formula above can modeled into a spreadsheet to automatically perform the Area Factor calculations. When using (or modeling) this formula, be aware that the code does not allow the resulting values to be less than 1.0 or more than 1.8. Notice also that Table 63.49 notes a, d and e limit the use of the Area Factor.

(2) For rooms serving multiple functions such as hotel banquet or meeting rooms and office conference or presentation rooms; an adjustment factor of 1.5 times the UPD may be used if a supplementary system is actually installed and meets the following conditions:

(a) The installed power for the supplementary system shall not be greater than 33 percent of the adjusted lighting power budget calculated for that space, and

(b) Independent controls shall be installed for the supplementary system.

(3) In rooms containing multiple simultaneous activities, such as a large general office having separate accounting and drafting areas within the same room, the lighting power budget for the rooms shall be the weighted average of the activities in proportion to the areas being served.

(4) The activity of indoor sports areas shall be considered as an area 10 feet beyond the playing boundaries of the sport, not to exceed the total floor area of the indoor sports space less the spectator seating area.

(5) The interior lighting power allowance shall be calculated in accordance with the equation given below. The interior lighting power allowance shall include a 0.20 W/ft^2 allowance for unlisted spaces.

$$ILPA = (LPB_1 + LPB_2 + ... + LPB_n) + (0.20\ W/ft^2 \times \text{unlisted space area})$$

Where:

ILPA = interior lighting power allowance, W

Unlisted space area = GLA - Σ(LS), ft^2

GLA = gross lighted area, ft^2

LPB = lighting power budget, W

LS = listed space

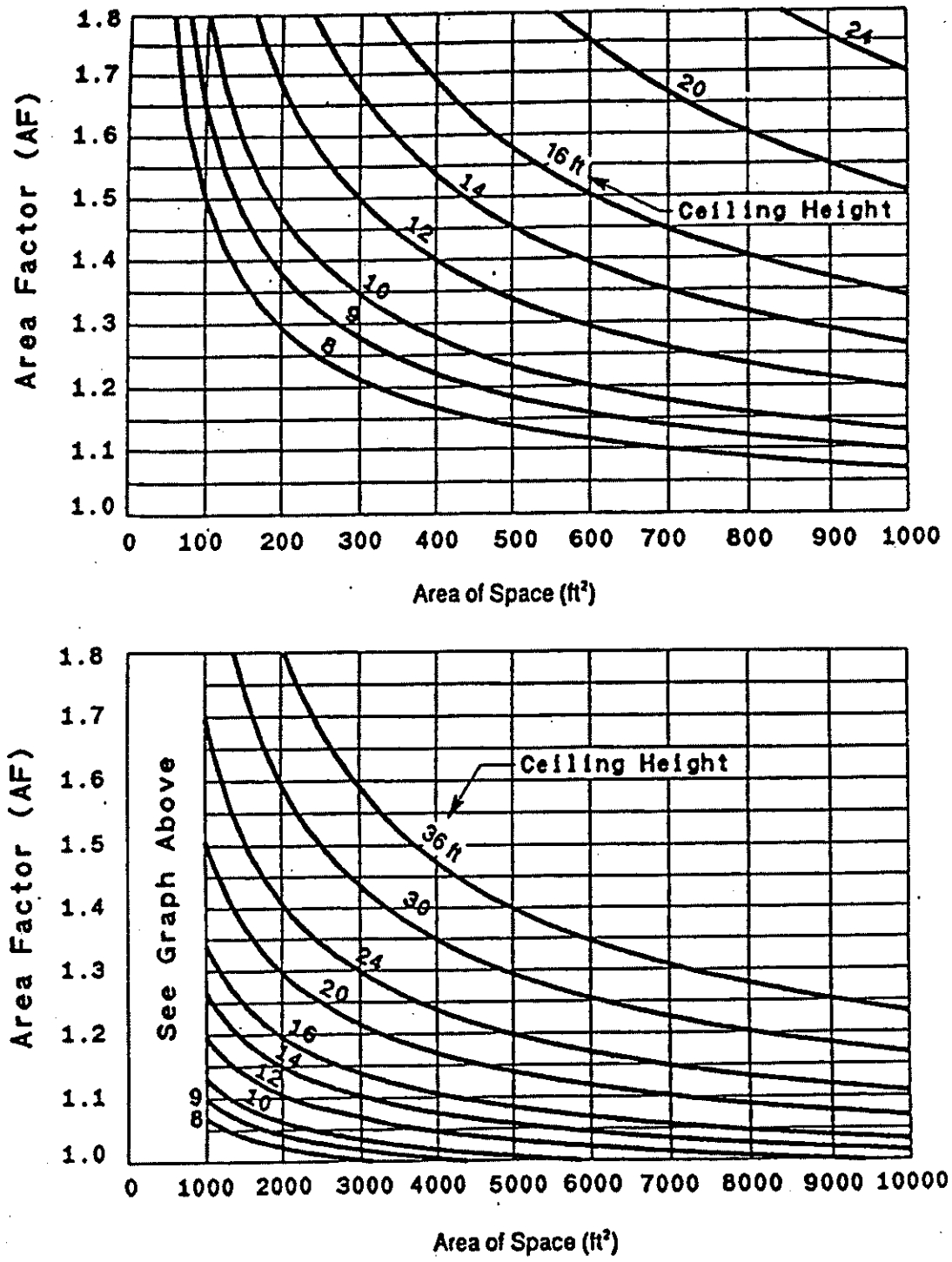


Figure 63.49 Area Factor

Table 63.49
Unit Power Densities
Part a - Common Activity Areas

Activity/Area	UPD W/ft^2	Note
Auditorium	1.6	a
Corridor	0.8	b
Classroom/Lecture Hall	2.0	
Electrical/Mechanical Equipment Room		
General	0.7	b
Control Rooms	1.5	b
Food Service		
Fast Food/Cafeteria	1.3	
Leisure Dining	2.5	c
Bar Lounge	2.5	c
Kitchen	1.4	
Recreation/Lounge	0.7	
Stair		
Active Traffic	0.6	
Emergency Exit	0.4	
Toilet and Washroom	0.8	
Garage		
Auto and Pedestrian Circulation Area	0.3	
Parking Area	0.2	
Laboratory	3.0	
Library		
Audio/Visual	1.1	
Stack Area	1.5	
Card File and Cataloging	1.6	
Reading Area	1.9	
Lobby (General)		
Reception and Waiting	1.0	
Elevator Lobbies	0.8	
Atrium (Multistory)		
First Three Floors	0.7	
Each Additional Floor	0.2	

Table 63.49
Unit Power Densities
Part a - Common Activity Areas (Continued)

Activity/Area	UPD W/ft^2	Note
Locker Room and Shower	0.8	
Office Category 1		
Enclosed offices, all open plan offices without partitions or with partitions* lower than 4.5 feet below the ceiling		
Reading, Typing and Filing	1.8	d
Drafting	2.6	d
Accounting	2.1	d
Office Category 2		
Open plan offices 900 square feet or larger with partitions* 3.5 to 4.5 feet below the ceiling Offices less than 900 square feet shall use Category 1		
Reading, Typing and Filing	1.9	b
Drafting	2.9	b
Accounting	2.4	b
Office Category 3		
Open plan offices 900 square feet or larger with partitions* higher than 3.5 feet below the ceiling Offices less than 900 square feet shall use Category 1		
Reading, Typing and Filing	2.2	b
Drafting	3.4	b
Accounting	2.7	b
Common Activity Areas		
Conference Meeting Room	1.8	a
Computer Office Equipment	2.1	
Filing, Inactive	1.0	
Mail Room	1.8	
Shop (Nonindustrial)		
Machinery	2.5	
Electrical/Electronic	2.5	
Painting	1.6	
Carpentry	2.3	
Welding	1.2	

Table 63.49
Unit Power Densities
Part a - Common Activity Areas (Continued)

Activity/Area	UPD W/ft^2	Note
Storage and Warehouse		
Inactive Storage	0.3	
Active Storage, Bulky	0.3	
Active Storage, Fine	1.0	
Material Handling	1.0	
Unlisted Space	0.2	

* Not less than 90 percent of all work stations shall be individually enclosed with partitions of at least the height described.

Part b - Specific Buildings

Activity/Area	UPD W/ft2	Note
Airport, Bus and Rail Station		
Baggage Area	1.0	
Concourse/Main Thruway	0.9	
Ticket Counter.	2.5	
Waiting and Lounge Area	1.2	
Bank		
Customer Area	1.1	
Banking Activity Area	2.8	
Barber and Beauty Parlor	2.0	
Church, Synagogue, Chapel		
Worship/Congregational	2.5	
Preaching and Sermon/	2.7	
Dormitory		
Bedroom	1.1	
Bedroom With Study	1.4	
Study Hall	1.8	
Fire and Police Department		
Fire Engine Room	0.7	
Detention Dayroom	1.5	
Jail Cell	1.2	

Table 63.49
Unit Power Densities
Part b - Specific Buildings (Continued)

Activity/Area	UPD W/ft^2	Note
Hospital/Nursing Home		
Corridor.	1.3	b
Dental Suite/Examination/Treatment	1.6	
Emergency	2.3	
Laboratory	3.0	
Lounge/Waiting Room	0.9	
Medical Supplies	2.4	
Nursery	2.0	
Nurse Station.	2.1	
Occupational Therapy/Physical Therapy	1.6	
Patient Room.	1.4	
Pharmacy.	1.7	
Radiology	2.1	
Surgical and O.B. Suites		
General Area	2.1	
Operating Room	7.0	
Recovery	2.3	
Hotel/Conference Center		
Banquet Room/Multipurpose	2.4	a
Bathroom/Powder Room	1.2	
Guest Room.	1.4	
Public Area.	1.2	
Exhibition Hall	2.6	
Conference/Meeting	1.8	a
Lobby	1.9	
Reception Desk	2.4	
Laundry		
Washing	0.9	
Ironing and Sorting	1.3	
Museum and Gallery		
General Exhibition	1.9	
Inspection/Restoration	3.9	
Storage (Artifacts)		
Inactive.	0.6	
Active	0.7	
Post Office		
Lobby	1.1	
Sorting and Mailing	2.1	

Table 63.49
Unit Power Densities
Part b - Specific Buildings (Continued)

Activity/Area	UPD W/ft^2	Note
Service Station/Auto Repair	1.0	
Theater		
Performance Arts	1.5	
Motion Picture	1.0	
Lobby.	1.5	
Retail Establishments		
Merchandising and Circulation Area - Applicable to all lighting, including accent and display lighting, installed in merchandising and circulation areas	2.2	
Mall Concourse	1.4	
Retail Support Areas		
Tailoring	2.1	
Dressing/Fitting Rooms	1.4	

Part c - Indoor Athletic Areas[e,f]

Activity/Area	UPD W/ft2
Seating Area, All Sports	0.4
Badminton	
Club	0.5
Tournament.	0.8
Basketball/Volleyball	
Intramural	0.8
College	1.3
Professional	1.9
Bowling	
Approach Area	0.5
Lanes.	1.1

Table 63.49
Unit Power Densities
Part c - Indoor Athletic Areas[e,f] (Continued)

Activity/Area	UPD W/ft2
Boxing or Wrestling (platform)	
Amateur.	2.4
Professional	4.8
Gymnasium	
General Exercising and Recreation Only	1.0
Handball/Raquetball/Squash	
Club	1.3
Tournament	2.6
Hockey, Ice	
Amateur	1.3
College or Professional	2.6
Skating Rink	
Recreational	0.9
Exhibition/Professional	2.6
Swimming	
Recreational	0.9
Exhibition	1.5
Under Water	1.0
Tennis	
Recreational (Class III)	1.3
Club/College (Class II	1.9
Professional (Class I)	2.6
Tennis, Table	
Club	1.0
Tournament	1.6

Notes for Table 63.49

a. A 1.5 power adjustment factor is applicable for multifunctional spaces.

b. Area factor of 1.0 shall be used for these spaces.

c. UPD includes lighting power required for clean-up purpose.

d. Area factor shall not exceed 1.55.

e. Area factor of 1.0 shall be used for all indoor athletic spaces.

f. Facilities that are used for more than one level of play shall have appropriate switching between the different levels specified in Table 63.49. Dimming shall not be used to accomplish the reduction in illumination. The illumination at all levels shall be uniform.

For the purposes of this code, canopies over fuel-dispensing areas are calculated as interior lighting at 4W/ft^2 under COMM 63.49.

Canopied areas where financial transactions take place, i.e. bank drive-up window or drive-up pharmacy, are considered interior lighting and may use the appropriate categories for financial transactions listed in Table 63.49.

At present, canopied areas that provide transition or shelter, i.e. covered walkways, airport walkways are considered canopied areas under the exterior lighting portion of this code. See Table 63.43 for power allowances.

COMM 63.50 LIGHTING CONTROLS THAT MUST BE INSTALLED.

(1) AREA CONTROLS.

(a) Except as provided in pars. (c) and (d), each interior area enclosed by ceiling-height partitions shall have an independent switching or control device. This switching or control device shall be:

1. Readily accessible; and

2. Located so that a person using the device can see the lights or area controlled by that switch, or so that the area being lit is annunciated; and

3. Manually operated, or automatically controlled by an occupant-sensing device that meets the requirements of s. COMM 63.51 (4).

(b) Other devices may be installed in conjunction with the switching or control device required by par. (a) provided that they:

1. Permit the required switching or control device to override the action of the other devices; and

2. Reset the mode of any automatic system to normal operation without further action.

(c) Up to one-half watt per square foot of lighting in any area within a building that must be continuously illuminated for reasons of building security or emergency egress are exempt from par. (a) if:

1. The area is designated a security or emergency egress area on the plans and specifications submitted to the department; and

2. The area is controlled by switches accessible only to authorized personnel.

(d) Public areas with switches that are accessible only to authorized personnel are exempt from the area control requirements of par. (a).

(2) CONTROLS TO REDUCE LIGHTING.

(a) Except as provided in par. (b), the general lighting of any enclosed interior space 100 square feet or larger in which the connected lighting load exceeds 1.2 watts per square foot for the space as a whole, and that has more than one light source or luminaire, shall be controlled so that the load for the lights may be reduced by at least one-half while maintaining a reasonably uniform level of illuminance throughout the area. A reasonably uniform reduction of illuminance shall be achieved by one of the following or other method approved by the department:

1. Controlling all lamps or luminaires with dimmers; or

2. Dual switching of alternate rows of luminaires, alternate luminaires, or alternate lamps; or

3. Switching the middle lamps of three lamp luminaires independently of the outer lamps; or

4. Switching each luminaire or each lamp.

(b) The requirements of par. (a) do not apply to:

1. Lights in areas that are controlled by an occupant-sensing device that meets the requirements of s. COMM 63.51 (4);

2. Lights in corridors; or

3. Lights in areas that are controlled by an automatic time switch control device that has a timed manual override available at each switch location required by sub. (1), and that controls only the lights in that area enclosed by ceiling height partitions.

(3) DAYLIT AREAS.

(a) Except as provided in (b), daylit areas in any interior enclosed space greater than 250 square feet shall meet the requirements of 1. and 2.

1. Such areas shall have at least one control that:

a. Controls only luminaires in the daylit area; and

b. Controls at least 50% of the lamps or luminaires in the daylit area, in a manner described in sub. (2)(a) 1. to 4., independently of all other lamps or luminaires in the enclosed space. The other luminaires in the enclosed space may be controlled in any manner allowed by sub. (2)(a) 1. to 4.

2. Such areas shall have controls that control the luminaires in each vertically daylit area separately from the luminaires in each horizontally daylit area.

(b) The requirements of this subsection do not apply to:

1. Daylit areas where the effective aperture of glazing is equal or less than 0.1 for vertical glazing and 0.01 for horizontal glazing; or

2. Daylit areas where existing adjacent structures or natural objects obstruct daylight to the extent that effective use of daylighting is not feasible.

The Effective Aperture (EA) is calculated for each room with daylit area(s). The window-wall ratio used in calculating EA is determined from the gross exterior wall area of that wall of the room having the window(s) and from the window area of that wall. Likewise, the skylight-to-roof area ratio is determined from the skylight area and the gross exterior roof area of the room containing the skylight(s). See Effective Aperture definition in COMM 63.05(16) and Well Efficiency in 63.05(77)

(4) SHUT-OFF CONTROLS.

(a) Except as provided in (b), for every floor or metered space, all interior lighting systems shall be equipped with at least one separate automatic control to shut off the lighting. This automatic control shall meet the requirements of s. COMM 63.51 and may be an occupancy sensor, automatic time switch, or other device capable of automatically shutting off the lighting.

The shut-off control requirements may be met by using multiple control devices. For instance, if occupancy sensors are used in several rooms of a building, the areas controlled by occupancy sensors may be subtracted from the area controlled by an automatic time switch.

(b) The requirements of par. (a) do not apply to the following:

1. Buildings or separately metered spaces of less than 5,000 square feet of conditioned space;

2. Where the system is serving an area that must be continuously lit, or where the use of the space prohibits the use of a preestablished lighting program;

Examples of a continuously-lit lighting system would be a hospital room, a police station or a grocery store that is open 24 hours/day, 7 days/week.

3. Lighting in corridors, guest rooms, and lodging quarters of residential buildings hotels and motels;

*Lighting in corridors of buildings other than residential buildings, hotels and motels is **not** exempt from shut-off controls requirements.*

4. Up to one-half watt per square foot of lighting in any area within a building that must be continuously illuminated for reasons of building security or emergency egress, if:

a. The area is designated a security or emergency egress area on the plans and specifications submitted to the department; or

b. The area is controlled by switches accessible only to authorized personnel.

(c) If an automatic time switch control device is installed to comply with par. (a), it shall incorporate an override switching device that:

1. Is readily accessible; and

2. Is located so that a person using the device can see the lights or the area controlled by that switch, or so that the area being lit is annunciated; and

3. Is manually operated; and

4. Allows the lighting to remain on for no more than two hours when an override is initiated; and

5. Controls an area not exceeding 5,000 square feet.

6. Two overrides may be provided for a maximum of 10,000 square feet if the lighting is dual level controlled in accordance with subd. (2)(a) 2. or 3.

(5) DISPLAY LIGHTING CONTROLS. Display lighting shall be separately switched on circuits that are 20 amps or less.

(6) EXTERIOR LIGHTING CONTROLS. Except in lighting in parking garages, tunnels, and large covered areas that require illumination during daylight hours, exterior lighting shall be controlled by a directional photocell or astronomical time switch that automatically turns off the exterior lighting when daylight is available. Time switches shall be equipped with back-up provisions to keep time during a power outage of 10 hours or more.

(7) HOTEL AND MOTEL GUEST ROOM CONTROLS. Hotel and motel guest rooms or suites excluding bathrooms shall have one or more master switches at the main entry door or at

the entry door of each room that turn off all permanently wired lighting fixtures and switched receptacles in the room or suite.

COMM 63.51 REQUIREMENTS FOR LIGHTING CONTROL DEVICES.

Automatic time switch control devices, occupant-sensing devices, automatic daylighting control devices, lumen maintenance control devices, or interior photocell sensor devices that are used to justify a wattage reduction factor in the calculation of the actual internal lighting power in s. COMM 63.45 (2) shall be approved for compliance with all of the applicable requirements of subs. (1) to (7) and shall be installed in compliance with sub. (8). Approval of devices shall be obtained via the material approval program in accordance with s. COMM 50.19 or via manufacturer certification to the California Energy Commission.

A database directory of certified devices may be obtained through the California Energy Commission's Bulletin Board System. The system may be accessed and files downloaded by using a communications program and computer modem. Call the BBS through the computer's communications program (916) 654-4069, and follow the instructions.

The database contains a listing of certified occupancy sensors, daylighting control devices, lumen-maintenance control devices and automatic daylighting control devices.

Note: Information on California Energy Commission Certification may be obtained from the California Energy Commission, Energy Efficiency and Local Assistance Division, 1516 9th Street, MS-2S, Sacramento, CA 95814-5512.

(1) ALL DEVICES: INSTRUCTIONS FOR INSTALLATION AND CALIBRATION. The manufacturer shall provide step-by-step instructions for installation and start-up calibration of the device.

(2) ALL DEVICES: STATUS SIGNAL. The device shall have an indicator that visibly or audibly informs the device operator that it is operating properly, or that it has failed or malfunctioned, except for photocell sensors or other devices where a status signal is infeasible because of inadequate power.

(3) AUTOMATIC TIME SWITCH CONTROL DEVICES. Automatic time switch control devices shall:

(a) Be capable of programming different schedules for weekdays and weekends; and

(b) Incorporate an automatic "holiday shut-off" feature that turns off all loads for at least 24 hours, then resumes the normally scheduled operation; and

(c) Have program backup capabilities that prevent the loss of the device's program and time setting for at least 10 hours if power is interrupted.

(4) OCCUPANT-SENSING DEVICES. Occupant-sensing devices shall be capable of automatically controlling all the lights in an area no more than 30 minutes after the area has been vacated. In addition, ultrasonic and microwave devices shall have a built-in mechanism that allows calibration of the sensitivity of the device to room movement in order to reduce the false sensing of occupants and shall comply with either par. (a) or (b), as applicable:

(a) If the device emits ultrasonic radiation as a signal for sensing occupants within an area, the device shall:

1. Have had an Initial Report submitted to the Bureau of Radiological Health, Federal Food and Drug Administration, under 21 Code of Federal Regulations, Section 1002.10; and

2. Emit no audible sound; and

3. Not emit ultrasound in excess of the decibel (dB) values given in Table 63.61 measured no more than 5 feet from the source on axis.

Table 63.51
Maximum Ultrasound Emissions

Midfrequency of Sound Pressure Third-Octave Bank (in kHz)	Maximum dB Level within Third-Octave Band (in dB reference 20 micropascals)
less than 20	80
20 or more to less than 25	105
25 or more to less than 31.5	110
31.5 or more	115

(b) If the device emits microwave radiation as a signal for sensing occupants within area, the device shall:

1. Comply with all applicable provisions in 47 Code of Federal Regulations, Part 5, and have an approved Federal Communications Commission identification number that appears on all units of the device and that has been submitted to the department; and

2. Not emit radiation in excess of 1 milliwatt per square centimeter measured at no more than 5 centimeters from the emission surface of the device; and

3. Have permanently affixed to it installation instructions recommending that it be installed at least 12 inches from any area normally used by room occupants.

(5) AUTOMATIC DAYLIGHTING CONTROL DEVICES. Automatic daylighting control devices shall:

(a) Be capable of reducing the light output of the general lighting of the controlled area by at least one-half while maintaining a uniform level of illuminance throughout the area; and

(b) If the device is a dimmer, provide electrical outputs to lamps for reduced flicker operation through the dimming range and without causing premature lamp failure; and

(c) If the device is a stepped dimming system, incorporate time delay circuits to prevent cycling of light level changes of less than three minutes; and

(d) If the device uses step switching with separate "on" and "off" settings for the steps, have sufficient separation or deadband of "on" or "off" points to prevent cycling; and

(e) Have provided by the manufacturer step-by-step instructions for installation and start-up calibration to design foot-candle levels.

(6) LUMEN MAINTENANCE CONTROL DEVICES. Lumen maintenance control devices shall:

(a) Be capable of reducing the light output of the general lighting of the controlled area by at least 30 percent while maintaining a uniform illuminance throughout the area; and

(b) Provide electrical outputs to lamps for reduced flicker operation through the dimming range and without causing premature lamp failure; and

(c) Incorporate an alarm, either audible or visible, to announce when a specified setpoint of lumens or watts has been reached; and

(d) Have provided by the manufacturer step-by-step instructions for installation and start up calibration to design foot-candle levels.

(7) INTERIOR PHOTOCELL SENSOR DEVICES. Interior photocell sensors shall not have a mechanical slide cover or other device that permits easy unauthorized disabling of the control, and shall not be incorporated into a wall-mounted occupant-sensing device.

(8) INSTALLATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. If an automatic time switch control device, occupant-sensing device, automatic daylighting control device, lumen maintenance control device, or interior photocell sensor device is installed, it shall comply with both pars. (a) and (b).

(a) The device shall be installed in accordance with the manufacturer's instructions; and

(b) Automatic daylighting control devices and lumen maintenance control devices shall:

1. Be installed so that automatic daylighting control devices control only luminaries within the daylit area; and

2. Have photocell sensors that are either ceiling mounted or located so that they are accessible only to authorized personnel, and that are located so that they maintain adequate illumination in the area according to the designer's or manufacturer's instructions.

COMM 63.52 EXIT SIGNS.

Exit signs shall have an installed wattage of 20 watts or less.

COMM 63.53 REDUCTION OF SINGLE LAMP BALLASTS.

The following luminaries located within the same room shall be tandem wired or provided with three-lamp ballasts:

(1) One-lamp or three-lamp fluorescent luminaries recess-mounted within 10 feet center-to-center of each other; and

(2) One-lamp or three-lamp fluorescent luminaries pendant- or surface-mounted within one foot edge-to-edge of each other.

Subchapter VI — Nondepletable Energy Source

COMM 63.60 BUILDINGS UTILIZING SOLAR, GEOTHERMAL, WIND OR OTHER NONDEPLETABLE ENERGY SOURCE.

Any building, or portion thereof, utilizing any nondepletable energy source shall meet all the requirements of this chapter. An energy credit will be given to the building envelope in the amount of the net nondepletable energy collected. The nondepletable energy must be derived from a specific collection, storage and distribution system, which may include active and passive systems.

Note: An energy credit to the building envelope in the amount of the net recovered energy will be given to the use of recovery systems which will conserve energy, provided the amount expended is less than the amount recovered when the energy transfer potential and the operating hours are considered.

COMM 63.61 DOCUMENTATION.

Proposed alternative designs, submitted as variations to the standard design criteria, shall be accompanied by an energy analysis. This department will accept alternative systems designed according to the requirements of nationally recognized agencies.

Subchapter VII — System Analysis Design

COMM 63.70 ANNUAL ENERGY CONSUMPTION.

A building designed in accordance with this part will be deemed as complying with this chapter if the calculated annual energy consumption is not greater than a similar building with enclosure elements and energy consuming systems designed in accordance with subchapters I through V. If the proposed alternative design results in an increase in consumption of one energy source and a decrease in another energy source, the difference in each energy source shall be converted to equivalent energy units for purposes of comparing the total energy used.

Note: Use of the ASHRAE 90.1 Energy Cost Budget Method will not verify compliance with all portions of subchapters I through V. Compliance with the following sections of ch. COMM 63 must be shown independently if the Energy Cost Budget Method is used: ss. COMM 63.11 to 12, 63.20 to 63.29, 63.32 (2) and subchapter V.

COMM 63.71 SIMULATION.

The calculation procedure used to simulate the operation of the building and its service systems through a full year operating period shall be detailed to permit the evaluation of the effect of system design, climatic factors, operational characteristics, and mechanical equipment on annual energy usage. Manufacturer's data or comparable field test data shall be used when available in the simulation of all systems and equipment. The calculation procedure shall be based upon 8,760 hours of operation of the building and its service systems and shall utilize the following input:

(1) CLIMATIC DATA: Coincident hourly data for temperatures, solar radiation, wind and humidity of typical days in the year representing seasonal variation.

(2) BUILDING DATA: Orientation, size, shape, thermal mass, air moisture and heat transfer characteristics.

(3) OPERATIONAL CHARACTERISTICS: Temperature, humidity, ventilation, illumination, control mode for occupied and unoccupied hours.

(4) MECHANICAL EQUIPMENT: Design capacity, partial load profile.

(5) BUILDING LOADS: Internal heat generation, lighting, equipment, number of people during occupied and unoccupied periods.

COMM 63.72 DOCUMENTATION.

Proposed alternative designs, submitted as requests for exception to the standard design criteria, shall be accompanied by an energy analysis comparison report. The report shall provide technical detail on the building and system design and on the data used.

Chapter 63
Energy Conservation
Appendix

Wisconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

All constructions or installations under s. Comm 50.07 (2) and (3) shall be supervised by a Wisconsin registered architect or engineer, except that a Wisconsin registered HVAC designer may supervise the installation of heating, ventilating and air conditioning systems, and a registered electrical designer may supervise the installation of illumination systems. The plans, specifications, and calculations require the signature and seal or stamp of the appropriate professional listed above. Comm 50.08.

Registration Stamp & Signature

ENERGY EFFICIENCY PLAN CHECK WORKSHEETS

Check below if included with submittal

I. ENERGY/HVAC FORM INDEX

I-1: Index ✓

II. BUILDING ENVELOPE PLAN CHECK WORKSHEETS

E-1: Building Envelope Summary _____
E-2: Fenestration Worksheet _____
E-3: Opaque Surfaces Worksheet _____
E-4: Skylight Exemption Worksheet _____
E-5: Opaque Trade-Off Worksheet _____

III. LIGHTING PLAN CHECK WORKSHEETS

L-1: Lighting Summary _____
L-2: Exterior Lighting Power Worksheet _____
L-3: Installed Interior Lighting Power Worksheet _____
L-4: Complete Building/Area Category Methods Worksheet _____
L-5: Activity Method Worksheet _____

IV. HVAC PLAN CHECK WORKSHEETS

H-1: HVAC Summary _____
H-2: HVAC Prescriptive Worksheet _____
H-3: HVAC Equipment Summary _____

The information you provide may be used by other agency programs [Privacy Law, s. 15.04 (1)(m)].

SBD-10512 (R.10/98)

II. BUILDING ENVELOPE PLAN CHECK DOCUMENTS

This section describes the forms and procedures for documenting compliance with the building envelope energy efficiency requirements of the code. It does not describe the details of the requirements; these are presented in the code. Determination of code compliance will be based on the actual code section. The following discussion is addressed to the designer preparing construction documents and compliance statements and to the plan reviewers who are examining those documents for compliance with the code.

The use of each form is briefly described below. The complete instructions for each form are presented in the following subsections.

E-1: Building Envelope Summary.

This information is required for every project involving the building envelope.

E-2: Fenestration Worksheet.

Used only for the Component Standards and System Standards methods. This worksheet produces area-weighted average values for the Fenestration U-Value and Shading Coefficient (SC_x). For the System Standards method of s. Comm 63.16, one of these worksheets should be completed for each orientation. (It is not necessary to fill this out if there is only one Fenestration U-Value and Shading Coefficient for the entire project.)

E-3: Opaque Surfaces Worksheet.

This worksheet is used only for the Component Standards method and System Standards method. This worksheet produces the area-weighted average values for the U-values of roof, walls (including opaque doors), and floor assemblies. For the System Standards method, one of these worksheets should be completed for each orientation.

E-4: Skylight Exemption Worksheet.

This information will only be required when skylights are to be exempt from the roof area thermal performance calculation.

E-5: Opaque Trade-Off Worksheet.

This information will only be required when opaque trade-offs are used per the requirements of Comm 63.15 (3) & (4).

SBD-10373 (R.10/98)

BUILDING ENVELOPE SUMMARY E-1

This worksheet is applicable to all projects involving the building envelope.

Project Information

This information asks for the project name and address and those people responsible for the building design and compliance forms.

Compliance Approach

Check one of the three boxes:

Component Standards: If this box is checked, provide the number of the region in which the building is located from Figure 63.15-2 of the code and the Alternate Component Package (ACP) Table letter.

System Standards: If this box is checked, provide the computer printout or other documentation of envelope compliance and E-1 form, or appropriate thermal performance calculations for factories and warehouses as listed in Comm 63.14 (2)(3).

System Analysis Design: If the project is demonstrating compliance through the System Analysis Design method, check this box. A complete analysis must be provided.

Basic Requirements

Fill the boxes in this column with either a check mark or "X" to indicate a positive response or "N/A" to indicate a negative response. If the skylight exemption is marked (see "Special Considerations"), attach the Skylight Exemption Worksheet (E-4).

Prescriptive/Performance Requirements

If the project is demonstrating compliance through the Component Standards method, all of these items must be completed. The area-weighted properties such as components U-values and fenestration SC_x are obtained from the Fenestration Worksheet (E-2) and Opaque Surfaces Worksheet (E-3). The items under "Requirements" are obtained from the ACP Table.

If the System Standards method is used (e.g., ASHRAE's ENVSTD Program), only the items in the "Design" column need to be completed. Where there is more than one of a particular assembly, enter all of the values.

If the Opaque Trade-Off is used, provide the design information and demonstrate that the Total Design U•Area is equal to or less than the Total Required U•Area.

If the System Analysis Design method (e.g., ASHRAE's Energy Cost Budget method) is used, the items in the design column should be filled in, where applicable, to speed the plan review.

Additional Data

This column serves as a reference for additional building envelope forms and calculations. If Worksheets E-2 through E-5 are submitted, it should be indicated on Form I-1. Boxes are provided for other submittal data. An additional blank is provided to indicate attached calculations such as calculation of mass wall heat capacity or interpolations of tables.

FENESTRATION WORKSHEET E-2

This worksheet is applicable to projects that demonstrate compliance through the Component Standards method or the System Standards method. It is not applicable to projects that demonstrate compliance through the System Analysis Design method.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the Building Envelope Summary (E-1) form.

Area-Weighted Properties

Assembly ID: Insert a descriptor of the particular assembly. A separate ID must be supplied for each group of assemblies that have unique U-values or shading coefficients.

Area: Enter the Total Area (in ft^2) for that fenestration assembly (glazing and frame) on a project-wide basis. For the System Standards method, this would be the area for that assembly on an orientation basis. The values from all entries in this column should be summed into the box marked "Total Area" at the bottom of the column.

U-Value (or shading coefficient, SC_x): Enter the appropriate property for each fenestration assembly (glazing and frame).

U (or SC_x) •Area: This column is the product of the assembly area (second column) by the fenestration U-value (or SC_x from the third column). The values from all entries in this column should be summed into the box marked "Total U•Area" at the bottom of the column.

The area-weighted U-value (or SC_x) is calculated by dividing the value in "Total U•Area" by the value in "Total Area."

OPAQUE SURFACES WORKSHEET E-3

This worksheet is applicable to projects that demonstrate compliance through either the Component Standards method or System Standards method. It is not applicable to projects that demonstrate compliance through the System Analysis Design method.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the Building Envelope Summary (E-1) form.

Assembly ID: Insert a descriptor of the particular assembly. This may be a descriptor or number from the appropriate schedule in the plans. A separate item must be supplied for each group of assemblies that have unique U-values.

Area: Enter the Total area (in ft^2) for that assembly (roof, wall, or floor) on a project-wide basis. For the System Standards method, this would be the area for that assembly on an orientation basis. The values from all entries in this column should be summed into the box marked "Total Area" at the bottom of the column.

U-Value: Enter the appropriate property for each assembly. Overall thermal transmittance of assemblies must be calculated in accordance with s. Comm 63.18. The calculation procedure must consider the effect of framing.

If skylights are installed, they must be included in the overall U-value calculation of the roof unless an exemption is obtained under s. Comm 63.12. A skylight exemption worksheet (E-4) must be included.

U•Area: This column is the product of the assembly area (second column) by the assembly U-value. The values from all entries in this column should be summed into the box marked "Total U•Area" by the value in "Total Area."

The area-weighted U-value is calculated by dividing the value in "Total U•Area" by the value in "Total Area."

SKYLIGHT EXEMPTION WORKSHEET E-4

This worksheet is applicable when skylights are exempt from the roof area overall U-value calculation per the requirements of Comm 63.12. It may be used with any method of compliance.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the Building Envelope Summary (E-1) form.

Skylight Exemption Worksheet

All of the boxes except the item marked "Special Consideration" (50% shading device credit) must be filled in with a check or "X" to indicate affirmation. The 50% shading device credit box must be filled in with either a check, "X," or "N/A."

All of the "Design" and "Requirement" information must be completed. The skylight-to-roof ratio requirement is the maximum percent of skylight area taken from ASHRAE 90.1, Tables 8-3a and 8-3b of Table A63.12. The maximum area will depend on the visible light transmittance (VLT) and whether or not shading is provided for the skylight.

The lighting power density may be taken from the allowed lighting power density from s. Comm 63.47, 63.48, or 63.49, or the actual installed lighting power density adjusted for controls under s. Comm 63.45 (2) may be used.

The design lighting level, in foot-candles, is the judgment of the designer, but should be in general agreement with the reCommendations of the Illuminating Engineering Society. (Refer to the IES Lighting Handbook, application volume, 1987.) The designer should choose the lighting level in the table closest to the condition in the proposed building. Interpolation or extrapolation for lighting level is not permitted.

OPAQUE TRADE-OFF WORKSHEET E-5

This worksheet is applicable to projects that demonstrate compliance through Opaque Trade-Offs as used with the requirements of Comm 63.15 (3) & (4).

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the Building Envelope Summary (E-1) form.

Assembly ID: Insert a descriptor of the particular assembly. This may be a descriptor or number from the appropriate schedule in the plans. A separate item must be supplied for each group of assemblies that have unique U-values.

Area: Enter the Total area (in ft^2) for that assembly (roof, wall, or floor) on a project-wide basis. For the System Standards method, this would be the area for that assembly on an orientation basis. The values from all entries in this column should be summed into the box marked "Total Area" at the bottom of the column.

U-Value: Enter the appropriate property for each assembly. Overall thermal transmittance of assemblies must be calculated in accordance with s. Comm 63.18. The calculation procedure must consider the effect of framing.

If skylights are installed, they must be included in the overall U-value calculation of the roof unless an exemption is obtained under s. Comm 63.12. A skylight exemption worksheet (E-4) must be included.

U•Area: This column is the product of the assembly area (second column) by the assembly U-value.

Total Design U•Area: Add all U•Area values associated with the Design column. The U•Area values are to be derived from the designed roofs, walls adjacent to unconditioned spaces, above grade exterior walls, and floors over unconditioned spaces.

Total Required U•Area: Add all U•Area values associated with the Requirement column. The U•Area values are to be derived from code required roofs, walls adjacent to unconditioned spaces, above grade exterior walls, and floors over unconditioned spaces

Compliance is shown when the "Total Design U•Area" is less than or equal to the "Total Required U•Area."

BUILDING ENVELOPE SUMMARY

E-1

Wisconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

Compliance Approach Region_____ Component Standards (See Comm 63.15) ACP Table _____ System Standards (See Comm 63.16) (See Fig. 63.15-2) System Analysis Design (See Comm 63.70-72)

Fenestration

Basic Requirements

- ☐ U-values reported on this form are area-weighted averages. Comm 63.18 (1)
- ☐ Windows and doors meet the air infiltration requirements. Comm 63.11
- ☐ Fenestration U-values are certified by NFRC or from Table 63.18-3. Comm 63.18 (2)(b)
- ☐ Fenestration shading coefficients are obtained from either the 1989 ASHRAE Handbook of Fundamentals or manufacturer's data. Comm 63.18 (4)
- ☐ Exterior joints, cracks, and holes in the building envelope are caulked, gasketed, weather stripped, or otherwise sealed. Comm 63.11
- ☐ Double entry vestibule? (Optional--check if provided)
- ☐ Windows with reflective glazing? (Optional----check if provided)

Prescriptive/Performance Requirements

Fenestration Properties	**Design**	**Requirement If using Component Standards, see ACP Table Fig. 63.15-2**
Window Area (WA) Comm 63.05 (79)	_____	
Gross Wall Area (GWA) Comm 63.05 (27) Comm 63.18 (2)(b) & (3)	_____	
Window-Wall Ratio (WA/GWA) Comm 63.05 (80)	_____	≤_____
Window U-value Comm 63.18 (2)(b)	_____	
Window SCx Comm 63.18 (4)	_____	
Skylights Installed	___ Yes	___ No

Additional Data

- Fenestration Worksheet (E-2)
- Opaque Surfaces Worksheet (E-3)
- Skylight Exemption Worksheet (E-4)
- Opaque Trade-off Worksheet (E-5)
- ☐ Marked Up ACP Table Included

Exterior Opaque Surfaces

Basic Requirements

- ☐ U-values reported on this form are area-weighted averages. Comm 63.18 (1)
- ☐ An approved method which accounts for the thermal bridging of framing is used to calculate U-values for envelope assemblies. Comm 63.18 (2)
- ☐ Exterior joints, cracks, and holes in the building envelope are caulked, gasketed, weather stripped, or otherwise sealed. Comm 63.11
- ☐ Vapor barriers are installed to prevent deterioration of insulation performance. Comm 63.11 (4)
- ☐ **Special Consideration** The skylight exemption is applied. Comm 63.12

  (Attach Skylight Exemption Worksheet E-4)

Prescriptive/Performance Requirements

Wall Design		
U-value Comm 63.18 (2)(a)	_____	
Heat Capacity (HC) Comm 63.05 (34) Appendix A63.15 (3)(b)	_____	
Insulation position (interior or exterior) Comm 63.05 (44)	_____	
U-Values		
Roof Comm 63.18 (2)(a)	_____	≤_____
Walls adjacent to unconditioned space Comm 63.18 (2)(a)	_____	≤_____
Floors over unconditioned space Comm 63.18 (2)(a)	_____	≤_____

Additional Data

- ☐ COMcheck-EZ Report Included
- ☐ ENVSTD Output Included
- ☐ _____

Below Grade

Basic Requirements

- ☐ R-values reported on this form for slab-on-grade floors and walls below grade include only the insulating material. Comm 63.15 (5) and (6)
- ☐ Insulation continuity is maintained. Comm 63.15 (5)

Prescriptive/Performance Requirements

R-Values		
Walls below grade Comm 63.18 (2)(a)	_____	≥_____
Slab-on-grade Comm 63.18 (2)(a)	_____	≥_____

The information you provide may be used by other agency programs [Privacy Law, s. 15.04 (1)(m)].

SBD-10373 (R.10/98)

FENESTRATION WORKSHEET E-2

Wisconsin Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

Fenestration Orientation: _____
For System Standards Method

Area-Weighted Properties - Comm 63.18

Fenestration **U-Value** (U_{of}) see Comm 63.18 (2)(b)

Assembly ID	Area	U-Value	U•Area
	X		=
	X		=
	X		=
	X		=
	X		=
	X		=
	X		=
	X		=
Total Area→		Total U•Area→	

$$\frac{\text{Total U•Area}}{\text{Total Area}} = \boxed{}$$

Fenestration **Shading Coefficient** (SC_x) see Comm 63.18(4)

Assembly ID	Area	SC_x	SC_x•Area
	X		=
	x		=
	x		=
	x		=
	x		=
	x		=
	x		=
	x		=
Total Area→		Total SC_x•Area→	

$$\frac{\text{Total } SC_x\text{•Area}}{\text{Total Area}} = \boxed{}$$

OPAQUE SURFACES WORKSHEET

E-3

Wisconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

Exterior Wall Orientation: _____
For System Standards Method

Area-Weighted Properties - Comm 63.18

Roofs see Comm 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
	x		=
	x		=
	x		=
	x		=
Total Area→		Total U•Area→	

Total U•Area / Total Area

Walls Adjacent to Unconditioned Spaces see Comm 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
	x		=
	x		=
	x		=
	x		=
Total Area→		Total U•Area→	

Total U•Area / Total Area

Above Grade Exterior Walls see Comm 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
	x		=
	x		=
	x		=
	x		=
Total Area→		Total U•Area→	

Total U•Area / Total Area

Floors Over Unconditioned Spaces see Comm 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
	X		=
	x		=
	x		=
	x		=
Total Area→		Total U•Area→	

Total U•Area / Total Area

SKYLIGHT EXEMPTION WORKSHEET E-4

Wisconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

Skylight Exemption Requirements see Comm 63.12

- ☐ U-values of skylight curbs are less than 0.21 Btu/hr•ft²•°F.
- ☐ Overall thermal transmittance of skylight assemblies is less than 0.70 Btu/hr•ft²•°F.
- ☐ Air leakage is less than 0.5 cfm/ft² of skylight.
- ☐ Automatic daylighting controls installed to reduce electric lighting by 50%.
- **Special Consideration**
  ☐ Shading devices used to block 50% of the solar gain during peak cooling conditions.

Skylight Design Data	Design	Requirement
Skylight Area (SA)	_____	
Gross Roof Area (GRA)	_____	
Skylight-to-Roof Ratio (SA/GRA)	_____	≤ _____
Skylight U-value	_____	
Skylight VLT	_____	
Lighting Power Density (LPD/ft²)	_____	
Design lighting level (footcandles)	_____	

Additional Data

- ☐ ENVSTD output
- ☐ Calculation of allowed skylight percent.
- ☐ Sketch of shading devices.

OPAQUE ASSEMBLY TRADE-OFF WORKSHEET E-5

Visconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

DESIGN

Design - Roofs See Comm 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
	x	=	
	x	=	
	x	=	
	x	=	
Total Area→			

REQUIREMENT

Required - Roofs See Comm 63.15 (4)

Total Area	Required U-Value	U•Area
x		=

Design - Above Grade Exterior Walls

See Comm 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
	x	=	
	x	=	
	x	=	
	x	=	
Total Area→			

Required - Above Grade Exterior Walls

See Comm 63.15 (4)

Total Area	Required U-Value	U•Area
x		=

Design - Walls Adjacent to Unconditioned Space

See Comm 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
	x	=	
	x	=	
	x	=	
	x	=	
Total Area→			

Required - Walls Adjacent to Unconditioned Space See Comm 63.15 (4)

Total Area	Required U-Value	U•Area
x		=

Design - Floors Over Unconditioned Space

See Comm 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
	x	=	
	x	=	
	x	=	
Total Area→			

Required - Floors Over Unconditioned Space

See Comm 63.15 (4)

Total Area	Required U-Value	U•Area
x		=

Σ Total Design U•Area ____ ≤ **Σ Total Required U•Area** ____

The Total Design U•Area must be less than or equal to the Total Required U•Area

III. LIGHTING PLAN CHECK DOCUMENTS

This section describes the forms and procedures for documenting compliance with the lighting energy efficiency requirements of the code. It does not describe the details of the requirements; these are presented in the code. The following discussion is addressed to the designer preparing construction documents and compliance statements and to the plan reviewers who are examining those documents for compliance with the code.

The use of each form is briefly described below. The complete instructions for each form are presented in the following subsections.

L-1: Lighting Summary.

This information is required for every project involving lighting and lighting controls.

L-2: Exterior Lighting Power Worksheet.

This information is also required for every project involving lighting and lighting controls.

L-3: Installed Interior Lighting Power Worksheet.

This information is also required for every project involving lighting and lighting controls.

L-4: Complete Building/Area Category Methods Worksheet

This information will only be required when calculating the Interior Lighting Power Allowance using either the Complete Building Method or the Area Category Method.

L-5: Activity Method Worksheet.

This information will only be required when calculating the Interior Lighting Power Allowance using the activity method.

LIGHTING SUMMARY L-1

The Lighting Summary (L-1) form is in four parts. A copy of these forms must be submitted to the Division along with the rest of the compliance submittal at the time of building plan review.

A. Lighting Summary (L-1) Part 1

Project Information

Part 1 of the Lighting Summary form asks for the project name and address and those people responsible for the lighting design and compliance forms. The project name and address should be the same as on the Building Envelope forms for the project.

Method of Interior Lighting Compliance

Check one of the four boxes:

Complete Building: If this box is checked, the Complete Building/Area Category Methods Worksheet (L-4) must be provided.

Area Category: If this box is checked, the Complete Building/Area Category Methods Worksheet (L-4) must be provided.

Activity: If this box is checked, the Activity Method Worksheet (L-5) must be provided.

Other: If compliance for the project is demonstrated through the System Analysis Design method of ss. Comm 63.70-72 where all energy-using systems are considered together, check this box. A complete analysis must be provided.

Basic Requirements

All of the boxes in this column must be filled with either a check or "X" to indicate affirmation or "N/A" to indicate not applicable. For exterior lighting, enter the Exterior Lighting Power (ELP) and the Exterior Lighting Power Allowance (ELPA). These are obtained from the Exterior Lighting Power Worksheet (L-2).

Prescriptive/Performance Requirements

Enter the Installed Interior Lighting Power (ILP) and the Interior Lighting Power Allowance (ILPA). The ILP is obtained from the Interior Lighting Power Allowance Worksheet (L-3). The ILPA is obtained from the Complete Building/Area Category Methods Worksheet (L-4) if either the Complete Building Method or the Area Category Method is used. The ILPA is obtained from the Activity Method Worksheet (L-5) if the if the Activity Method is used. The lighting power control credits box is filled with a check or "X" when control credits are taken, otherwise enter "N/A."

Worksheets

Indicate which worksheets are attached.

B. Lighting Summary (L-1) Parts 2 to 4

Parts 2 to 4 of the Lighting Summary should be used to describe the installed lighting schedule, and the control devices associated with the building design. If necessary, make extra copies of the forms. The information on the L-1 parts 2 to 4 forms may be incorporated into equipment schedules on the plans along with light fixture information, rather than presented on the forms. If this is done, however, the same information should be included in one schedule and in a similar format as the forms.

Lighting Summary (L-1) Part 2

Luminaire Name: Record the description by name or type.

Lamp Type: Record the type of lamp (Incandescent, Fluorescent or High-Intensity discharge).

Watts/Lamp:Record the listed watts per lamp. For track and incandescent medium base socket fixture, see s. Comm 63.45 (4) for how to determine the watts of these types of luminaires. If track lighting is used and the fixtures are not shown on the Installed Lighting Schedule, 45 watts per foot of track is entered in this column.

Ballasts Type: Record the ballast type -- Standard Energy-Saving Magnetic (S), Electronic High Frequency* (E) or Other* (O). If Electronic High Frequency or Other ballast types are used, the exact ballast type and model number should be specified.

Number/Luminaire: Record the number of ballasts installed in each Luminaire.

Mandatory Automatic Controls (L-1) Part 3

The Mandatory Automatic Controls portion is where those devices to meet the mandatory control requirements are listed. This would include devices for building shut-off, individual room control, and control of exterior lights. If some mandatory controls meet the requirements of s. Comm 63.45 (2), the information should also be recorded on Part 4, Controls for Credit, if control credits are taken in the ILP calculation.

Control Location: Record the location of the control on the plans.

Control Identification: Record the symbol of the control on the plans.

Control Type: Record the type of certified control device used to meet the mandatory automatic control requirement.

Space Controlled: Record the location of controlled lights.

Typical controls may be covered by general notation.

Controls for Credit (L-1) Part 4

The Control for Credit portion is similar to the Mandatory Automatic Controls portion. The only difference is the last column.

Luminaires Controlled: Record the luminaire type and quantity controlled for credit.

Type: Record the same name as on the plans.

Number of Luminaires: Record the number of luminaires of that type that are controlled by the control type.

Typical controls may be covered by general notation.

Reviewer Notes

This space is used by the Department Plan Examiner during review of the submitted information.

EXTERIOR LIGHTING POWER WORKSHEET L-2

This worksheet is applicable to all projects.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Project Information section of the Lighting Summary (L-1) form.

Exterior Lighting Power Allowance -- ELPA

Area Description: This is a descriptor of each line. These descriptors match those in Comm Table 63.43.

Allowance: This is the allowance in either W/ft^2 or watts of lineal feet. These allowances match those in Comm Table 63.43.

Area or Lineal Feet in Proposed Design: Record the area (sq.ft.) or lineal footage (lf) as appropriate. These values should be project-wide values.

ELPA: Multiply the allowance from Column B by the area (or lineal footage) from Column C. Record the resultant ELPA in Column D. The values should be summed into the box marked "Total ELPA" at the bottom of the column.

Installed Exterior Lighting Power

Do not include luminaires that are exempted under s. Comm 63.42.

Fixture Type: Record the description of the luminaires that are included.

Number of Luminaires: Record the total number of similar luminaires in the project.

Watts per Luminaire: Record the input wattage for each luminaire, including the ballast.

Installed Wattage: Multiply the number of luminaires from Column B by the wattage per luminaire from Column C. Enter the resultant installed wattage in Column D. The values from all entries in the column should be summed into the box marked "Total ELP" at the bottom of the column.

INSTALLED INTERIOR LIGHTING POWER WORKSHEET L-3

The Installed Interior Lighting Power Worksheet (L-3) will be completed and submitted with all applications. Either the Complete Building/Area Category Method Worksheet (L-4), the Activity Method Worksheet (L-5), or System Analysis Design documentation will be included with L-3, depending on the ILPA calculation method chosen.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Project Information section of the Lighting Summary (L-1) form.

Installed Interior Lighting Power

The calculated interior lighting power to be installed is determined by completing this form. Do not include luminaires that are exempted under s. Comm 63.45. If necessary, make extra copies of this form. Use as many sheets as needed for the project.

Luminaire Name or ID No.: Record the name or symbol. It should be consistent with what is used in the lighting schedule.

Description: Record a short list of the technical features (i.e., luminaire size and type, lamp type and number, ballast type, lens/louver type).

Number of Luminaires: Record the quantity of each fixture type in the building. If track lighting is used and the fixtures are not shown on the plans, the length of the track is entered in this column.

(Tip: If control credits are to be used and all of any type of luminaires are not controlled or used with the same control, split the luminaries up over several lines, one for each control type.)

Watts per Luminaire: Record the total wattage of each luminaire type (including ballasts for fluorescent or high intensity discharge fixtures). For track and incandescent medium base socket fixtures, see s. Comm 63.45 (4) for how to determine the watts of these types of luminaires. If track lighting is used and the fixtures are not shown on the Installed Lighting Schedule, 45 watts per foot of track is entered in this column. The wattage may be a standard value from the data in Table A63.45. Nonstandard values not from Table A63.45 must be substantiated with manufacturer's data sheets.

Total Watts: Record the product of the quantity of each luminaire listed times its watts per luminaire. If credit for automatic lighting controls is not sought, the interior lighting power is the sum of this Column E.

LPAF for Automatic Controls: If lighting power control credits are used, enter the appropriate lighting power adjustment factor from Table 63.45. If this credit is not used, leave Columns F, G, and H blank.

Control Credit: Multiply the total watts of luminaires associated with the control of Column E by the LPAF of Column F. Record the resultant control credit in Column G.

Adjusted Watts: Subtract the control credit of Column G from the total watts of Column E. Record the remainder in Column H.

The sum of Column E (or Column H if control credits are used) is the calculated interior lighting power for the building. If more than one sheet is used, enter the total for all sheets. This total cannot be greater than the Interior Lighting Power Allowance calculated on worksheet L-4 or L-5.

COMPLETE BUILDING/AREA CATEGORY METHODS WORKSHEET L-4

This worksheet will be attached to L-3 whenever the Complete Building Method or the Area Category Method is used to calculate the Interior Lighting Power Allowance.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Project Information section of the Lighting Summary (L-1) form.

Interior Lighting Power Allowance

The Interior Lighting Power Allowance (ILPA) is determined by calculating the maximum total watts of lighting that may be installed. As noted on the Lighting Summary, L-1, there are four different methods that may be used. These methods may not be mixed in the same building permit application. This form is used when the ILPA is calculated by the Complete Building or Area Category Method.

Complete Building Method

This method may only be used when plans and specifications for the entire building are included in the application.

Building Type of Use: This is taken from Table 63.47 for the type of use of the building. If the building has a mixture of uses, the major use must be at least 80 percent of the conditioned floor area. If there is no major use, this method may not be used.

Watts per Square Foot: Record the allowed lighting power density in watts per square foot for this building type taken from Comm Table 63.47.

Complete Building Area: Record the conditioned floor area of the entire building, including the conditioned floor area of minor occupancies. See Comm 63.05 (6) for the definition of conditioned floor area.

Allowed Watts: Record the product of the watts per square foot times the complete building area. This becomes the Interior Lighting Power Allowance for the building.

Area Category Method

This method may be used when different primary function areas of a building are included in the application.

Primary Function: This is taken from Comm Table 63.48 for the primary function of the area. If the building has a mixture of functions, each function area must be listed separately.

Watts per Square Foot: Record the allowed lighting power density watts per square foot for this building type taken from Comm Table 63.48.

Area: Record the conditioned floor area (in square feet) of the primary function area measured from the inside of partitions.

Allowed Watts: Record the product of the watts per square foot times the primary function area. This becomes the allowed lighting power for the area.

The sum of the allowed lighting power for each primary function area is the Interior Lighting Power Allowance for the building.

ACTIVITY METHOD WORKSHEET L-5

This worksheet is applicable to all projects including those that use the Activity Method of s. Comm 63.49. If necessary, make extra copies of this form. Use as many sheets as needed for the project.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Project Information section of the Lighting Summary (L-1) form.

Interior Lighting Power Allowance – ILPA

Column A: Record the room number or room name. A range of similar rooms may also be entered.

Column B: Record the average ceiling height of the room in feet.

Column C: Record a description of each line item. The description shall match the appropriate description from Table 63.49.

Column D: Record any notes from Table 63.49. These notes may limit the Area Factor used in Activity Method calculations.

Column E: Record the appropriate unit lighting power density (UPD) from Table 63.49.

Column F: Record the floor area of the room (inside wall to inside wall, ft^2). Where multiple rooms are included in single line, this is the average area of each type of room and not the total area of all rooms.

Column G: Record the area factor from either s. Comm 63.49, Figure 63.49, or an applicable footnote from Table 63.49.

Column H: Record the number of similar spaces.

Column I: Multiply the UPD from Column E by the floor Column F by the area factor from Column G by the number of similar rooms from Column H. Record the resultant lighting power budget in Column I. The values from all entries in this column should be summed into the box marked "ILPA" at the bottom of the column.

LIGHTING SUMMARY

L-1 - Part 1 of 4

Visconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

Method of Interior Lighting Compliance (check one)

- ☐ Complete Building s. Comm 63.47
- ☐ Area Category s. Comm 63.48
- ☐ Activity s. Comm 63.49
- ☐ Other s. Comm 63.70-72

Basic Requirements	Prescriptive/Performance	Additional Data
☐ Exterior lighting not intended for 24-hour use controlled by photocell. Comm 63.50	Installed ELP ≤ ELPA Comm 63.43	Exterior Lighting Power Worksheet (L-2)
☐ Shut-off control in each space enclosed by ceiling-high partitions. Comm 63.50 (1) ☐ Controls to reduce lighting by 50%. Comm 63.50 (2) ☐ Controls to reduce lighting in daylit areas. Comm 63.50 (3) ☐ Automatic shut-off controls. Comm 63.50 (4) ☐ Display lighting separately switched on circuits ≤ 20 amps. Comm 63.50 (5) ☐ Hotel/motel guest rooms have master switches at the main door to turn off lights and receptacles. Comm 63.50 (7)		
☐ Exit signs have installed wattage of 20 watts or less. Comm 63.52 ☐ Fluorescent lamps use multiple lamp ballasts with tandem wiring as required. Comm 63.53	ILP ≤ ILPA Comm 63.47, 63.48, or 63.49 ☐ Lighting Power Control Credits Applied. Comm 63.45 ☐ Daylight Sensing Controls ☐ Occupancy Sensors ☐ Programmable Timing Controls ☐ Lumen Maintenance Controls	Interior Lighting Power Worksheet (L-3) Interior Lighting Power Allowance Worksheet (L-4) Activity Method Worksheet (L-5)

The information you provide may be used by other agency programs [Privacy Law, s. 15.04 (1)(m)].

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LIGHTING SUMMARY

L-1 - Part 2 of 4

Visconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

INSTALLED LIGHTING SCHEDULE

Luminaire Name or ID Number (e.g., Type 1, Type 2, etc.)	Lamps					Ballasts				Note to Field
	Type			No. of Lamps	Watts/Lamp	Type			No./Luminaire	
	I	F	H			S	E*	O*		

* Provide Supporting Documentation for total watts for lamp and ballast.

REVIEWER NOTES - For Department Use Only

Visconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

MANDATORY CONTROLS (s. Comm 63.50)

(Optional if included on plans - Use as many sheets as necessary)

Control Location (Room #)	Control Identification	Control Type (Occupancy Sens., Daylight, etc.)	Space Controlled	Note to Field

REVIEWER NOTES - For Department Use Only

Wisconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

CONTROLS FOR CREDIT (s. Comm Table 63.45)

(Optional if included on plans - Use as many sheets as necessary)

Control Location (Room # or Dwg.#)	Control Identification	Control Type (Occupant, Daylight, Dimming, etc.)	Luminaires Controlled		Note to Field
			Type	# of Lumin.	

REVIEWER NOTES - For Department Use Only

EXTERIOR LIGHTING POWER WORKSHEET

L-2

Wisconsin Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

EXTERIOR LIGHTING POWER ALLOWANCE - ELPA (s. Comm 63.43)

A Area Description	B Allowance (Table 63.43)	C Area or Lineal Feet in Proposed Design	D ELPA (B•C)
Exit (with or without canopy)	25 W/lf of door opening		
Entrance (without canopy)	30 W/lf of door opening		
High Traffic Entrance (with canopy)	10 W/ft^2 of canopied area		
Light Traffic Entrance (with canopy)	4 W/ft^2 of canopied area		
Loading Area	0.40 W/ft^2		
Loading Door	20 W/lf of door opening		
Building Exterior Surfaces or	0.25 W/ft^2 of illuminated		
Storage and Nonmanufacturing	0.20 W/ft^2		
Casual Use Areas (gardens, etc.)	0.10 W/ft^2		
Private Driveways or Walkways	0.10 W/ft^2		
Public Driveways or Walkways	0.15 W/ft^2		
Private Parking Lots	0.12 W/ft^2		
Public Parking Lots	0.18 W/ft^2		
		Total ELPA	

INSTALLED EXTERIOR LIGHTING POWER - ELP (s. Comm 63.42)

A Fixture Type	B Number of Luminaires Installed	C Watts per Luminaire (including ballast)	D Installed Watts (B•C)
		Total Installed ELP	

INSTALLED INTERIOR LIGHTING POWER WORKSHEET L-3

Wisconsin Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

INSTALLED INTERIOR LIGHTING POWER (s. Comm 63.45)

(Use as many sheets as necessary)

A Luminaire Name or ID No.	B Luminaire Description	C Number of Luminaires	D Watts per Luminaire (including ballast)	E Total Watts (C•D)	F LPAF for Automatic Controls (Table 63.45)	G Control Credit (E•F)*	H Adjusted Watts (E-G)

COMPLETE BUILDING/AREA CATEGORY METHOD WORKSHEET L-4

Visconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

INTERIOR LIGHTING POWER ALLOWANCE (ILPA) (s.Comm 63.47 or 63.48)

(Choose *one* method or use the Activity Method and Form L-5)

Complete Building Method

Building Type of Use From Table 63.47	Watts/ft²	Complete Bldg. Area	Allowed Watts

Area Category Method

Primary Function From Table 63.48	Watts/ft²	Area (ft sq.)	Allowed Watts
	Totals		
		ft² Area	Watts

ACTIVITY METHOD WORKSHEET

L-5

Wisconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

INTERIOR LIGHTING POWER ALLOWANCE (ILPA) (s. Comm 63.49)

(Use as many sheets as necessary)

A	B	C	D	E	F	G	H	I
Room Number or Name	Ceiling Height (ft)	Area/Activity Description (Table 63.49)	Note	UPD (W/ft^2)	Floor Area (ft^2)	Area Factor*	# of Identical Spaces	LPB (W) (E•F•G•H)

* Note b: Office Categories 2 & 3 AF shall not exceed 1.00
Note d: Office Category 1 AF shall not exceed 1.55
Area Factors less than 1.0, equal 1.0
Area Factors greater than 1.8 shall equal 1.8

Sheet Total ILPA

Total ILPA from all sheets

IV. HVAC SYSTEMS PLAN CHECK DOCUMENTS

This section describes the forms and procedures for documenting compliance of Heating, Ventilation and Air Conditioning (HVAC) systems with the **energy efficiency** requirements of the code. It does not describe the details of the requirements; these are presented in the code. Determination of compliance will be based on the actual code section. The following discussion is addressed to the designer preparing construction documents and compliance statements, and to the plan reviewers who examine those documents for compliance with the code.

Note: These forms cannot be used to demonstrate compliance with the Ch. Comm 64 ventilation requirements. That information must be provided separately.

The use of each form is briefly described below. The complete instructions for each form are presented in the following subsections.

H-1: HVAC Systems Summary.

This information is required for every project involving heating, ventilation and air conditioning equipment & systems.

H-2: HVAC Prescriptive Worksheet.

This information is applicable to projects that demonstrate compliance through a prescriptive means by following the requirements of Subchapter IV. It is not applicable to projects that demonstrate compliance through the System Analysis Design method of ss. Comm 63.70-72.

H-3: HVAC Equipment Summary.

This information is required for every project.

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HVAC SYSTEMS SUMMARY H-1

This worksheet is applicable to all projects

Project Information

This information asks for the project name and address and those people responsible for the HVAC design and compliance forms. The project name and address must match the information given on the building envelope forms. Check the box as indicated if the System Analysis Design method will be used to show compliance.

Basic Requirements Check List

All of the boxes in this column must be filled with either a check or "X" to indicate affirmation or "N/A" to indicate that the item or issue is not applicable.

Worksheet

If using the System Analysis Design method, the HVAC Prescriptive worksheet (H-2) does not need to be completed. Fill in the box with a check or "X" if it is included.

Special Considerations

Fill in these boxes with a check or "X" where applicable.

HVAC PRESCRIPTIVE WORKSHEET H-2

This worksheet provides detailed information on zone controls and economizer controls. It is not required if the System Analysis Design method is used.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the HVAC Systems Summary (H-1) form.

Prescriptive Requirements

Each of the requirements is organized in a similar fashion. A major check box certifies compliance with each requirement. Each one of these is followed by a series of minor check boxes that are used to identify exceptions to that requirement. All of the major check boxes must be filled in with either a check, "X," or "N/A." In addition, a check or "X" should be placed in each applicable exception box. On the line adjacent to these exception descriptions, identify the systems or equipment to which the exception applies.

HVAC EQUIPMENT SUMMARY H-3

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the HVAC Equipment Summary (H-1) form.

Equipment Efficiency Information

Each piece of HVAC equipment that has efficiency requirements under ASHRAE 90.1 should be listed here. See Code Appendix A63.20 for reprinted standards.

System ID Number: List the system identification number or zone identification number or other descriptor.

Unit Type and Category: List the unit type and category from the appropriate table.

Table Number: Give the table number, Table A63.20-1 through A63.20-15 of the Code Appendix, on which the equipment and its required efficiency are listed.

Rated Output (Btu/h): This is the unit capacity (heating or cooling as appropriate) at rated conditions. The rating conditions should match those from the reference column of the corresponding table.

Unit Efficiency: For each unit, list the efficiency of the selected unit at rated conditions on the left and the required minimum efficiency from the corresponding table on the right. Under "Rating Units" place "EER," "IPLV," "ET," etc., as applicable.

HVAC SYSTEMS WORKSHEET H-1

Wisconsin Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

☐ Check here if using System Analysis Design (see Comm 63.70-72)

Basic Requirements Checklist	Additional Data
Design	
☐ Load calculations involve the use of the minimum interior temperatures of Table Comm 64.05 for heating and Comm 63.23(2) for cooling as well as meet or exceed the minimum heating or maximum cooling outdoor design temperatures given in code. Comm 63.23(3)	HVAC Prescriptive Worksheet (H-2)
☐ Cooling pull-down/heating pick-up loads were either calculated or did not exceed 10%/30% of design load. Comm 63.23 (7)	
☐ Equipment is properly sized. Comm 63.24	
☐ Process loads are served by separate systems from comfort conditioning loads. Comm 63.25	
☐ HVAC fan and pumping system motors meet efficiency standards. Comm 63.32	
Controls	
☐ Temperature controls are provided as required: one for each HVAC system and individual controls for each thermal zone. Comm 63.26	
☐ Thermostatic controls meet the setpoint adjustment requirements: heating down to 55°F, cooling setpoints up to 85°F, and deadbands of 5°F minimum. Comm 63.26	
☐ Systems do not reheat, recool or mix air. Comm 63.27*	
☐ Variable volume systems have minimum stops adjusted as required. Comm 63.27*	
☐ Each system that does not need to operate continuously is provided with either automatic time or setback/setup controls. Comm 63.27 (3)	
☐ Ventilation supply systems and exhaust systems are provided with either gravity or motorized dampers as required to limit infiltration during off hours. Comm 64.19 (5)	
☐ Combustion air dampers provided per Comm 64.09 (2).	
☐ A humidistat shall be provided if a system is equipped with a means for adding moisture to maintain specific humidity levels in a zone or zones. Comm 63.28	
☐ Fan cooling systems employ air or water economizer controls. Comm 63.31*	
☐ Heat pumps with supplementary heaters have controls to prevent heater operation when heating load can be met by heat pump. Comm 63.22	
Completion & Construction	
☐ Pipe insulation meets the requirements of Comm Table 63.29-1. Duct insulation meets the requirements of Table 63.29-2. Comm 63.29	
☐ The plans or specifications spell out the requirements for leakage testing ductwork. Comm 64.34	
☐ Low and medium pressure supply ductwork which is located outside of the conditioned space is sealed in accordance with SMACNA Seal Class C. Comm 64.34	
☐ Complying air and water system balancing procedures are spelled out on the plans or in the specifications. Comm 64.53	
☐ Testing, adjusting and calibration of control systems is spelled out on the plans or in the specifications. Comm 64.43 and Comm 64.53	
☐ Plans or specifications require that equipment is provided with operation and maintenance manuals and system schematics. Comm 64.52	

Special Considerations: ß Heat recovery utilized ß Continuous system operation required

* If the ASHRAE 90.1 Energy Cost Budget method is used for system analysis design, these items do not have to be met prescriptively. Complete documentation must be provided.

The information you provide may be used by other agency programs [Privacy Law, s. 15.04 (1)(m)]. SBD-10375 (R.10/98)

HVAC PRESCRIPTIVE WORKSHEET H-2

Wisconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

Zone Controls - Constant Volume Systems Comm 63.27

☐ Systems have controls which prevent simultaneous heating and cooling including: reheat, recool, mixing of heated and cooled airstreams, and simultaneous heating and cooling by separate systems within a zone.

System or Zone Number or ID

Exceptions

☐ 75% of reheat energy is from site-recovered or solar energy (provide documentation). _____

☐ System serves zones with process-driven humidity requirements. _____

☐ Multiple reheat systems serving multiple zones with controls or dual duct and multizone systems with controls to reset supply temperatures per Paragraphs (f), (g), or (n). _____

☐ Zones with a peak supply of 150 cfm or less or multizone systems with reheating or recooling limited to 5,000 cfm or 20%, whichever is less. _____

Zone Controls - Variable Volume Systems Comm 63.27

☐ Before reheating or mixing of airstreams occur, zone controls must reduce the air supply to a minimum volume which is no greater than the largest of the following: (1) 30% of the peak supply volume, (2) the minimum required to meet ventilation requirements of Comm 64.05, or (3) 0.4 cfm/ft^2 of zone conditioned floor area.

System or Zone Number or ID

Exceptions

☐ There is no reheating or mixing of airstreams in these zones. _____

☐ Pressurization requirements prevent such reduction of airflow (provide documentation). _____

☐ 75% of reheat energy is from site-recovered or solar energy (provide documentation). _____

☐ System serves zones with process-driven humidity requirements. _____

☐ Zones with a peak supply of 150 cfm or less or multizone systems with reheating or recooling limited to 5,000 cfm or 20%, whichever is less. _____

Economizer Controls Comm 63.31

☐ Fan-cooling systems are equipped with complying air or water economizers.

System Number or ID

Exceptions

☐ System capacity is less than either 2,000 cfm or 62,000 Btuh total cooling for a split system or less than 55,000 Btuh for all other types. _____

☐ Economizers would not save energy (provide documentation). _____

☐ Benefit of air economizer would be offset by increased energy use for humidity control. _____

HVAC EQUIPMENT SUMMARY

H-3

Wisconsin
Department of Commerce

Transaction ID #	Submitter's Name
Owner's Name	Date
Building Location (Number & Street)	City Village Township of

System ID Number	Unit Type and Category From Tables A63.20-1 to 15 of Ch. 63 Appendix	Table Number	Rated Output (Btu/hr)	Unit Efficiency		
				Rating Units	Rated	Min. Required
						≥
						≥
						≥
						≥
						≥
						≥
						≥
						≥
						≥
						≥
						≥
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						≥
						≥
						≥
						≥
						≥

Note: Where more than one requirement is made for a single piece of equipment (such as full-load and part-load ratings), provide information on subsequent lines

A-63.05 (13) Daylit Area is the space on the floor that is the larger of (a) or (b);

(a) 1. For areas daylit by vertical glazing, the daylit area has a length of 15 feet, or the distance on the floor, perpendicular to the glazing, to the nearest 60-inch or higher opaque partition, whichever is less; and a width of the window plus either 2 feet on each side, the distance to an opaque partition, or one-half the distance to the closest skylight or vertical glazing, whichever is least.

2. For areas daylit by horizontal glazing, the daylit area is the footprint of the skylight plus, in each of the lateral and longitudinal dimensions of the skylight, the lesser of the floor-to-ceiling height, the distance to the nearest 60-inch or higher opaque partition, or one-half the horizontal distance to the edge of the closest skylight or vertical glazing.

(b) The daylit area calculated using a method acceptable to the department. Such methods include DOE 2.1D and E, Superlite, Quicklite and other computer-based models that determine the daylit area based on modeling the features of the space.

Figures A63.05-A and A63.05-B illustrate the determination of daylit areas. The dimensions given in Figure A63.05-B are for demonstration only and will vary with each space.

Figure A63.05-A Window Daylit Area

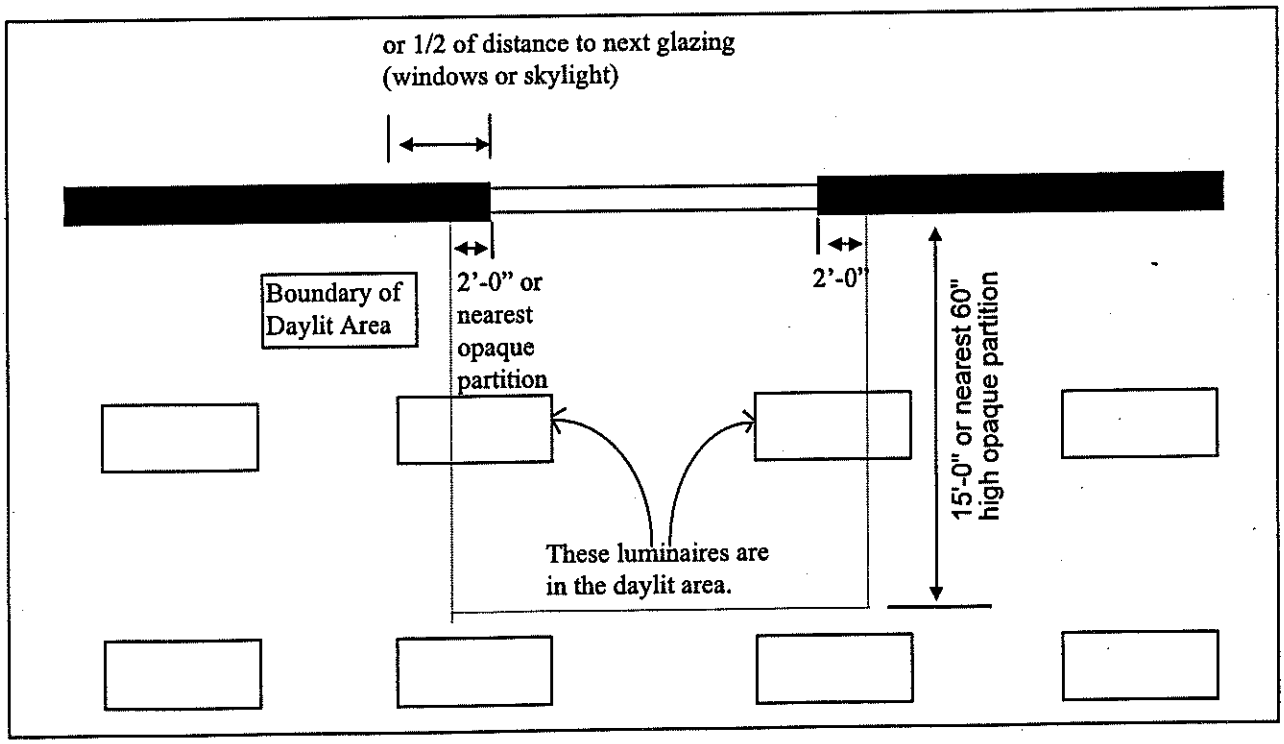
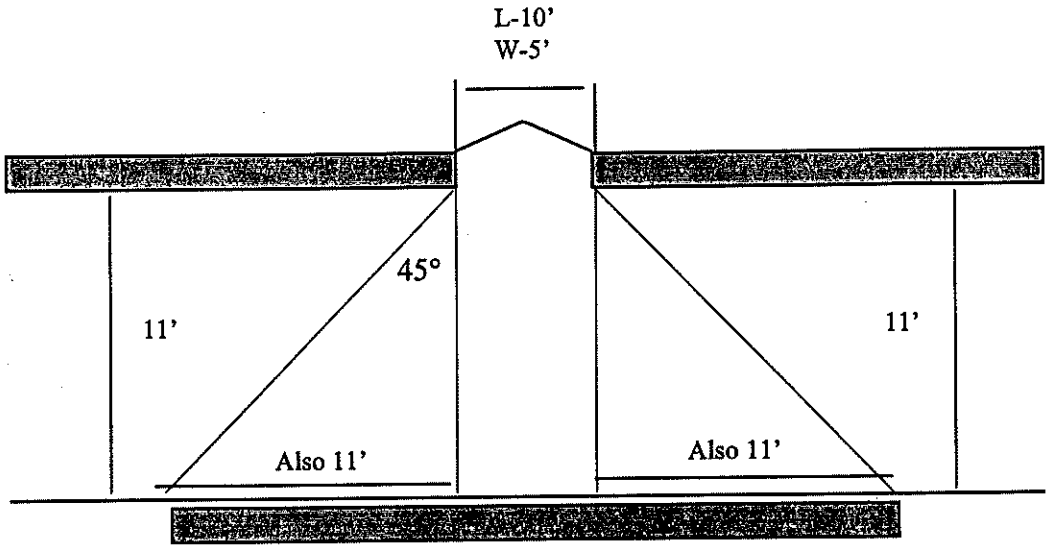


Figure A63.05-B Skylight Daylit Area



A63.12 Section 8.4.8 of ASHRAE Standard 90.1 requires the following criteria to be met for exemption of skylights:

1) The U-value of the opaque portion of the roof must be less than the criteria given in Figure 63.15;

2) Automatic daylighting controls are required;

3) The skylight U-value must be less than 0.70 Btu/hr°F;

4) The skylight curb U-value must be less than 0.21 Btu/hr°F;

5) The air leakage must be less than 0.5 cfm/ft^2 of skylight;

6) The maximum area of the skylight will depend on the visible light transmittance and whether shading is provided for the skylight.

Table A63.12
Maximum Percent Skylight Area

Visible Light Transmission (VLT)	Light Level (fc)	Range of Lighting Power (W/ft^2)				
		<1.00	1.01-1.50	1.51-2.00	2.01-2.50	>2.50
0.75	30	2.3	3.4	4.5	5.6	5.6
	50	2.5	4.0	5.5	7.0	7.0
	70	2.8	4.6	6.4	8.2	8.2
0.50	30	3.6	5.1	6.6	8.1	8.1
	50	3.9	6.0	8.1	10.2	10.2
	70	4.2	6.9	9.6	12.3	12.3

The maximum allowable skylight area may be increased by 50 percent if shading devices are installed that block more than 50 percent of the solar gain during the peak cooling design condition. If this credit is taken, calculations on data must be prepared that show that solar gains are reduced by 50 percent. Exterior shading devices such as fixed louvers on opaque parapet walls will qualify if all direct solar radiation is eliminated during the peak design condition. Integral, interior or movable exterior shading devices will qualify if they cut the shading coefficient in half when closed.

This summary is provided for general information only. For exact compliance criteria, see the ASHRAE 90.1 Standard.

A63.15 (3)(b) Heat Capacity (HC) of an assembly is the amount of heat necessary to raise the temperature of all the components of a unit area in the assembly one degree F. It is calculated as the sum of the average thickness times the density times the specific heat for each component, and is expressed in Btu per square foot per degree F.

Heat capacity describes the thermal mass of an assembly. It is used in the prescriptive envelope requirements for walls and floors, where the U-value criterion is tied to the heat capacity of the assembly.

For a single layer, homogeneous wall or floor, such as poured concrete walls with no applied finish materials, heat capacity can be calculated by multiplying the weight of the wall (pounds per square foot) times the specific heat. For instance, a 6-inch concrete wall (specific heat = 0.20 Btu/lb°F) with a weight of 70 pounds per square foot would have an HC of 70 x 0.20 or 14 Btu/sf°F. The wall weight is calculated from the density (pounds per square foot); density divided by 12 and multiplied by the thickness (inches) gives the wall weight (pounds per square foot).

For assemblies made up of many layers, HC may be calculated separately for each layer and summed.

The following Table A63.15-1 lists the thermal properties of typical, thermally massive construction materials.

The heat capacity of unit masonry walls, such as those made of concrete block or brick, are too complicated to calculate by this method. Tables A63.15-2 and A63.15-3 include HC calculated for a large variety of masonry wall assemblies. These tables also give the U-value (U) and the total R-value (Rt) for the wall, including interior and exterior air films.

A63.15-1 Thermal Mass Properties

Matter	Conductivity $\frac{\text{Btu. in}}{\text{hr.sf.°F}}$	Density (lbs/cf)	Specific Heat (Btu/lb°F)
Adobe	0.33	120	0.20
Heavy Concrete	0.98	140	0.20
Lightweight Concrete	0.36	85	0.20
Gypsum	0.09	50	0.26
Masonry Veneer	0.62	127	0.20
Masonry Infill	0.44	120	0.20
Concrete Masonry Unit	0.59	105	0.20
Grouted Concrete Masonry Unit	1.00	134	0.20
Stucco	0.47	105	0.20
Tile in Mortar	0.67	120	0.20
Solid Wood (fir)	0.07	32	0.33
From: ASHRAE Handbook of Fundamentals, Table 4, Chapter 22			

Table A63.15-2 Properties of Hollow Unit Masonry Walls

Thickness/Material Type			Core Treatment		
			Solid Grout	Partly Grouted with Ungrouted Cells	
				Empty	Insulated
12"	LW CMU	U	0.51	0.43	0.30
		R_t	2.0	2.3	3.3
		HC	23.0	14.8	14.8
	MW CMU	U	0.54	0.46	0.33
		R_t	1.9	2.2	3.0
		HC	23.9	15.6	15.6
	NW CMU	U	0.57	0.49	0.36
		R_t	1.8	2.0	2.8
		HC	24.8	16.5	16.5
10"	LW CMU	U	0.55	0.46	0.34
		R_t	1.8	2.2	2.9
		HC	18.9	12.6	12.6
	MW CMU	U	0.59	0.49	0.37
		R_t	1.7	2.1	2.7
		HC	19.7	13.4	13.4
	NW CMU	U	0.62	0.52	0.41
		R_t	1.6	1.9	2.4
		HC	20.5	14.2	14.2
8"	LW CMU	U	0.62	0.50	0.37
		R_t	1.6	2.0	2.7
		HC	15.1	9.9	9.9
	MW CMU	U	0.65	0.53	0.41
		R_t	1.5	1.9	2.4
		HC	15.7	10.5	10.5
	NW CMU	U	0.69	0.56	0.44
		R_t	1.4	1.8	2.3
		HC	16.3	11.1	11.1
	Clay Unit	U	0.57	0.47	0.39
		R_t	1.8	2.1	2.6
		HC	15.1	11.4	11.4
6"	LW CMU	U	0.68	0.54	0.44
		R_t	1.5	1.9	2.3
		HC	10.9	7.9	7.9
	MW CMU	U	0.72	0.58	0.48
		R_t	1.4	1.7	2.1
		HC	11.4	8.4	8.4
	NW CMU	U	0.76	0.61	0.52
		R_t	1.3	1.6	1.9
		HC	11.9	8.9	8.9
	ClayUnit	U	0.65	0.52	0.45
		R_t	1.5	1.9	2.2
		HC	11.1	8.6	8.6

Notes:

LW CMU is a Light Weight Concrete Masonry Unit per ASTM C 90, calculated at 105 PCF density.

MW CMU is a Medium Weight concrete Masonry Unit per ASTM C 90, calculated at 115 PCF density.

NW CMU is a Normal Weight Concrete Masonry Unit per ASTM C 90, calculated at 125 PCF density.

Clay Unit is a hollow clay unit per ASTM C 652, calculated at 130 PCF density.

Values include thermal resistance of interior air film (R = 0.68) and exterior air film (R = 0.17).

Calculations based on Energy Calculations and Data, CMACN, 1986.

Grouted Cells at 32" x 48" in partly grouted walls

[Source: Berkeley Solar Group; Concrete Masonry Association of California and Nevada (CMACN).]

Table A63.15-3 Properties of Solid Unit Masonry and Solid Concrete Walls

		Layer Thickness in Inches									
Type		3	4	5	6	7	8	9	10	11	12
LW CMU	U	na	0.71	0.64	na	na	na	na	na	na	na
	R_t	na	1.4	1.6	na	na	na	na	na	na	na
	HC	na	7.00	8.75	na	na	na	na	na	na	na
MW CMU	U	na	0.76	0.70	na	na	na	na	na	na	na
	R_t	na	1.3	1.4	na	na	na	na	na	na	na
	HC	na	7.67	9.58	na	na	na	na	na	na	na
NW CMU	U	0.89	0.82	0.76	na	na	na	na	na	na	na
	R_t	1.1	1.2	1.3	na	na	na	na	na	na	na
	HC	6.25	8.33	10.42	na	na	na	na	na	na	na
ClayUnit	U	0.80	0.72	0.66	na	na	na	na	na	na	na
	R_t	1.3	1.4	1.5	na	na	na	na	na	na	na
	HC	6.30	8.40	10.43	na	na	na	na	na	na	na
Concrete	U	0.96	0.91	0.86	0.82	0.78	0.74	0.71	0.68	0.65	0.63
	R_t	1.0	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.6
	HC	7.20	9.60	12.00	14.40	16.80	19.20	21.60	24.00	26.40	28.80

Notes:
LW CMU is a Light Weight Concrete Masonry Unit per ASTM C 90 or 55, calculated at 105 PCF density.

MW CMU is a Medium Weight concrete Masonry Unit per ASTM C 90 or 55, calculated at 115 PCF density.

NW CMU is a Normal Weight Concrete Masonry Unit per ASTM C 90 or 55, calculated at 125 PCF density.

Clay Brick is a clay unit per ASTM C 62, calculated at 130 PCF density.

Concrete is structural poured or precast concrete, calculated at 144 PCF density.

Calculations based on Energy Calculations and Data, CMACN, 1986.

Values include thermal resistance of interior air film (R = 0.68) and exterior air film (R = 0.17).

[Source: Berkeley Solar Group; Concrete Masonry Association of California and Nevada (CMACN).]

A-63.18 (2)(a) 3.

Default U-Values for Wood and Steel Swinging Doors Btu/(h-ft^2-°F) - Part I

Nominal Thickness (Inches)	Description	No. Storm Door	Wood Storm Door[c]	Metal Storm Door[d]
Wood Doors [a,b]				
1 3/8	Panel door with 7/16" panels[e]	0.57	0.33	0.37
1 3/8	Hollow-core flush door	0.47	0.30	0.32
1 3/8	Solid-core flush door	0.39	0.26	0.28
1 3/4	Panel door with 7/16" panels[e]	0.54	0.32	0.36
1 3/4	Hollow-core flush door	0.46	0.29	0.32
1 3/4	Panel door with 1 1/8" panels[e]	0.39	0.26	0.28
1 3/4	Solid-core flush door	0.33	0.25	0.28
2 1/4	Solid-core flush door	0.27	0.20	0.21
Steel Doors[b]				
1 3/4	Fiberglass or mineral wool core with steel stiffeners, no thermal break[f]	0.60	na	na
1 3/4	Paper honeycomb core without thermal break[f]	0.56	na	na
1 3/4	Solid urethane foam core without thermal break[f]	0.40	na	na
1 3/4	Solid fire-rated mineral fiberboard core without thermal break[f]	0.38	na	na
1 3/4	Polystyrene core without thermal break (18 gage Commercial steel)[f]	0.35	na	na
1 3/4	Polyurethane core without thermal break (18 gage Commercial steel)[f]	0.29	na	na
1 3/4	Polyurethane core without thermal break (24 gage Commercial steel)[f]	0.29	na	na
1 3/4	Polyurethane core with thermal break and perimeter (24 gage Commercial steel)[f]	0.20	na	na
1 3/4	Solid urethane foam core with thermal break[a]	0.19	0.16	0.17

Note: All U-Values for exterior doors in this table are for doors with no glazing, except for the storm doors which are in addition to the main exterior door. Any glazing area in exterior doors shall be included with the appropriate glass type and analyzed as fenestration. Interpolation and moderate extrapolation are permitted for door thicknesses other than those specified. In order to take credit for a thermal break, the door must have a thermal break in both the door slab and the frame.

[a] Values are based on a nominal 32" by 80" door size with no glazing.

[b] U-values include the thermal resistance of air films. Outside air conditions: 15 mph wind speed, 0°F air temperature; inside air conditions: natural convection, 70°F air temperature.

[c] Values for wood storm door are for approximately 50% glass area.

[d] Values for metal storm door are for any percent glass area.

[e] 55% panel area.

[f] ASTM C 236 hotbox data on a nominal 3' x 7' door size with no glazing.

Default U-Values for Sliding and Roll-Up Doors Btu/h-ft^2-°F) - Part II

Door Description	**Overall U-Factor**
Uninsulated, single-layer	1.15
Nominal 2" thick with 1 3/4" polyurethane foam core and vinyl thermal breaks and section joint seals	0.14
Nominal 3" thick with 2 7/8" expanded polystyrene core and continuous vinyl extrusion to form a thermal break and weather-tight seal along section joint	0.12
Other doors	Use value from most similar swinging door above

Note: See s. Comm 51.06 for thermal barrier requirements for foam plastic insulation.

A63.20 Tables A63.20-1 through 10 specify the ASHRAE 90.1-1989 efficiency standards for equipment not covered by federal efficiency standards, but are covered by s. Comm 63.20.

Table A63.20-1
Standard Rating Conditions and Minimum Performance, Unitary Air Conditioners and Heat Pumps --Air-Cooled, Electrically Operated, <135,000 Btu/h Cooling Capacity-- Except Packaged Terminal and Room Air Conditioners

Reference Standards[a]	Category	Sub-Category & Rating Condition (Outdoor Temp. °F)	Minimum Performance[c]
ARI 210/240-89	<65,000 Btu/h Cooling Capacity Cooling Mode[b]	Seasonal Rating Split System Single Package	10.0 SEER 9.7 SEER
	≥65,000 and <135,000 Btu/h Cooling Mode	Standard Rating (95°F db)	8.9 EER
		Integrated Part Load Value (80°F db)	8.3 IPLV
	<65,000 Btu/h Cooling Capacity Heating Mode (Heat Pump)[b]	Seasonal Rating Split System Single Package	6.8 HSPF 6.6 HSPF
	≥65,000 and<135,000 Btu/h Cooling Capacity Heating Mode	Split System & Single Package High Temp. Rating (47°F db/43°F wb) Low Temp. Rating (17°F db/15°F wb)	3.0 COP 2.0 COP

[a] For detailed references, see ASHRAE Standard 90.1.

[b] Exception: the following equipment is not covered by s. Comm 63.20, but is covered by the National Appliance Energy Conservation Act (NAECA) of 1987 (Public Law 100-12): central air conditioners other than packaged terminal air conditioners which are powered by single phase electric current, air cooled, rated below 65,000 Btu per hour, not contained within the same cabinet as a furnace, the rated capacity of which is above 225,000 Btu per hour, and is a heat pump or a cooling unit only; and Heat pumps other then packaged terminal heat pumps which consist of one or more assemblies, powered by single-phase electric current, rated below 65,000 Btu per hour, utilizing an indoor conditioning coil, compressor, and refrigerant-to-outdoor air heat exchanger to provide air heating, and may also provide air cooling, dehumidifying, humidifying circulating, and air cleaning.

[c] COP = Coefficient of Performance, EER = Energy Efficiency Ratio, ILPV = Integrated Part Load Value. See reference documents for detailed definitions.

Table A63.20-2
Standard Rating Conditions and Minimum Performance, Unitary Air Conditioners and Heat Pumps--Evaporatively Cooled, Electrically Operated, Cooling Mode <135,000 Btu/h Cooling Capacity--Except Packaged Terminal and Room Air Conditioners

Reference Standards[a]	Category	Rating Condition °F Indoor Temp. Outdoor Temp.	Minimum Performance[b]
ARI 210/240-89	<65,000 Btu/h Cooling Capacity	Standard Rating 95°F db/75°F wb	9.3 EER
CTI 201 (86)	<65,000 Btu/h	Integrated Part Load Value (80°F db/67°F wb)	8.5 IPLV
	≥65,000 but <135,000 Btu/h	Standard Rating 95°F db/75°F wb	10.5 EER
	≥65,000 but <135,000 Btu/h	Integrated Part Load Value (80°F db/67°F wb)	9.7 IPLV

[a] For detailed references, see ASHRAE Standard 90.1.
[b] EER = Energy Efficiency Ratio, ILPV = Integrated Part Load Value. See reference documents for detailed definitions.

Table A63.20-3
Standard Rating Conditions and Minimum Performance, Water-Cooled Air Conditioners and Heat Pumps -- Electrically Operated and Cooling Mode <135,000 Btu/h Cooling Capacity

Reference Standards[a]	Category	Rating Condition °F Indoor Air Temp. Entering Water Temp.	Minimum Performance[b]
Water-Source Heat Pump ARI 320-86 CTI 201 (86)	<65,000 Btu/h Cooling Capacity	Standard Rating 85	9.3 EER
		Low Temperature Rating 75	10.2 EER
	≥65,000 but <135,000 Btu/h Cooling Capacity	Standard Rating 85	10.5 EER
Groundwater Source Heat Pumps ARI 325-85	<135,000 Btu/h Cooling Capacity	Standard Rating 70	11.0 EER
		Low Temperature Rating 50	11.5 EER
Water-Cooled Unitary Air Conditioners ARI 210/240-89 CTI 201 (86)	<65,000 Btu/h Cooling Capacity	Standard Rating 85	9.3 EER
		Integrated Part Load Value 75	8.3 IPLV
	≥65,000 <135,000 Btu/h Cooling Capacity	Standard Rating 85	10.5 EER

[a] For detailed references, see ASHRAE Standard 90.1.
[b] EER = Energy Efficiency Ratio, ILPV = Integrated Part Load Value. See reference documents for detailed definitions.

Table A63.20-4
Standard Rating Conditions and Minimum Performance, Packaged Terminal Air Conditioners and Heat Pumps--Air-Cooled, Electrically Operated[a]

Reference Standards[c]	Category PTACs & PTAC Heat Pumps	Sub-Category & Rating Conditions (Outdoor Temp. °F)	Efficiency Rating	Minimum Performance[b]
ARI 310-90	Cooling Mode	Standard Rating (95°F db)	EER	10.0 - (0.16 x Cap./1000)
		Low Temp. Rating (82°F db)	EER	12.2 - (0.20 x Cap./1000)
ARI 380-90	Heating Mode	Standard Rating (47°F db/43°F wb)	COP	2.9 - (0.026 x Cap./1000)

[a] For multicapacity equipment, the minimum performance shall apply to each capacity step provided. Multicapacity refers to manufacturer published ratings for more than one capacity mode allowed by the product's controls.

[b] Cap. means the rated cooling capacity of the product in Btu/h in accordance with the cited ARI Standard. If the unit's capacity is less than 7000 Btu/h, use 7000 Btu/h in the calculation. If the unit's capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculation. COP = Coefficient of Performance, EER = Energy Efficiency Ratio. See reference documents for detailed definitions.

[c] For detailed references, see ASHRAE Standard 90.1.

Table A63.20-5
Standard Rating Conditions and Minimum Performance, Water-Source and Groundwater-Source Heat Pumps --Electrically Operated, <135,000 Btu/h Cooling Capacity

Reference Standards[c]	Rating Condition °F[a]	Minimum Performance[d]
Water-Source Heat Pumps ARI 320-86 CTI 201-(86)	Standard Rating 70°F Entering Water[b]	3.8 COP
Groundwater-Source Heat Pumps ARI 325-85	1. High Temperature Rating 70°F Entering Water[b]	3.4 COP
	2. Low Temperature Rating 50°F Entering Water[b]	3.0 COP

[a] Air entering indoor section 70°F db/60°F wb (max.)

[b] Water flow rate per manufacturer's specifications.

[c] For detailed references, see ASHRAE Standard 90.1.

[d] COP = Coefficient of Performance. See reference documents for detailed definitions.

Table A63.20-6
Standard Rating Conditions and Minimum Performance, Large Unitary Air Conditioners and Heat Pumps-- Electrically Operated >135,000 Btu/h Cooling Capacity

Category Reference Standards[c]	Efficiency Rating[d]	Minimum Performance	
Air Conditioners[a] Air Cooled ARI 360-86	EER	≤760,000 Btu/h: 8.5	>760,000 Btu/h: 8.2
	IPLV	7.5	
Air Conditioners[a] Water/Evaporatively Cooled ARI 360-86 CTI 201-86	EER	9.6	
	IPLV	9.0	
Heat Pumps[a] Air Cooled-Cooling Air Cooled-Heating ARI 340-86	EER	<760,000 Btu/h: 8.5	≥760,000 Btu/h: 8.2
	IPLV	7.5	
	COP (47°F)	2.9	
	COP (17°F)	2.0	
Condensing Units[b] Air Cooled ARI 365-87	EER	9.9	
	IPLV	11.0	
Condensing Units[b] Water/Evaporatively Cooled ARI 365-87 CTI 201-86	EER	12.9	
	IPLV	12.9	

[a] For units that have a heating section, deduct 0.2 from all required EERs and IPLVs

[b] Condensing unit requirements are based on single-number ratings defined in paragraph 5.1.3.2 of ARI Standard 365.

[c] For detailed references, see ASHRAE Standard 90.1.

[d] COP = Coefficient of Performance, EER = Energy Efficiency Ratio, ILPV = Integrated Part Load Value. See reference documents for detailed definitions.

Table A63.20-7
Standard Rating Conditions and Minimum Performance, Water Chilling Packages -- Water and Air Cooled and Electrically Operated

Reference Standards[b]	Category	Efficiency Rating[c]	Minimum Performance
ARI 550-90 ARI 590-86 CTI 201-86	Water-Cooled		
	≥300 Tons	COP	5.2[a]
		IPLV	5.3[a]
	≥150 Tons but <300 Tons	COP	4.2
		IPLV	4.5
	<150 Tons	COP	3.8
		IPLV	3.9
	Air-Cooled With Condenser		
	≥150 Tons	COP	2.5
		IPLV	2.5
	<150 Tons	COP	2.7
		IPLV	2.8
	Air-Cooled Without Condenser		
	All Capacities	COP	3.1
		IPLV	3.2

[a] Where R-22, or CFC refrigerants with ozone depletion factors less than or equal to those for R-22 is used, these requirements are reduced to 4.7 COP and 4.8 IPLV.

[b] For detailed references, see ASHRAE Standard 90.1.

[c] COP = Coefficient of Performance, EER = Energy Efficiency Ratio, ILPV = Integrated Part Load Value. See reference documents for detailed definitions.

Table A63.20-8
Standard Rating Conditions and Minimum Performance, Gas- and Oil-Fired Boilers

Reference[b]	Category	Rating Condition	Minimum Performance[c]
ANSI Z21.13-87 H.I. Htg. Boiler Std. 86 ASME PTC 4.1-64 U.L. 795-73	Gas-Fired ≥300,000 Btu/h	1. Max. Rated Capacity[a] Steady-State	E_c 80%
		2. Min. Rated Capacity[a] Steady-State	E_c 80%
U.L. 726-90 H.I. Htg. Boiler Std. 86 ASME PTC 4.1-64	Oil-Fired ≥300,000 Btu/h	1. Max. Rated Capacity[a] Steady-State	E_c 83%
		2. Min. Rated Capacity[a] Steady-State	E_c 83%
H.I. Htg. Boiler Std. 86 ASME PTC 4.1-64	Oil-Fired (Residual) ≥300,000 Btu/h	1. Max. Rated Capacity[a] Steady-State	E_c 83%
		2. Min. Rated Capacity[a] Steady-State	E_c 83%

[a] Provided and allowed by the controls.

[b] For detailed references, see ASHRAE Standard 90.1.

[c] E_c = Combustion efficiency, 100%-flue losses.

Table A63.20-9
Standard Rating Conditions and Minimum Performance, Warm Air Furnaces and Combination Warm Air Furnaces/Air Conditioning Units

Reference[b]	Category	Rating Condition	Minimum Performance[c]
ANSI Z21.47-90	Gas-Fired ≥225,000 Btu/h	1. Max. Rated Capacity[a] Steady-State	E_t 80%
		2. Min. Rated Capacity[a] Steady-State	E_t 78%
U.L. 727-86	Oil-Fired[d] ≥225,000 Btu/h	1. Max. Rated Capacity[a] Steady-State	E_t 81%
		2. Min. Rated Capacity[a] Steady-State	E_t 81%

[a] Provided and allowed by the controls.

[b] For detailed references, see ASHRAE Standard 90.1.

[c] E_t = Thermal efficiency, 100%-flue losses. See referenced document for detailed definition.

Table A63.20-10
Warm Air Duct Furnaces and Unit Heaters

Reference[b]	Category	Rating Condition	Minimum Performance[c]
ANSI Z83.9-90	Duct Furnaces Gas-Fired	1. Max. Rated Capacity[a] Steady-State	E_t 78%
		2. Min. Rated Capacity[a] Steady-State	E_t 75%
ANSI Z83.8-90	Unit Heaters Gas-Fired	1. Max. Rated Capacity[a] Steady-State	E_t 78%
		2. Min. Rated Capacity[a] Steady-State	E_t 74%
U.L. 731-88	Unit Heaters Oil-Fired	1. Max. Rated Capacity[a] Steady-State	E_t 81%
		2. Min. Rated Capacity[a] Steady-State	E_t 81%

[a] Provided and allowed by the controls.

[b] For detailed references, see ASHRAE Standard 90.1.

[c] E_t = Thermal efficiency, 100%-flue losses. See reference document for detailed definition.

Equipment efficiencies for the following appliances are established under federal Department of Energy rules 10 cfr Part 430 - Energy Conservation Program for Consumer Products and are not contained in this code:

Central air conditioners other than packaged terminal air conditioners which are powered by single phase electric current, air cooled, rated below 65,000 Btu per hour, not contained within the same cabinet as a furnace, the rated capacity of which is above 225,000 Btu per hour, and is a heat pump or a cooling unit only.

Furnaces which utilize only single-phase electric current, or single-phase electric current or DC current in conjunction with natural gas, propane, or home heating oil, and which comply with the following:

(a) Are designed to be the principal heating sources for the living space of a residence;

(b) Are not contained within the same cabinet with a central air conditioner whose rated cooling capacity is above 65,000 Btu per hour;

(c) Are electric central furnaces, electric boilers, forced-air central furnaces; gravity central furnaces, or low pressure steam or hot water boilers, and

(d) Have a heat input rate of less than 300,000 Btu per hour for electric boilers and low pressure steam or hot water boilers and less than 225,000 Btu per hour for forced-air central furnaces, gravity central furnaces, and electric central furnaces, gravity central furnaces, and electric central furnaces.

Heat pumps other then packaged terminal heat pumps which consist of one or more assemblies, powered by single-phase electric current, rated below 65,000 Btu per hour, utilizing an indoor conditioning coil, compressor, and refrigerant-to-outdoor air heat exchanger to provide air heating, and may also provide air cooling, dehumidifying, humidifying circulating, and air cleaning.

Direct heating equipment which is self-contained, and provides heat directly to the space proximate to the heater by gravity or fan circulation without duct connections.

The Department of Energy rules, section 430.31, requires the following efficiencies for heating and cooling equipment and water heaters.

Table A63.20-11
Room Air Conditioners

	Product Class	Energy Efficiency Ratio
1.	Without reverse cycle and with louvered sides less than 6,000 Btu	8.0
2.	Without reverse cycle and with louvered sides 6,000 to 7,999 Btu	8.5
3.	Without reverse cycle and with louvered sides 8,000 to 13,999 Btu	9.0
4.	Without reverse cycle and with louvered sides 14,000 to 19,999 Btu	8.8
5.	Without reverse cycle and with louvered sides 20,000 and more Btu	8.2
6.	Without reverse cycle and without louvered sides less than 6,000 Btu	8.0
7.	Without reverse cycle and without louvered sides 6,000 to 7,999 Btu	8.5
8.	Without reverse cycle and without louvered sides 8,000 to 13,999 Btu	8.5
9.	Without reverse cycle and without louvered sides 14,000 to 19,999 Btu	8.5
10.	Without reverse cycle and without louvered sides 20,000 and more Btu	8.2
11.	With reverse cycle and with louvered sides	8.5
12.	With reverse cycle and without louvered sides	8.0

Table A63.20-12
Central Air Conditioners and
Central Heat Pumps

	Product Class	Seasonal Energy Efficiency Ratio	Heating Seasonal Performance Factor
1.	Split systems	10.0	6.8
2.	Single package systems	9.7	6.6

Table A63.20-13
Water Heaters

Product Class	Energy Factor
1. Gas water heater	0.62-(.0019 x rated storage volume in gallons)
2. Oil water heater	0.59-(.0019 x rated storage volume in gallons)
3. Electric water heater	0.93-(.00132 x rated volume storage in gallons)

Note: Rated storage volume = the water storage capacity of a water heater, in gallons, as specified by the manufacturer.

Table A63.20-14
Furnaces

Product Class	AFUE[1] (percent)
1. Furnaces (excluding classes noted below) (percent)	78
2. Mobile home furnaces (percent)	75
3. Small furnaces (other than furnaces designed solely for installation in mobile homes) having an input rate of less than 45,000 Btu/hr	
(A) Weatherized (outdoor)	78
(B) Nonweatherized (indoor)	78
4. Boilers (excluding gas steam) (percent)	80
5. Gas steam boilers (percent)	75

1 Annual Fuel Utilization Efficiency, as determined in s. 430.22 (n)(2) of the DOE rules.

Table A63.20-15
Direct Heating Equipment

	Product Class	Annual Fuel Utilization Efficiency (percent)
1.	Gas wall fan type up to 42,000 Btu/hour	73
2.	Gas wall fan type over 42,000 Btu/hour	74
3.	Gas wall gravity type up to 10,000 Btu/hour	59
4.	Gas wall gravity type over 10,000 Btu/hour up to 12,000 Btu/hour	60
5.	Gas wall gravity type over 12,000 Btu/hour up to 15,000 Btu/hour	61
6.	Gas wall gravity type over 15,000 Btu/hour up to 19,000 Btu/hour	62
7.	Gas wall gravity type over 19,000 Btu/hour up to 27,000 Btu/hour	63
8.	Gas wall gravity type over 27,000 Btu/hour up to 46,000 Btu/hour	64
9.	Gas wall gravity type over 46,000 Btu/hour	65
10.	Gas floor up to 37,000 Btu/hour	56
11.	Gas floor over 37,000 Btu/hour	57
12.	Gas room up to 18,000 Btu/hour	57
13.	Gas room over 18,000 Btu/hour up to 20,000 Btu/hour	58
14.	Gas room over 20,000 Btu/hour up to 27,000 Btu/hour	63
15.	Gas room over 27,000 Btu/hour up to 46,000 Btu/hour	64
16.	Gas room over 46,000 Btu/hour	65

A-63.29 ALTERNATIVE HVAC PIPING INSULATION TYPES. Insulation thicknesses in Table 63.29-1 are based on insulation with thermal conductivities within the range listed in Table 63.29-1 for each fluid operating temperature range, rated in accordance with ASTM C335-84 at the mean temperature listed in the table. For insulation that has a conductivity outside the range shown in Table 63.29-1 for the applicable fluid operating temperature range at the mean rating temperature shown (when rounded to the nearest 0.01 Btu in./(h °F ft^2)), the minimum thicknesses shall be determined in accordance with the equation given below:

$$T = PR[(1 + t/PR)^{K/k} - 1]$$

where:

T = minimum insulation thickness for material with conductivity K, in.

PR = pipe actual outside radius, in.

t = insulation thickness from Table 63.29-1 in.

K = conductivity of alternate material at the mean rating temperature indicated in Table 63.29-1 for the applicable fluid temperature range, Btu in./(h ft^2 °F)

k = the lower value of the conductivity range listed in Table 63.29-1 for the applicable fluid temperature range, Btu in./(h ft^2 °F)

Table A63.45-1
Typical Lighting Power for Magnetically Ballasted Fluorescent Lamp-Ballast Systems (watts)

	4 Lamps 2 Ballasts		3 Lamps 2 Ballasts		3 Lamps Tandem-Wired Ballasts		2 Lamps 1 Ballast	
	ANSI	Enclosed	ANSI	Enclosed	ANSI	Enclosed	ANSI	Enclosed
Standard Magnetic Energy Saving Ballasts								
31-watt FB31T8			105	97	104	96	69	64
32-watt F32T8	140	129	106	98	105	97	70	65
34-watt F40T12/ES	144	137	112	107	108	103	72	68
40-watt F40T12	176	160	134	121	129	117	88	80
40-watt FB40T12			134	121	129	117	86	78
40-watt F40T5 Twin Tube			130	120			86	79
60-watt F96T12/ES Slimline							123	
75-watt F96T12 Slimline							158	
95-watt F96T12/High Output/ES							199	
110-watt F96T12/High Output/ES							237	

Notes: Data listed are for standard energy efficient magnetic ballasts.
Values listed for 3-lamp systems with 2 magnetic ballasts have 1 single-lamp ballast and 1 double-lamp ballast.

Table A63.45-2
Typical Lighting Power for Electronically Ballasted Rapid-Start Fluorescent Lamp-Ballast Systems

Lamp/Ballast Combination	4 Lamps 1 Ballast		3 Lamps 1 Ballast		2 Lamps 1 Ballast		1 Lamp 1 Ballast	
	ANSI	Enclosed	ANSI	Enclosed	ANSI	Enclosed	ANSI	Enclosed
265 mA T-8 Lamps								
17-watt F17T8					34	33	16	15
25-watt F25T8			66	63	46	44	23	22
32-watt F32T8	120	116	90	87	61	59	31	30
40-watt F40T8			108		73	71	39	
T-12 and T-10 Lamps								
25-watt F30T12/ES			77		49	47	27	25
30-watt F30T12			87		59	57	32	30
34-watt F40T12/ES	117		90	87	62	60	31	30
40-watt F40T10			109	106	73	71	39	38
40-watt F40T12	140		106	103	72	70	38	36
40-watt FB40T12			100	93	67	62		
85-watt F72T12 High Output					164		82	
95-watt F96T12/HO/ES					170			
110-watt F96T12/HO					201			
Twin Tube Biax Lamps								
36-watt FT36T5 Twin Tube			106		72		37	
39-watt FT39T5 Twin Tube			104		70		37	
40-watt FT40T5 Twin Tube				69	67		37	
50-watt FT50T5 Twin Tube			125		106		54	

Notes: Data listed represents averages of rapid-start products available in 1994 from established manufacturers of electronic ballasts.
Actual input wattages for these system may be tuned by using specific products and will differ from these values.
Systems shown have minimum 0.85 ballast factor.

ANSI values listed for flourescent systems assume open air operation of lamps where there is no solid lens between the lamp and the lighted space. Open suspended fixtures and heat extract type recessed troffers will have similar input values.

Input wattage values for enclosed lamps are generally less than they are under ANSI conditions. It is important to note that while input wattage is reduced in enclosed fixtures, so is light output.

Table A63.45-3
Typical Lighting Power for Electronically Ballasted Instant-Start Fluorescent Lamp-Ballast Systems (watts)

Lamp/Ballast Combination	4 Lamps 1 Ballast		3 Lamps 1 Ballast		2 Lamps 1 Ballast		1 Lamp 1 Ballast	
	ANSI	Enclosed	ANSI	Enclosed	ANSI	Enclosed	ANSI	Enclosed
265 mA T-8 Lamps								
17-watt F17T8	62	60	50	49	34	32	18	17
25-watt F25T8	87	85	68	67	48	46	28	27
31-watt FB31T8			88	79	61	55	31	30
32-watt F32T8	110	104	89	88	61	57	33	31
36-watt F36T8	150		112		78			
55-watt F96T8					110			
T-12 Slimline Lamps								
55-watt F72T12					109			
60-watt F96T12 Slimline/ES					110		72	
75-watt F96T12 Slimline					135		85	
Twin Tube Biax Lamps								
39-watt FT39T5					64		42	
40-watt FT40T5			103		72		43	
55-watt FT55T5 Twin Tube						115		

Notes: Data listed represents averages of rapid-start products available in 1994 from established manufacturers of electronic ballasts. Actual input wattages for these system may be tuned by using specific products and will differ from these values. Systems shown have minimum 0.85 ballast factor.

Table A63.45-4
Typical Lighting Power for Electronically Ballasted Low-Wattage Reduced-Output Fluorescent Lamp-Ballast Systems (watts)

Lamp/Ballast Combination	4 Lamps 1 Ballast		3 Lamps 1 Ballast		2 Lamps 1 Ballast		1 Lamp 1 Ballast	
	ANSI Watts	Ballast Factor	ANSI Watts	Ballast Factor	ANSI Watts	Ballast Factor	ANSI Watts	Ballast Factor
17-watt F17T8	54(RS)	0.77			27(RS)	0.77	14(RS)	0.77
25-watt F25T8	80(IS)	0.82			41(RS)	0.77	21(RS)	0.77
	79(RS)	0.77						
32-watt F32T8	99(IS)	0.79	79(IS)	0.82	54(IS)	0.82	28(RS)	0.77
	101(RS)	0.77	78(RS)	0.75	55(RS)	0.79		
34-watt F40T12/ES	117	0.83	85	0.83	61	0.83	31	0.82
39-watt F39T5 Twin Tube			73(IS)	0.63	52(IS)	0.64		
40-watt F40T5 Twin Tube					60(RS)	0.7		
40-watt F40T8			69(IS)	0.8	66(IS)	0.82		
					69(RS)	0.80		
40-watt F40T12			85	0	61	0.73	57	
40-watt F40T10					72	0.84	37	0.84
59-watt F96T8					105	0.83		
85-watt F72T12/HO					160	0.80		
110-watt F96T12						190	0.8	

Notes: All systems with ballast factor of <0.85
RS = rapid start operation
IS = instant start operation
Ballast factor listed is typical for the average input wattage given for all available products. Note that reducing the ballast factor decreases light output in addition to reducing input wattage.

Table 63.45-5
Typical Lighting Power for Compact Fluorescent Lamps

Lamp Type	Ballast Type	Input Watts
5-watt Twin Tube	Reactor preheat	9
7-watt Twin Tube	Reactor preheat	11
9-watt Twin Tube	Reactor preheat	13
13-watt Twin Tube	Reactor preheat	17
9-watt Quad Tube	Reactor preheat	13
13-watt Quad Tube	Reactor preheat	17
10-watt Quad Tube	Autotransformer preheat	16
	Reactor preheat	13
13-watt Quad Tube	Autotransformer preheat	18
	Reactor preheat	16
15-watt Quad Tube	Reactor preheat	20
18-watt Quad Tube	Autotransformer preheat	25
	Reactor preheat	22
18-20-watt Twin Tube	370 mA preheat or rapid start	22
18-watt Twin Tube	270 MA rapid start	23
	265 mA electronic IS	17
20-watt Quad Tube	Reactor preheat	27
24-27-watt Twin Tube	340 mA rapid start	32
	265 mA electronic IS	21
26-watt Quad Tube	Autotransformer preheat	37
	Reactor preheat HPF	33
	Electronic HPF	23
27-watt Quad Tube	Reactor preheat	34

Table A63.45-6
Typical Lighting Power for High-Intensity Discharge Lamps

Lamp Watts	Ballast Watts	Fixture Input Watts
Mercury Vapor Lamps		
75	15	90
100	18	118
175	25	200
250	35	285
400	50	450
1,000	75	1,075
Metal Halide Lamps		
32	6	38
50	13	63
70	18	88
100	25	125
175	35	210
250	42	292
400	55	455
1,000	70	1,070
High Pressure Sodium Lamps		
35	8	43
50	13	63
70	18	88
100	30	130
150	38	188
250	50	300
400	65	465
1,000	90	1,090

Notes: Source: Pacific Gas & Electric
Figures listed represent average values taken from Osram-Sylvania, Philips, and General Electric lamp catalogs.

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Safety & Buildings Division has issued a "Commercial Building Energy Conservation/HVAC Code Handbook" for use in compliance with Comm 63 & 64 of the Wisconsin Commercial Building Code. Please refer to the Supplementary publications order form found in the front of the Code Commentary if ordering.

Subchapter I -- Scope

COMM 64.01 SCOPE.

(1) GENERAL. All heating, ventilating and air conditioning systems shall be designed, installed, maintained and operated so as to provide the service and results required within the provisions of this chapter. The minimum requirements established in each part of this chapter shall be complied with as they apply to that specific public building or place of employment. The administrative rules pertaining to energy conservation may be applied retroactively to existing buildings.

Scope: *A building not previously heated or a building that is not required to be heated, such as a warehouse, but is now to be heated, would have to comply with the energy requirements of COMM 63 and the requirements of this chapter.*

(2) ADDITIONS. The provisions of this chapter shall apply to additions to existing buildings and structures as specified in s. COMM 50.03. When an existing HVAC system is extended to serve an addition, existing system components are not required to be replaced if the requirements of this chapter are met within the addition.

(3) ALTERATIONS.

(a) The provisions of this chapter shall apply to remodeling or alterations in any building or structure which affect the replacement of major equipment as specified in s. COMM 50.03.

(b)When an existing HVAC system serves a remodeled or altered space that has not undergone a change in occupancy or use, the existing system components are not required to be replaced if the requirements of this chapter that applied to the original construction of the space are met.

Note: "Occupancy or use" refers to the entries in Table 64.05.

Note: Compliance with this code shall not constitute assurance of proper installation or operation of the heating, ventilating and air conditioning system. This code is not to be used as a design manual, but it is established as a minimum standard for safety, health and general welfare of the public.

The prevailing code applies to the replacement of major heating equipment including, but not limited to, furnaces, air handling units, boilers, and water heaters. This would include the requirement for the preparation of plans so as to submit and gain approval. The Safety and Buildings Division has developed a process by which, when a narrow set of criteria are met, a letter can be submitted for approval, in lieu of plans.

Boiler, Furnace, Or Central Air Conditioner Replacement. *Replacement of equipment means no changes to existing ductwork or piping are permitted other than those necessary to fit the new equipment to the existing system. If changes to the ductwork and piping go beyond this, HVAC*

alteration plans must be submitted in accordance with COMM 50.12. Replacement does not cover increasing equipment sizes or capacities to accommodate building alterations or additions.

When a replacement of boiler or furnace is made (unless the new equipment is electric, direct –vent sealed combustion chamber appliance, or suspended if permitted), a fire resistive rated enclosure is required to exist.

The existing "furnace room" need only be in compliance with the code that was in effect at the time of the last approval. Following are some of the older enclosure requirements.

1. *Buildings constructed prior to 1914 require a two-hour floor, one-hour walls and ceiling.*
2. *Buildings constructed during 1914 through 1930 do not require a rated enclosure for a low pressure boiler. Furnaces and other hazards require a one-hour enclosure.*
3. *Buildings constructed after 1930 but before April 1, 1997:*
   ***Chapter 54 Buildings**: 2 hour fire-resistive enclosure, except buildings not more than 2 stories in height and having a floor area of not more than 3,000 square feet per floor required a 1-hour fire- resistive enclosure.*
   ***Chapter 55 Buildings**: 3 hour fire-resistive enclosure, except that assembly halls accommodating not more than 300 person require, a 2-hour fire-resistive*
   ***Chapter 56 Buildings**: 4 hour fire-resistive enclosure except one-story buildings required a 2-hour fire-resistive enclosure.*
   ***Chapter 57 Buildings:** 2 hour fire-resistive rated enclosure except buildings less than 3 stories in height required a one-hour fire-resistive rated enclosure.*
   ***Chapter 58 Buildings**: 3-hour fire-resistive rated enclosure except buildings less than 3 stories in height required a 2-hour fire-resistive rated enclosure.*
   ***Chapter 59 Buildings**: 2-hour fire-resistive enclosure.*
   ***Chapter 60 Buildings**: 2 hour fire-resistive rated enclosure except buildings less than 3 stories in height required a one-hour fire-resistive rated enclosure.*
   ***Chapter 62 Open Parking Structures:** 2-hour fire-resistive.*
   ***Chapter 62 Assembly Seating Facilities:**, 2-hour fire-resistive enclosure*
   ***Chapter 62 Greenhouse** 2-hour fire-resistive enclosure except buildings which are not more than 2 stories in height and which have a floor area of not more than 3,000 square feet per floor, required a 1-hour fire resistive.*
4. *Buildings constructed after April 1, 1997 require an enclosure in accordance with present code.*

The following information must be submitted and approved prior to the replacement of the equipment:

a. A completed SBD-118 plan review application form. Call (608) 266-3151 if a form is needed.

b. A fee of $80.00 per building.

c. At least four copies of a letter. The letter shall: identify the building by address, occupancy, and owner; identify the name and address of the HVAC contractor or designer responsible for making the replacement; give the make, model and BTU output of the equipment being replaced; give the make, model and BTU output of the replacement equipment. . UL, AGA, PFS or other recognized laboratory approval shall be specified

d. If the BTU output of the replacement equipment is less than that of the equipment being replaced, HVAC heat loss calculations must be submitted proving the adequacy and code compliance of the smaller unit(s).

e. If the replacement equipment has a BTU output less than that of the equipment being replaced and the building contains more than 50,000 cubic feet total volume, the letters and heat loss calculations must be signed, sealed, and dated by a Wisconsin registered architect, engineer, or HVAC designer. (Involvement of a registered professional is not required if the capacity of the replacement equipment equals or exceeds that of the replaced equipment.)

f. If the new equipment is such that it will require fire rated isolation from the balance of the building where the old equipment did not, evidence of a rated enclosure must be submitted with the application. Typical examples of this type of replacement include changing from electric to gas-fired and from direct-vent sealed combustion chamber gas-fired to traditional gas-fired. Evidence of rated enclosure consists of a letter from an architect, engineer, or certified commercial building inspector stating that an existing rated room is present and giving the fire rating of that room in hours. If the room is not adequate, submission must include the building of a new rated room, per COMM 50.12.

COMM 64.02 APPROVAL OF DRAWINGS AND SPECIFICATIONS.

All drawings and specifications shall be submitted to the department in accordance with the provisions of ss. COMM 50.07 and 50.12.

Approval Of Drawings And Specifications. *HVAC plans will not be reviewed unless the building plans, if required, have been previously approved.*

The energy conservation code became effective in July of 1978. Since that time, the addition of air-cooling equipment to an approved heating system requires departmental approval of energy conservation provisions. A letter showing compliance with the equipment efficiencies of Chapter 63 will satisfy this requirement.

COMM 64.025 DEFINITIONS.

In this chapter:

(1) **"Air change"** means the introduction of new, cleansed, or recirculated air to a space.

The phrase "Air movement" used in several areas of this chapter is taken to mean the same as "Air change".

The energy conservation code became effective in July of 1978. Since that time, the addition of air-cooling equipment to an approved heating system requires departmental approval of energy conservation provisions. A letter showing compliance with the equipment efficiencies of Chapter 63 will satisfy this requirement.

(1m)"Air change rate" means airflow in volume units per hour divided by the building space volume in identical volume units.

(2) "Air conditioning" means the process of treating air to control temperature or humidity and distributing to meet the requirements of the conditioned space.

(3) "Exhaust vent" means a vent, including a relief vent, through which air is exhausted from a space to the atmosphere.

(4) "Exhaust ventilating system" means any combination of building construction, machinery, devices or equipment, designed and operated to remove gases, dusts, fumes or vitiated air from the breathing zone of employees and frequenters.

(5) "**Gravity exhaust ventilation**" means a process of removing air by natural means, the effectiveness depending on atmospheric condition, such as difference in relative density, difference in temperature or wind motion.

(6) "**Mechanical ventilation**" means the process of supplying a mixture of tempered outside air or simultaneously removing contaminated air to the outside by power-driven fans or blowers or both.

(7) "**Outside air**" means air that is taken from outside the building and is free from contamination of any kind in proportions detrimental to the health or comfort of the general population exposed to it.

(8) "**Recirculated air**" means the transfer of air from a space through the air-handling equipment and back to the space.

(9) "**Spot heating**" means to provide heat to raise the air temperature to the required minimum in the immediate area of the occupants.

(10) "**Tempered air**" means air transferred from a heated or cooled area of a building.

(11) "**Tempered outside air**" means outside air heated or cooled before distribution.

(12) "**Ventilation**" means the process of supplying or removing air by natural or mechanical means, to or from any space.

Subchapter II -- Design and Operation Requirements

COMM 64.03 DESIGN.

(1) **BUILDING HEAT LOSS.** The total building heat loss shall be equal to the sum of the building transmission losses and infiltration or the building transmission losses and ventilation losses, whichever sum is greater.

(2) **HEATING SYSTEM DESIGN.** The primary heating system intended to maintain the inside design temperature of s. COMM 64.05 (1) shall be designed to equalize building transmission losses and infiltration or ventilation losses during occupied periods. Credit will be given for internal heat gains against the total design loss of the heating system, provided the heat gains are demonstrated by the designer.

(3) **CAPACITY AND ARRANGEMENT.** The calculated capacity and the arrangement of all installations for required heating and ventilating shall be based upon simultaneous service to all parts of the building unless otherwise exempted by this code.

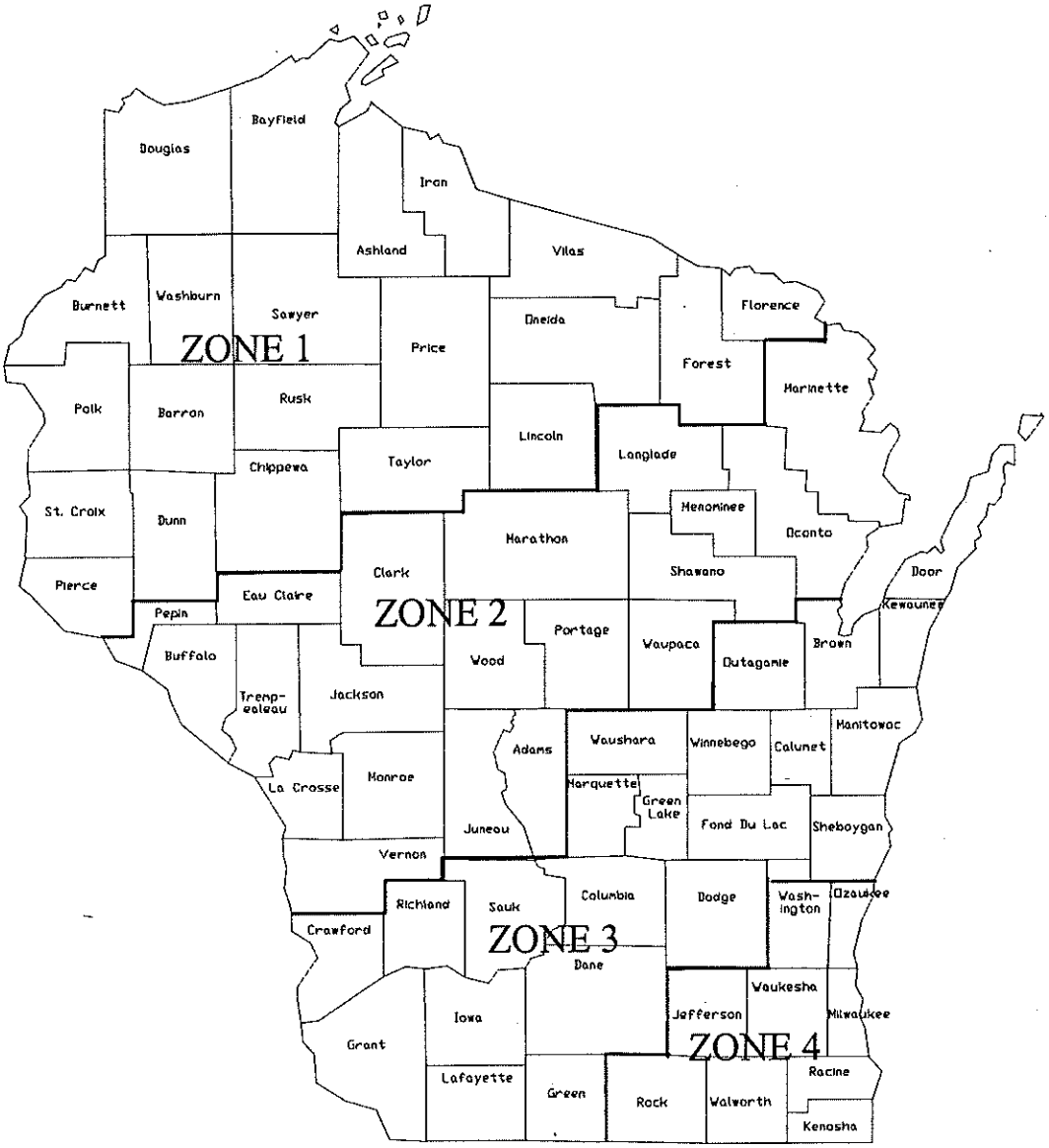
Design. *COMM 51.01 (88) Indicates a space must be occupied by people in order to demand the requirements for an "occupied" space. Heat and/or ventilation is only required when the space is occupied. Per sections COMM 64.08(3) & 64.65(4), required exhaust systems, depending on the space and occupancy being exhausted, may need to operate either continuously or when any part of the building is occupied , not just when the space served is occupied.*

COMM 64.04 OUTSIDE TEMPERATURE DESIGN CONDITIONS.

Outside design temperatures shall be taken from either Figure 63.23 or ASHRAE 90.1.

Outside Temperature Design Conditions. *The design heat loss is based on the outdoor temperature indicated on the zone map. Should the outdoor temperature be lower than the design temperature, it is feasible that the equipment used in the original HVAC design will not have the capacity to maintain the required minimum inside temperature. This does not relieve the owner of the responsibility of maintaining the required minimum inside temperature indicated in COMM 64.05.*

MAP OF WISCONSIN SHOWING DESIGN TEMPERATURE ZONES



Zone 1 . . . . . -25° below zero F

Zone 2 . . . . . -20° below zero F

Zone 3. . . . . -15° below zero F

Zone 4 . . . . . -10° below zero F

COMM 64.05 INSIDE DESIGN TEMPERATURES AND VENTILATION REQUIREMENTS.

(1) INSIDE DESIGN TEMPERATURES.

(a) *Heating system design.* The heating system shall be designed to maintain a temperature of not less than that shown in Table 64.05 and must be operated at not less than that temperature during occupied periods.

(b) *Spot heating.* Spot heating may be used to heat individual fixed work stations in large industrial buildings where it is impractical to provide heat to the entire space as described in par. (a), provided the inside design temperature at the fixed work station is at least 60°F.

(2) VENTILATION REQUIREMENTS. The ventilating system shall be designed, maintained and operated to accomplish the required minimum ventilation indicated in Table 64.05. The required ventilation for areas of each occupancy or use is specified by the ventilation classification assigned to each occupancy or use in Table 64.05. Areas of different ventilation classification shall be provided with a complete solid separation or the most stringent ventilation requirement shall apply to all unseparated areas.

Different ventilation classifications must be separated by solid partitions or the most restrictive requirements shall be provided.

(a) Areas assigned ventilation classification (a) shall be provided with a supply of outside air and an equal amount of exhaust ventilation at a rate of 7.5 cubic feet per minute per person within the area served by the system and with a minimum air change rate as specified in s. COMM 64.06 (2).

(b) Areas assigned ventilation classification (b) shall be provided with a supply of outside air and an equal amount of exhaust ventilation at a rate of 7.5 cubic feet per minute per person within the area served by the system and with a minimum air change rate as specified in s. COMM 64.06 (2), or shall be provided with a percentage of openings in accordance with sub. (3).

(c) Areas assigned ventilation classification (c) shall be provided with a supply of outside air and exhaust ventilation determined using the cfm per square foot of net floor area specified in Table 64.05.

(d) Areas assigned ventilation classification (d) shall be provided with an amount of exhaust ventilation determined using the cfm per square foot of net floor area specified in Table 64.05. The area shall be provided with negative pressure relative to adjacent areas. An equal supply of outside air is required when the exhaust exceeds 1/2 air change per hour in the area served by the exhaust unless otherwise exempted under sub. (4).

***Question**: This note specifies that a toilet room be provided with negative pressure relative to adjacent areas. May supply air be provided in a toilet room?*

***Answer:** Yes, however the toilet room must be maintained under negative pressure as required by the code. The supply air must be interlocked so that supply air is only provided when the exhaust is running. Supply air is not allowed in toilet rooms with only ductless fans. See also COMM 64.65*

(e) Areas assigned ventilation classification (e) shall be provided with a percentage of outside openings in accordance with sub. (3).

(f) Corridor areas in shopping malls assigned ventilation classification (f) do not require a separate supply of outside air provided the outside air introduced in the store areas adjacent to the mall is circulated through and exhausted from the shopping mall corridor area.

(3) PERCENT OF OPENINGS. Where the required ventilation is provided with a percent of openings, the net openable area of exterior windows and doors in each room shall be at least equal to the specified percent of the floor area of that room. Separate mechanical ventilation systems shall be provided for rooms with less than the required percent of openings.

This section refers to only those occupancies where fumes and/or other contaminants are not present. A garage or welding shop would not qualify.

The required percent openables is specified in Table 64.05.

(4) EXCEPTIONS.

(a) *Outside air requirement waived.* If a mechanical air supply system is provided and the requirement for outdoor air determined in accordance with Table 64.05 is less than 5% of the minimum required air changes per hour determined in accordance with s. COMM 64.06 (2), the requirement for outside air may be eliminated.

(b) *Outside air requirement and percent of openings waived.* The requirement for outside air or percent of openings specified in Table 64.05 may be omitted for (a) or (b) ventilation classifications in large volume spaces containing 5,000 or more cubic feet per occupant.

(5) DETERMINATION OF NUMBER OF PERSONS. The number of persons in a given space shall be calculated using the net square feet per person given in Table 64.05 unless justification acceptable to the department is provided to show that a different number of occupants is reasonable. When the number of persons is not derived from Table 64.05, the number of occupants shall be documented. Where there is no value indicated for the net square feet per person in Table 64.05, the actual number of occupants shall be used to determine the required amount of outside air.

*Net Square Feet Per Person, as used in COMM Table 64.05, refers to the entire area of a room or space minus any permanent components such as structural columns or vertical ducts. Do **NOT** deduct areas of cabinets, shelves, desks and other movable equipment.*

TABLE 64.05
TEMPERATURE AND VENTILATION TABLE

Use or Occupancy[6]	Minimum Inside Temperature (Degrees F)	Ventilation Requirements[1]					Applicable Occupancy Code Section (COMM Number)
		Ventilation Classification	Basis of Capacity				
			O.A. - Mech. Net Sq. Ft. Per Person	O.A. - Nat. Percent of Openings 2	Exhaust CFM/Net Square Feet Floor Area	Air Change Rate[9] Minimum Air Change Per Hour With A/C	
Factories, office and mercantile buildings							
Animal kennels	NMR	(d)	—	—	Note 3	—	64.54
Barber and beauty salons	67	(d)	—	—	0.50	—	64.54, 64.18
Canning factories	60	(b)	75	3	—	—	64.54, 64.68
Conference rooms	67	(a)	7	—	—	3	64.54
Court and jury rooms	67	(b)	6	3	—	3	64.54
Factories and machine shops	60	(b)	75	3	—	—	64.54
Flammable liquids storage	NMR	(d)	—	—	—	—	64.18, COMM 10
Foundries and boiler shops	50	(b)	75	3	—	—	64.13, 64.54
Funeral homes:							
Chapel	67	(b)	6	3	—	—	64.54
Embalming room	67	(d)	—	—	2.00	—	64.54
Offices	67	(a)	75	—	—	1.5	64.54
Places of worship, entertainment and recreation which accommodates less than 100 persons	†	(b)	—	3	†	—	64.54
Printing establishments	60	(a) or (d)	75	—	Note 8	3	64.18, 64.54
Retail establishments	67	(b)	60	3	—	1.0	64.54

TABLE 64.05 (CONTINUED)

Use or Occupancy[6]	Minimum Inside Temperature (Degrees F)	Ventilation Requirements[1]					Applicable Occupancy Code Section (COMM Number)
		Ventilation Classification	Basis of Capacity				
			O.A. - Mech. Net Sq. Ft. Per Person	O.A - Nat. Percent of Openings [2]	Exhaust CFM/Net Square Feet Floor Area	Air Change Rate[9] Minimum Air Change Per Hour With A/C	
Shopping mall corridor areas (except mercantile areas)	NMR	(f)	Aggregate capacity of stores served by mall	---	---	---	64.54
Security vaults (occupied)	67	(a)	300	---	---	---	64.54
Warehouses	NMR	---	---	---	---	---	64.18, 64.54
Dark room	67	(d)	---	---	2.00	---	64.54, 64.18
Smoking lounge	67	(d)	---	---	2.00	---	64.54, 64.18
Dry cleaners	67	(d)	---	---	2.00	---	64.54, 64.18 ch. COMM 15
Theaters and places of assembly (which accommodate more than 100 persons)							
Arenas and field houses (use seated area)	60	(a)	6	---	---	2	64.55
Armory drill floors	55	(a)	30	---	---	---	64.55
Assembly halls (other than church)	67	(a)	6	---	---	2	64.55
Bowling alleys	67	(a)	15	---	---	2	Based on occupied areas
Cafeterias, dining areas, restaurants, billiard rooms	67	(a)	15	---	---	2	64.55

TABLE 64.05 (CONTINUED)

Use or Occupancy[6]	Minimum Inside Temperature (Degrees F)	Ventilation Requirements[1]					Applicable Occupancy Code Section (COMM Number)
			Basis of Capacity				
		Ventilation Classification	O.A. - Mech. Net Sq. Ft. Per Person	O.A - Nat. Percent of Openings 2	Exhaust CFM/Net Square Feet Floor Area	Air Change Rate[9] Minimum Air Change Per Hour With A/C	
Places of worship:							
Chapels	67	(b)	6	3	---	---	64.55 (3)
Dining and social rooms	67	(b)	15	3	---	---	64.55 (3)
Nave or auditorium	67	(b)	6	3	---	---	64.55 (3)
Class rooms	67	(b)	20	3	---	---	64.55 (3)
Dance halls	67	(a)	15	---	---	2	64.55
Ice skating rinks (indoor)	NMR	(a)	15	---	---	---	64.55
Ice resurfacing (indoor)	NMR	(d)	---	---	---	---	64.18, 64.55
Lodge halls, club rooms	67	(a)	15	---	---	2	64.55
Roller skating rinks (indoor)	50	(a)	15	---	---	2	64.55
Bars and cocktail lounges	67	(d)	---	---	0.50	---	64.55
Tennis courts (indoor)	60	(a)	---	---	---	---	64.55
Theaters (seated area)	67	(a)	6	---	---	2	64.55
Lobbies	67	(a)	15	---	---	---	64.55
Lounge rooms	67	(a)	15	---	---	---	64.55
Motion picture booths	60	(a) or (c)	---	---	2.00	---	64.55
Smoking lounge	67	(d)	---	---	2.00	---	64.55, 64.18
Game rooms	67	(a)	15	---	---	2	64.55

TABLE 64.05 (CONTINUED)

Use or Occupancy[6]	Minimum Inside Temperature (Degrees F)	Ventilation Requirements[1]					Applicable Occupancy Code Section (COMM Number)
		Ventilation Classification	Basis of Capacity				
			O.A. - Mech. Net Sq. Ft. Per Person	O.A - Nat. Percent of Openings [2]	Exhaust CFM/Net Square Feet Floor Area	Air Change Rate[9] Minimum Air Change Per Hour With A/C	
Gambling casinos	67	(a)	15	---	---	2	64.55
Health care facilities					See s. COMM 64.57		
Schools or other places of instruction							
Administrative office space	67	(a)	75	---	---	1.5	64.56
Arts, crafts	67	(a)	30	---	---	2	64.56
Classrooms	67	(a)	20	---	---	2	64.56
Gymnasiums, field houses, auditoriums, theaters (fixed seats)	67	(a)	6	---	---	2	64.56
Bleachers	---	(a)	2.75 or 18"/person	---	---	2	64.56
Locker and shower rooms	70	(d)	---	---	2 or 35 cfm per locker	---	64.56
Gymnasiums, field houses, auditoriums, theaters (nonseated areas)	67	(a)	75	---	---	2	64.56
Home economics	67	(a)	30	---	---	2	64.56
(cooking)	67	(d)	---	---	Note 5	---	64.67
Laboratories (science)	67	(a)	30	---	---	2	64.18

TABLE 64.05 (CONTINUED)

Use or Occupancy[6]	Minimum Inside Temperature (Degrees F)	Ventilation Requirements[1]					Applicable Occupancy Code Section (COMM Number)
		Ventilation Classification	Basis of Capacity				
			O.A. - Mech. Net Sq. Ft. Per Person	O.A - Nat. Percent of Openings 2	Exhaust CFM/Net Square Feet Floor Area	Air Change Rate[9] Minimum Air Change Per Hour With A/C	
Lecture halls	67	(a)	6	—	—	2	64.56
Corridors with lockers	67	(a)	—	—	—	10 cfm/lineal ft. of length	64.56
Library and resource centers	67	(a)	20	—	—	2	64.56
Reading rooms	67	(a)	20	—	—	2	64.56
Stack areas	67	(d)	—	—	0.25	—	64.56
Lunchrooms	67	(a)	10	—	—	1	64.56
Museums and art galleries	67	(a)	40	—	—	2	64.56
Music rooms (instrumental)	67	(a)	20	—	—	2	64.56
(vocal)	67	(a)	10	—	—	2	64.56
Special education	67	(a)	35	—	—	2	64.56
Study halls, common areas with nonfixed seating	67	(a)	10	—	—	2	64.56
Toilet rooms	67	(d)		—	Greatest of 2 or 75 cfm/TF	—	64.54
Vocational shops:							
With vehicle service and repair	60	(d)	—	—	0.75	—	64.18
Without vehicle service and repair	60	(a)	50	—	—	2	64.18

TABLE 64.05 (CONTINUED)

Use or Occupancy[6]	Minimum Inside Temperature (Degrees F)	Ventilation Requirements[1]					Applicable Occupancy Code Section (COMM Number)
		Ventilation Classification	Basis of Capacity				
			O.A. - Mech. Net Sq. Ft. Per Person	O.A - Nat. Percent of Openings 2	Exhaust CFM/Net Square Feet Floor Area	Air Change Rate[9] Minimum Air Change Per Hour With A/C	
Wardrobes, coat rooms	NMR	(d)	---	---	2.00	---	64.65
Detention facilities							
Sleeping rooms (note 7)	67	(b)	35	4	---	---	64.58
Residential occupancies							
Living and sleeping areas	67	(b)	Note 4	4	---	---	64.59
Day care facilities	67	(a)	35	---	---	2	64.60
Garages and service stations							
Automobile showrooms:							
Less than 6 vehicles	60	(b)	75	3	---	---	64.64
6 or more vehicles	60	(d)	---	---	0.50	---	64.64
New vehicles only	60	(a)	75	---	---	1	64.64

TABLE 64.05 (CONTINUED)

Use or Occupancy[6]	Minimum Inside Temperature (Degrees F)	Ventilation Requirements[1]						Applicable Occupancy Code Section (COMM Number)
		Ventilation Classification	Basis of Capacity					
			O.A. - Mech. Net Sq. Ft. Per Person	O.A - Nat. Percent of Openings 2	Exhaust CFM/Net Square Feet Floor Area	Air Change Rate[9] Minimum Air Change Per Hour With A/C		
Garages: less than 6 vehicles	NMR	(b)	---	3	---	---		64.63
Garages: 6 or more vehicles	NMR	(d)	---	---	0.50	---		64.63
Repair areas	60	(d)	---	---	0.75	---		64.61
Vehicle service buildings	60	(d)	---	---	0.50	---		64.62, 59.17
General sanitation and service areas								
Chlorine storage rooms	NMR	(d)	---	---	2.00	---		64.65
Janitor closets	NMR	(d)	---	---	2 or 50/sink	---		64.65
Locker rooms and shower rooms	70	(d)	---	---	2 or 35/locker	---		64.65
Toilet rooms	67	(d)	---	---	2 or 75/TF	---		64.65
Toilet rooms (with outdoor stadium)	50	(d)	---	---	2 or 75/TF	---		64.65
Coat rooms (walk in)	60	(d)	---	---	2.00	---		64.65
Locker and changing rooms with toxic contamination	70	(c)	---	---	2 or 35/locker	---		64.65, 64.54 & 54.13

TABLE 64.05 (CONTINUED)

Use or Occupancy[6]	Minimum Inside Temperature (Degrees F)	Ventilation Requirements[1]					Applicable Occupancy Code Section (COMM Number)
		Ventilation Classification	Basis of Capacity				
			O.A. - Mech. Net Sq. Ft. Per Person	O.A. - Nat. Percent of Openings 2	Exhaust CFM/Net Square Feet Floor Area	Air Change Rate[9] Minimum Air Change Per Hour With A/C	
Changing rooms without toxic contamination	70	(b)	15	3	0.50	1	64.65
Laundries ;(commercial)	60	(d)	---	---	2.00	---	64.65
Natatoriums	76	(d)	---	---	2/pool sf	---	64.66
Kitchens	60	(d)	---	---	2.00	---	64.67
Seasonal occupancies							
Camps and lodges:							
Dining and recreational areas	NMR	(b)	15	3	---	---	64.68
Living and sleeping areas	NMR	(e)	---	4	---	---	64.68
Club houses	NMR	(b)	15	3	---	---	64.68
Drive-ins	NMR	(b)	15	3	---	---	64.68
Kitchens	NMR	(c) or (d)	---	---	2.00	---	64.67
Outdoor toilets	NMR	(d)	---	---	2.00	---	52.53 & 64.65

CFM = Cubic feet per minute
LF = Lineal foot
NMR = No minimum requirement

TF = Toilet fixtures (water closets and urinals)

A/C = Air conditioning

† See theaters and places of assembly for inside design temperature and cfm per net square feet floor area.

1 See ss. COMM 64.06, 64.07 and 64.08 for mechanical, natural and exhaust ventilation systems; and ss. COMM 64.11 to 64.18 for ventilation air standards.

2 See s. COMM 64.07 for special considerations on natural ventilation.

3 Temperature, humidity and air flow for animal kennels will depend on animal type.

4 30 cfm of outside air shall be provided for each room. All other requirements for the (b) ventilation classification remain the same.

Residential occupancies require either 4% openable areas in each living and sleeping area; or if this cannot be met, 30 cfm of outside air shall be provided to each living or sleeping room that fails to meet the 4% openable requirement.

5 200 cfm of exhaust ventilation per cooking appliance shall be provided. All other requirements for the (d) ventilation classification remain the same.

6 This Table is intended as a reference guide with generic Use types listed under those Occupancy types most often associated with the Use. When Use types are mixed between Occupancy types and the Use type is unlisted within the specific Occupancy Type, the use shall be ventilated as required by the same Use type listed in the other Occupancy type. Unlisted occupancies or uses shall be ventilated as required for the most similar listed occupancy or use acceptable to the department. Rooms that are used for different purposes at different times shall be designed for the greatest amount of ventilation required for any of the uses.

A rated separation is not required in order to have different ventilation rates or types.

7 See ss. COMM 58.45(2) & 58.46(2) for more stringent requirements which may exist. When unseparated toilet fixtures are included in sleeping areas (such as cells), the room shall be ventilated as required for Toilet rooms.

8 In instances where the printing process involve inks or solvents which are volatile or otherwise toxic to humans, the (d) ventilation classification shall be used the exhaust rate shall not be less than 2 cfm/square foot of floor area.

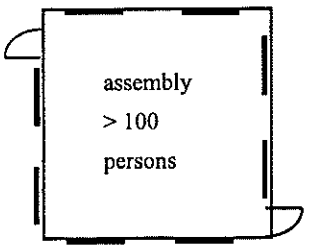
9 See s. COMM 64.06 for specific requirements and exceptions which may exist. The minimum air change rate is 6 air changes per hour. The air change rates shown in the table are the rates permitted when air conditioning is provided in accordance with s. COMM 63.23 and the heat gain requirement for the space has been satisfied.

Coin operated Laundromats are considered retail establishments and are not required to exhaust air at a rate of 2 cfm/sq.ft. The listed exhaust rate for laundries (commercial) in Table 64.05 refers to commercial laundries where there are multiple workers in a specific location.

EXAMPLES OF VENTILATION SYSTEMS ARE SHOWN IN FIGURE 1.

Figure 1

(a) ventilation

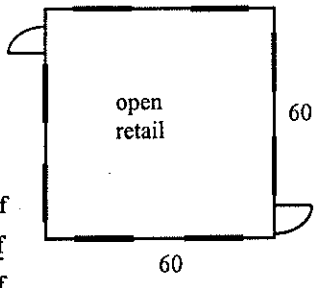


7.5 cfm/person outside air ♦ exhaust
air change of 6 air changes/hour unless air conditioned

(b) ventilation

windows
10 sf
each

windows 80 sf
doors 40 sf
120 sf

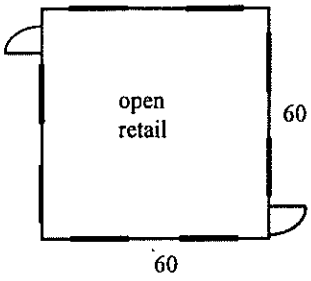


3% openable =0.03 x 3600 = 108 sf,
meets % openable.

(b) ventilation

windows
5 sf
each

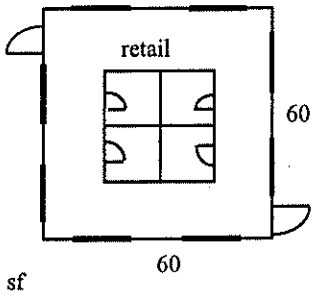
windows 40 sf
doors 40 sf
80 sf



3% openable = 0.03 x 3600 = 108 sf
does not meet % openable, provide outside air

(b) ventilation of interior rooms

windows
10 sf
each
openable



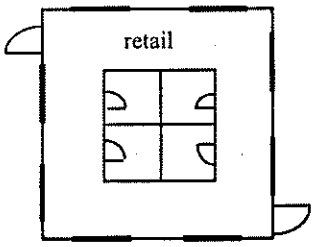
windows 80 sf
doors 40 sf
120 sf

3% openable = 0.03 x 3600 = 108 sf
meets 3% openable, but interior rooms do not

(b) ventilation, interior room

COMM 64.05 (4)(a), ventilation < 5% of 6 air changes/hour

Table 1
64.05

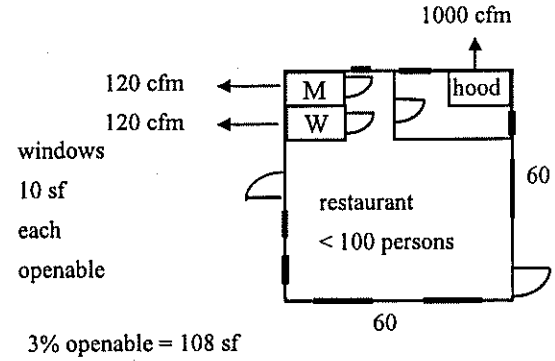


provide
6 air changes / hour

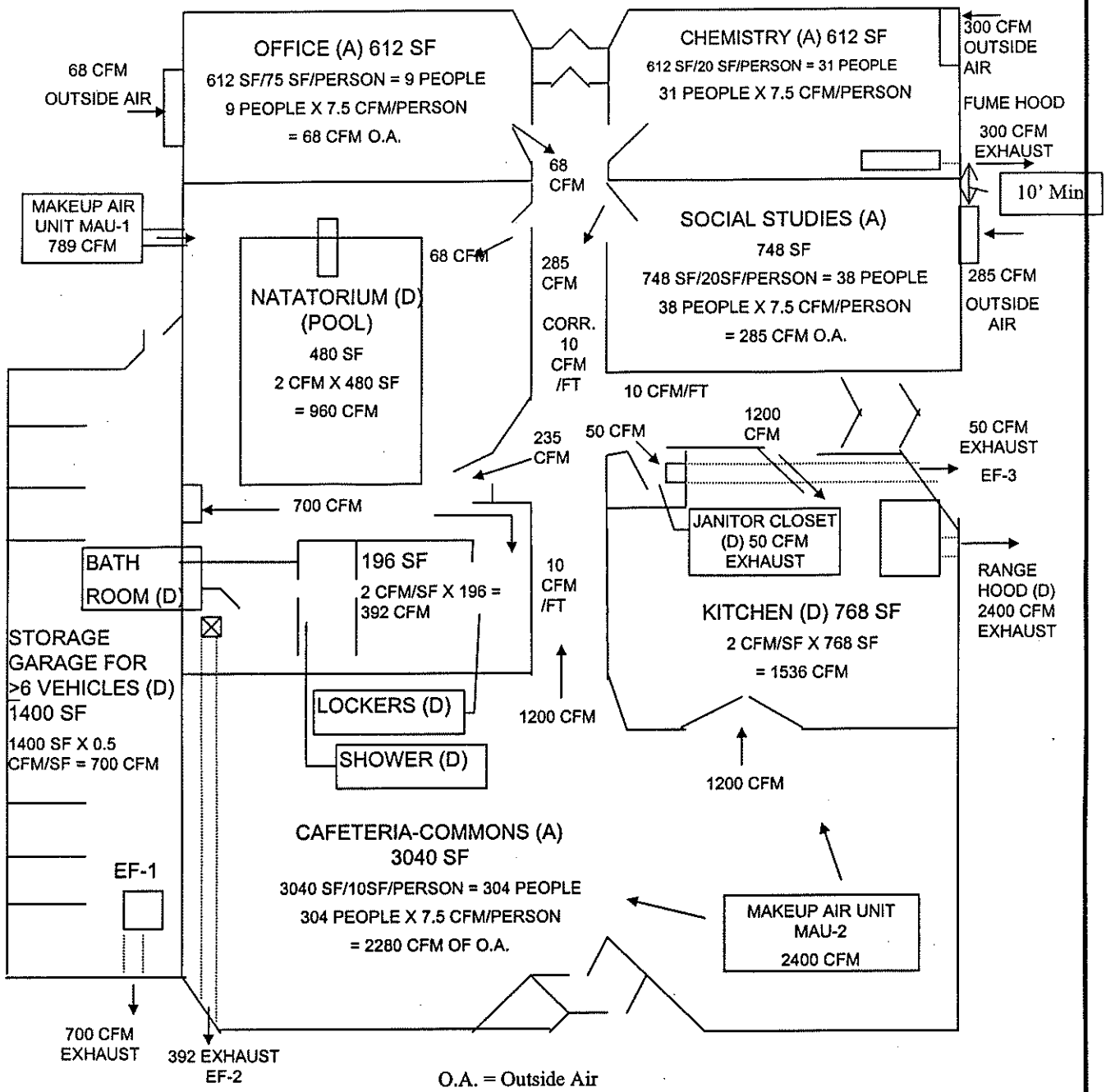
retail 144 sf, 8 ft ceiling
6 a.c. = (144 x 8 x 6)/60 = 115 cfm
5% of 115 = 5.8 cfm
5.8 > 5.0 cfm/person
(144/75 sq ft per person) x 7.5 cfm = 15 cfm
5.8 < 15 cfm, therefore exception may not be used

(b) ventilation

% openable, but exhaust exceeds 1/2 air change per hour, provide outside air (10 ft ceiling)



3% openable = 108 sf
120 sf > 108 sf
1/2 a.c. = (3600 x 10)/2 = 18,000 ft^3/hr =
300 cfm -- exhaust exceeds 1/2 a.c./hour



O.A. = Outside Air

ACH = Air Change per Hour

Continued on following page

CONTROLS : MAU-1 Interlocked with EF-1; MAU-2 Interlocked with Range Hood

Note: 1) If Fume Hood is not running, 300 CFM slightly pressurizes building. (See COMM 64.40)

2) EF-2 & 3 must operate while the building is occupied.

3) MAU-2 could have two position O.A. dampers: 2,400 CFM; and 2,280 CFM with 120 CFM of Return Air always totaling 2,400 CFM Supply Air.

4) Although not shown, the lockers in the corridor are 150 ft in length which requires 1500 of air passing through the corridor (10 CFM/lineal foot of locker). There is air transfer from the office, cafeteria-commons and the the social studies room to the toilests, janitor closet, natatorium and kitchen for a total of 1553 CFM of air into and out of the corridor.

Transfer of Air Flow (A) or (B) Ventilation Classification to (C), (D), or (E) Classification

	OUTSIDE AIR		EXHAUST
Chemistry	300 cfm	Fume Hood	300 cfm
Social Studies	285 cfm	Janitor Closet	50 cfm
Cafeteria	2,400 cfm	Kitchen Hood	2,400 cfm
Natatorium	789 cfm	Toilets	392 cfm
Office	68 cfm	Garage	700 cfm
TOTAL	**3,842 cfm**		**3,842 cfm**

Transfer Air: Lockers (150 lineal feet) 1500cfm Required transfer air in corridors; 1553 cfm actual (see note 4 above)

COMM 64.06 MECHANICAL VENTILATION SYSTEMS.

(1) OUTSIDE AIR. Mechanical ventilation systems shall be operated to provide a continuous source of outside air to all areas while people are present. The minimum amount of outside air supplied to the system shall be determined in accordance with s. COMM 64.05. Exhaust ventilation in equal volume shall be maintained simultaneously.

Note: When less than one occupant per 5000 cubic feet is present, operation of the ventilation system may be modified as specified in s. COMM 64.05 (4).

(2) AIR CHANGE. Air change shall be provided while people are present. The air-change rate may be based on actual room height or up to 10 feet from the floor level of the room in question. The volume above 10 feet, in rooms which are more than 10 feet in height, need not be considered in the air change requirement if the required air change is designed to occur in the lower 10 feet of the occupied space. Where more than one room is served by a common supply system, the required minimum air change volume shall be transferred through the air handling equipment where it is diluted or replaced with outside air, and supplied back to the space. Where a supply system serves only one room, the required minimum air change may be achieved by circulation within the room at the required rate.

(a) *Six air changes per hour.* When required for (a) and (b) ventilation classifications, as specified in s. COMM 64.05, the total air change rate shall be at least 6 air changes per hour.

(b) *Less than 6 air changes per hour.* An air change rate of less than 6 air changes per hour will be permitted where mechanical cooling (air conditioning) is provided in accordance with s. COMM 63.23 (2), and the heat gain requirement for the space has been satisfied. The air change rate may not be less than the minimum air changes per hour if specified in Table 64.05.

The previous passage does not allow the required outdoor air to be reduced.

Note: The amount of outside air required by s. COMM 64.05 must be maintained even if the air change rate is reduced.

(c) *Air change requirement waived.* The air change requirement for 6 air changes per hour may be omitted in the following applications:

1. Spot heating.
2. Buildings where the requirement for outside air is waived in accordance with s. COMM 64.05 (4)(b).
3. Buildings utilizing percentage of openings as specified in s. COMM 64.05.

(3) AIR DISTRIBUTION. An adequate number of air supply, return and exhaust outlets or grilles shall be provided to insure a uniform distribution of air.

(4) RECIRCULATION AND TRANSFER OF AIR.

(a) *Recirculation.* No air contaminated by any source other than human occupancy shall be recirculated, except within the same ventilation classification as assigned in s. COMM 64.05.

(b) *Transfer.* Air in a volume equal to the outside air required for a room may be transferred through a corridor and exhausted through a locker room, toilet room, kitchen, janitor closet or a similar area. Air shall not be transferred through elevator shafts and stairwells where doors are required at any floor level.

The department will accept the practice of undercutting nonfire-rated doors as a means to transfer air.

(5) DIVERSIFIED MECHANICAL SYSTEMS. If the mechanical ventilation system is able to deliver required quantities of outside air to each area when required, the department will recognize diversity and the system may be designed on the actual capacity.

Design: *Mechanical ventilation systems shall be designed to supply a continuous source of outside air to all areas while people are present. Exhaust ventilation in equal volume shall be maintained simultaneously.*

Where more than one room is served by a common supply system, the required minimum air change volume shall be transferred through the air handling equipment where it is diluted or

replaced with outside air and supplied back to the space. Ceiling fans may not be used for accomplishing air change in this situation.

Where a supply system serves only one room, the required minimum air change may be achieved by circulation within the room at the required rate. Ceiling fans may be used only in this situation to achieve the minimum air change requirement.

Note #1: The outdoor air amounts specified in this section assume that the dominant source of indoor air contamination is human occupancy. Where other indoor contaminants or sources are present, source control or other control or removal strategies may be needed.

Note #2: See ch. COMM 32, Safety & Health Standards for Public Employees, for requirements for dust, fumes, vapors and gases.

COMM 64.07 NATURAL VENTILATION SYSTEM.

(1) **OUTDOOR OPENINGS.** Outdoor openings used for natural ventilation shall be within 100 feet, or 5 times the least dimensional width of the occupied area, whichever is the least.

Question: *Where openable windows are required, must storm windows also be openable if they are provided?*

Answer: *Yes. Openable windows are utilized to provide required natural ventilation to the occupants of the room. Even though infiltration may provide some outdoor air, the volume of air needed is not adequately provided unless the storm windows are also equipped with hardware which would allow the window to be opened if desired by the building occupant.*

(a) *Outdoor openings located below grade.* Outdoor openings below grade will not be accepted unless there is a clear space outside of the opening having a width not less than 1 1/2 times the distance below grade at the bottom of the opening.

Note: Width of clear space is the horizontal distance measured at right angles to the plane of the opening.

(b) *Outdoor openings located from a property line.* Outdoor openings shall be at least 5 feet from a property line or lot line or both or an adjacent building on the same property. This distance restriction does not apply to property lines along streets.

Note: For further restrictions, see Table 51.03-B and s. COMM 64.19.

(2) **VESTIBULE OPENINGS.** Vestibule type openings may be used to satisfy the requirements specified in sub. (1) only for the areas of the building into which the vestibule opens and which are not separated from the vestibule by an additional door.

A hall which connects an interior room with an outside door, as shown in Figure 3, is not considered as a vestibule opening.

Vestibule type openings may be used to satisfy the requirements specified in sub. (1) only for the areas into which the vestibule opens ***and which are not separated from the vestibule by an additional door.***

FIGURES 3, 4, and 5 ARE EXAMPLES OF HOW NATURAL VENTILATION IS APPLIED

Figure 3a

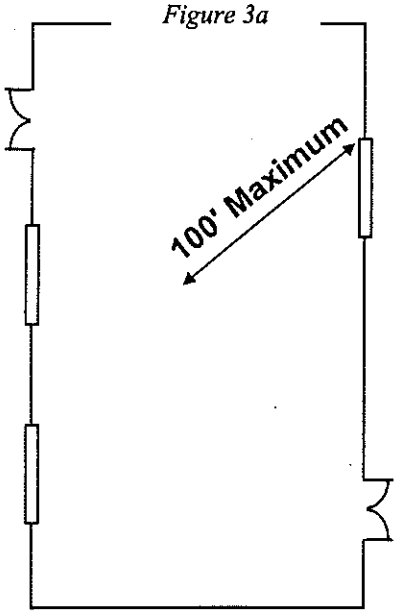
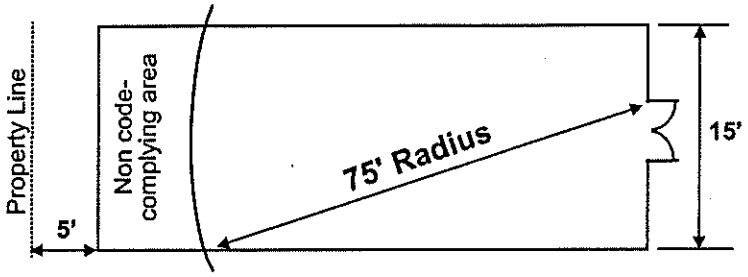


Figure 3b



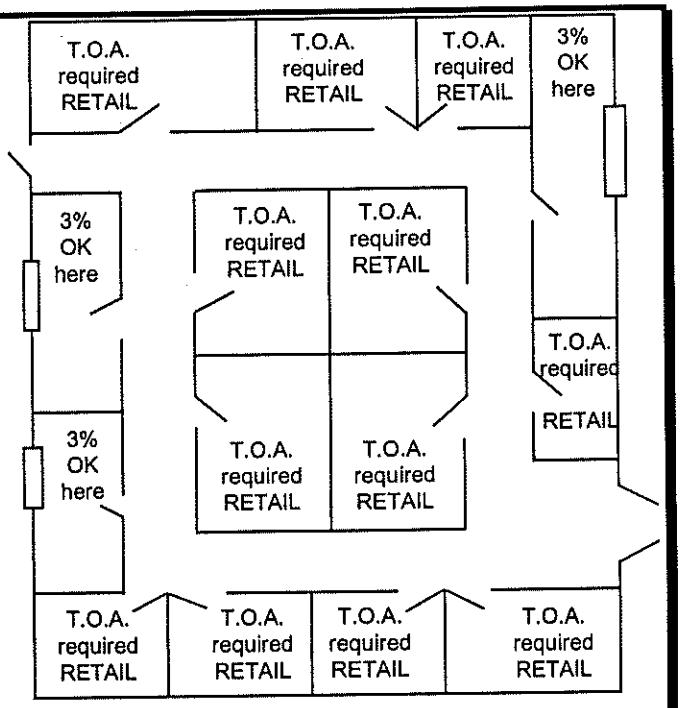
Outdoor openings used for natural ventilation shall be within 100 feet, or 5 times the least dimensional width of the occupied area, whichever is the least. Outdoor openings shall be at least 5 feet from property line or adjacent building on the same property. This does not apply to a property line along streets and alleys. See COMM 64.07 (1) and 64.07 (1)(b).

In Figure 3a, all occupied areas are within 100 feet of an outside opening. The least dimensional width is greater than 25 feet (5 times 25 is 125 feet) and therefore natural ventilation (outside opening) shall be within 100 feet of an occupied area. In Figure 3b, 5 times the least dimensional width of the occupied area is 75 feet (5 times 15 feet wide). All occupied areas are not within 75 of an outside opening. Figure 3b does not comply with the requirements of 64.07 (1).

Figure 4 shows a building with ceiling to floor partitions which divide the building into small retail spaces.

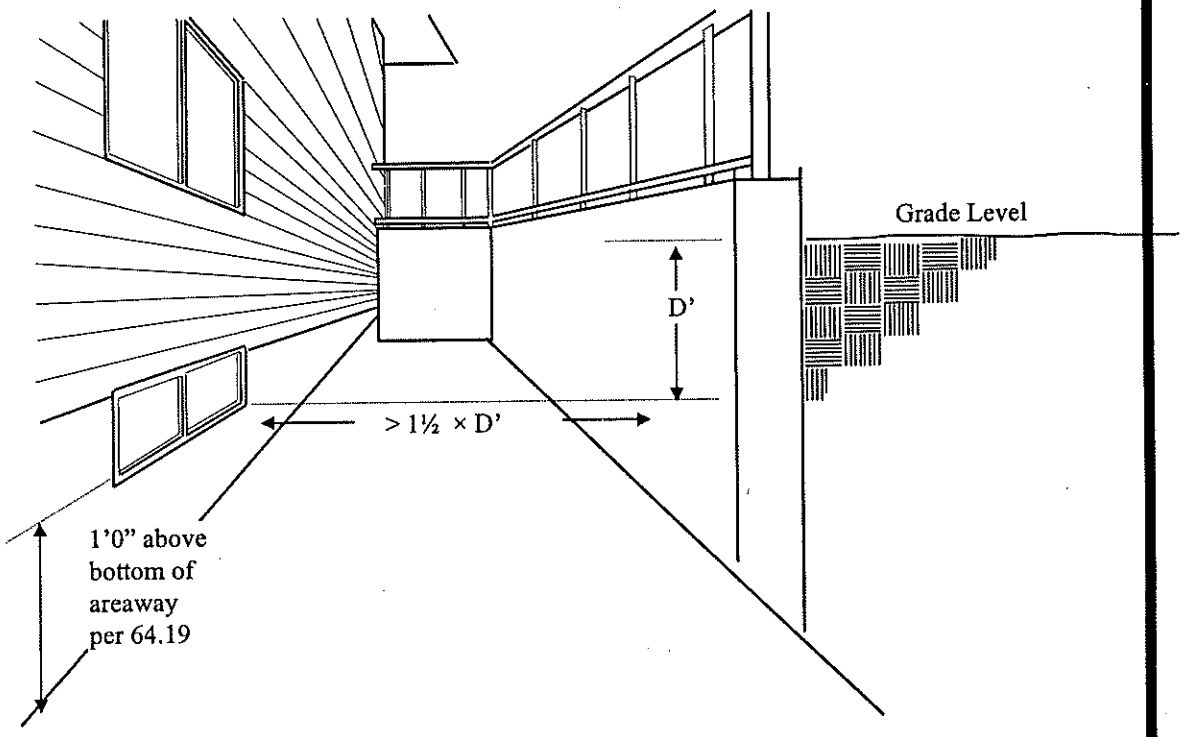
Rooms without openable doors or windows require tempered outside air (T.O.A.) with exhaust equal to the tempered air supplied.

A hall which connects an interior room with an outside door as shown in Figure 4, is not considered a vestibule opening. Vestibule type openings may be used to satisfy the requirements specified in 64.07 (1) only for the areas into which the vestibule opens and which are not separated from the vestibule by an additional door.



Outdoor openings below grade require a clear space outside the opening 1½ times the distance below grade of the opening. Where railings are provided in lieu of protective grates, see the requirements for guardrails under COMM 51.162. See Figure 5 below.

Figure 5



COMM 64.08 EXHAUST VENTILATION SYSTEM.

(1) DEFINITIONS.

(a) *Exhaust ventilating system.* Any combination of building construction, machinery, devices or equipment, designed and operated to remove harmful gases, dusts, fumes or vitiated air from the breathing zone of employees and frequenters.

(b) *Gravity exhaust ventilation.* A process of removing air by natural means, the effectiveness depending on atmospheric condition, such as difference in relative density, difference in temperature or wind motion.

(2) DESIGN.

(a) Exhaust ventilating systems shall be designed to reasonably prevent contaminated air from reentering the building.

(b) Mechanical exhaust ventilation shall be used when exhaust ventilation is required for toilet rooms, repair areas and garages except that gravity exhaust ventilation may be used for unoccupied, detached garages for long-term storage only.

(3) OPERATION. The required building exhaust ventilating systems shall operate continuously when people are in the building to provide the amount of exhaust specified in Table 64.05.

This section indicates that required building exhaust ventilating systems must operate continuously during periods of occupancy. Occupied means "while people are present." Buildings used exclusively for storage garage purposes may have the ventilation system shut down during periods of time when there are no people present. However, garages built in conjunction with other uses, such as apartment building garages, may not be shut down as the building is always occupied, unless an exception listed in COMM 64.63(2) is met. Note that the exception still requires that negative pressure be maintained at all times relative to the adjacent areas. Also see commentary note under 64.65(4).

If an electrical designer elects to use the exception found in NEC 511, then the exhaust ventilating system may not be shut off at any time; this includes times when people are <u>not</u> in the building.

Note: Continuous operation of some exhaust systems, such as purging systems, chloride storage exhaust, or industrial exhaust, may be necessary. See ch. COMM 32, Safety & Health Standards for Public Employees.

(4) EXHAUST VENTS. All exhaust vents shall be ducted to the exterior of the building.

*Exhausts **shall not** terminate in an attic space, crawl space, soffit or similar areas. These spaces are considered part of the building.*

Clothes dryers are required to be vented to the exterior and meet the requirements of 64.34. Specifically, if the duct is nonmetallic, then the requirements of COMM 64.34(3) must be met.

The manufacturers listing requirements may be stricter, and if so, shall also be met. In general, many of the listings require that the duct be metallic, and that the duct be rigid if concealed.

(5) GRAVITY SIPHON-TYPE ROOF VENTILATORS.

(a) Except as provided in par. (b), gravity siphon-type roof ventilators shall be sized to provide a free area so that the velocity of the air does not exceed 300 feet per minute.

(b) The allowable velocity specified in par. (a) may be increased to 600 feet per minute provided the outside air is supplied by mechanical means.

Note: Heat reclaim equipment for exhaust systems having more than 10,000 CFM capacity should be considered for energy savings.

COMM 64.09 COMBUSTION AIR INTAKES.

Any room in which fuel-burning equipment, including water heaters, fireplaces and process equipment, is located shall be supplied with combustion air for safe operation. When new heating equipment is installed in existing buildings, combustion air shall be provided in accordance with this section unless another method is shown to be adequate.

(1) COMBUSTION AIR. Combustion air shall be provided by one of the following methods:

Combustion air for fireplaces and process equipment is frequently overlooked.

(a) *Combustion air by gravitational means.* Where combustion air is introduced by gravitational means, the minimum free area for combustion air intakes shall be calculated in square inches as indicated in Table 64.09. The values for gas- and oil-fired equipment are based on the fuel input of the equipment. The value for solid-fuel equipment and fireplaces is based on the fuel input of the equipment, the area of the chimney connector or the listing for the specific piece of equipment. (See Table 64.09).

TABLE 64.09

Combustion Air Intake Areas

Atmospheric Combustion	Combustion Air Intakes Ducted from the Outside to an Interior Room or Fireplace	Combustion Air Intakes Located at the Outside Wall of an Exterior Room
Gas-fired, all occupancies except industrial	1 sq. in./1000 Btu/hr.	1 sq. in./2000 Btu/hr.
Gas-fired, industrial occupancies	1 sq. in./1000 Btu/hr.	1 sq. in./5000 Btu/hr.
Oil-fired, all occupancies	1 sq. in./1000 Btu/hr.	1 sq. in./2000 Btu/hr.
Solid-fuel fired equipment and fireplaces, all occupancies	1 sq. in./1000 Btu/hr. for furnace type units. 1/2 of the chimney connector area for free-standing and fireplace type units. In accordance with equipment listing, if listing includes combustion air provisions.	

Combustion air shall not be taken from an attic or interior part of the building. Combustion air shall be taken from outside the building.

(b) *Combustion air for power burners.* The free area for combustion air intakes for power burners, including forced draft and induced draft systems, shall be at least 0.5 square feet per 1,000,000 Btu per hour fuel input, with a minimum free area of 10 square inches.

(c) *Combustion air by mechanical means.* Combustion air furnished by mechanical systems, such as makeup air units, may be used when complete design data is submitted and approved by the department.

Combustion air supplied by mechanical means require that combustion air calculations be submitted for review. The department will accept calculations showing 20 percent excess air where the CFM is equal to the input heating capacity expressed in 1,000 BTU per hour divided by 5. (CFM = MBH/5.)

(d) *Combustion air by infiltration.* If the heating equipment is not required to be located in a fire-resistive room, combustion air may be provided by means of infiltration where the total area of outdoor openings is greater than 3% of the floor area in which the equipment is located, and where 150% of the air required for theoretical complete combustion is no greater than 1/4 air change per hour.

Note: See s. COMM 64.22 for special conditions.

Combustion Air By Infiltration. *If the heating equipment is not required to be located in a fire-resistive room, combustion air may be provided by means of infiltration where the total area of* ***outdoor*** *openings is greater than 3% of the floor area in which the equipment is located,* ***and*** *where 150% of the air required for theoretical complete combustion is not greater than 1/4 air change per hour. The latter calculation may be verified by using the procedure where the volume is equal to or greater than the total burner input, in BTU per hour, divided by 18. (Prior to April 1, 1997, combustion air requirements could be satisfied by meeting one of the two requirements)*

(2) DAMPERS.

(a) Manually operated dampers are prohibited in combustion air intakes, except for manually fired solid-fuel fired equipment, where the combustion air is connected directly to the equipment.

(b) A motorized damper or fire damper shall be permitted in combustion air intake if a means is provided to ensure that the damper is open before the burner is in operation.

(3) DUCTWORK. Where ductwork is required to bring combustion air into the building, the duct shall have the same cross-sectional area as the free area of the combustion air openings.

(4) SEGREGATION OF COMBUSTION AIR. The combustion air path shall be completely segregated from the outside air ventilation ductwork.

(5) NEGATIVE PRESSURE LOCATIONS. Atmospheric combustion shall be prohibited in a space under negative pressure.

(6) MOUNTING HEIGHT. Mounting height of the combustion air intakes shall be as required in s. COMM 64.19 (1) (c).

(7) AIR-HANDLING EQUIPMENT LOCATED IN A BOILER OR FURNACE ROOM. If the fuel input rating of the fuel burning equipment exceeds 400,000 Btu per hour, the air-handling equipment and the fuel-burning equipment shall be interlocked to shut off the fuel-burning equipment and the air-handling equipment when any service door of the air-handling equipment is opened, unless an air barrier separation is provided between the fuel-burning equipment and the air-handling equipment.

COMM 64.10 REFRIGERANTS.

The rules covering the use of refrigerants for air conditioning systems shall conform with ch. COMM 45, Mechanical Refrigeration.

Subchapter III -- Ventilation and Air Standards

COMM 64.11 VENTILATION AND AIR STANDARDS.

The quantity of air used to ventilate a given space during periods of occupancy shall always be sufficient to maintain the standards of air distribution, air movement, recirculation, ss. COMM 64.13 to 64.19.

COMM 64.13 TEMPERED AIR REQUIREMENTS.

(1) SUPPLY AIR. The design conditions of the supply air temperature to the occupied space shall be between 50°F. and 140°F.

(2) TEMPERED AIR SUPPLY DEPENDING ON NEGATIVE PRESSURE. A supply of tempered air, depending on a negative pressure within the space, will be permitted in foundries, steel fabricating shops and similar areas.

Untempered outside air is permitted in buildings with high ceilings where it can be shown that the outside air when mixed with room air has a minimum temperature of 50°F. before coming in contact with occupants. Where a space does not require tempered air, such as a warehouse, but heat is provided to temper the space, the air temperature requirement may be reduced to the temperature of the space.

COMM 64.14 TEMPERED OUTSIDE AIR REQUIREMENTS.

(1) MAKE-UP AIR. A supply of tempered outside air shall be provided when the total volume of exhaust exceeds 1/2 air change per hour in the area served by the exhaust.

Note: See ch. COMM 32, Safety and Health Standards for Public Employees, for further requirements for makeup air for industrial exhaust systems.

Overhead garage doors may not be utilized for make-up air required by this section.

Tempered outside air requirements. Make-up air--the statement says that make-up air shall be supplied when the total building exhaust exceeds 1/2 air change per hour. The ventilation

requirements of COMM 64.05 (1), Table 1, apply regardless of how much air is being exhausted. Where ventilation classifications (b) and (f) systems are allowed, less than 1/2 air change building exhaust may be offset by infiltration where natural ventilation is permissible.

Question: *Is tempering of make-up air required for the exhaust amounts utilized in an engineered smoke control system?*

Answer: *Tempering of make-up air is required to eliminate the introduction of cold air and drafts into areas normally considered occupied.*

The exhaust and supply air amounts, generated in an engineered smoke control system, are specifically designed to operate when a fire/smoke emergency arises. In that mode, the primary purpose of the ventilation is to isolate/remove the smoke generated during a fire. In essence, that purpose is a life safety issue, which must take precedence over an occupant comfort requirement.

The NFPA Standards (NFPA 90A and NFPA 92A) for such a system only reference the consideration to temper "the incoming air and avoid or limit damage" to building systems in cold climates. Such consideration would not require tempering to 50°.

Thus, make-up air/supply air for an engineered smoke control system need not be provided except as necessary for the operation of the system.

The make-up air need not be tempered to the minimum 50°F temperatures. The designer is required only to consider the effects of the entering air on the building systems and to preheat air only if necessary.

(2) PROCESS HEAT. Process heat may be used to temper required outside air.

COMM 64.15 AIR MOVEMENT AND DISTRIBUTION.

The air delivery capacity of all equipment supplying air for heating, ventilating and air conditioning purposes shall be based on standard air ratings.

Note: Standard air is substantially equivalent to dry air at 70°F. and 29.92 inches (Hg) barometric pressure.

COMM 64.16 AIR-CLEANSING DEVICES.

(1) AIR-CLEANSING ACCESS. Air-cleansing devices shall be designed and installed to permit access to the equipment for maintenance and to insure proper operation of the heating and ventilating system.

(2) AIR-CLEANSING FILTERS. Approved air-cleansing filters shall be designed and installed in a manner to filter the outside air and recirculated air used with mechanical heating and ventilating systems except as follows:

(a) Filters are not required in garages, factories, foundries and similar occupancies;

(b) Filters are not required for use with unit heaters designed for heating and recirculation; or

(c) Where jet systems or blend-air systems are approved, air filters are not required in the ducts that are installed for the recirculation of air within the same occupied space.

Note: The department recognizes as approved, filters listed in the Building Materials List published by Underwriters Laboratories, Inc., and test data of any other recognized testing agency for the purpose for which it is used.

(3) AIR-CLEANSING MATERIALS. Contaminated water shall not be used or recirculated through sprays affecting air used for ventilating purposes.

COMM 64.17 CONTROLS.

(1) GENERAL. Except as provided in sub. (2), automatic controls shall be provided to maintain design temperature, control ventilation to provide a continuous air movement of not less than the minimum required by this chapter, and to provide a continuous supply of outside air, make-up air and exhaust determined by the provisions of s. COMM 64.05, when occupied.

This section requires a continuous supply of tempered outside air during occupied periods. Unoccupied buildings as mentioned in COMM 64.03 do not require ventilation. A storage garage, if a separate building and unoccupied, does not require ventilation.

(2) EXCEPTION. Manual control of solid-fuel fired equipment to maintain inside design temperature is permitted.

COMM 64.18 CONTAMINATION OF AIR.

(1) CONTAMINATION. Air contaminated from odors, fumes, noxious gases, smoke, steam, dust, spray, or other contamination shall be diluted with uncontaminated air or exhausted to prevent the contaminated air from spreading to other parts of the building occupied by people.

Additional ventilation or process exhaust beyond the general building ventilation required under Comm 64.05 (2) is required whenever industrial or other contaminants threaten to exceed the threshold limit values (TLVs). Note that the department recognizes tobacco smoke as a contaminant. Reference should be made to the following as guidelines.

Comm 10	*FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE*
Comm 14	*FIRE PREVENTION*
Comm 15	*CLEANING AND DYEING*
Comm 32	*INDUSTRIAL VENTILATION MANUAL SAFETY AND HEALTH STANDARDS FOR PUBLIC EMPLOYEES*
Comm 45	*MECHANICAL REFRIGERATION*

Question: *Must an elevator equipment room be ventilated?*

Answer: *COMM 18.20 [A17.1-101.5b] of the elevator code requires natural or mechanical ventilation when excess heat is produced so as to avoid overheating of the elevator equipment and to ensure safe operation of the elevator. In addition, it has been determined that the hydraulic fluid odor "contaminates" the air per COMM 64.18(1). When dealing with the transfer of air, the thought that "air shall not be transferred from an area of greater contamination" further clarifies the basic design concept that air not be circulated from dirty to clean (see COMM 64.06). Air movement should always be from clean to dirty, and "cross" circulation should be avoided. A designer is to be reminded that when the elevator equipment room requires a rating, fire dampers may be required at all penetrations to the fire resistive*

rated separation (see COMM 64.42) and that fire labeled doors cannot be field modified so any door grills must be part of the tested labeled door. Lastly, exhaust air from the area must be ducted to the exterior of the building.

Note: For requirements pertaining to all places of employment or occupancy where smoke, gas, dust, fumes, steam, vapor, industrial poisons, or other detrimental materials are used, stored, handled, or are present in the air in sufficient quantities to obstruct the vision, or to be injurious to the health, safety or welfare of the employees or frequenters, see ch. COMM 32, Safety and Health Standards for Public Employees.

(a) *Chlorinated hydrocarbons.* Areas where chlorinated hydrocarbons are introduced shall be arranged to satisfy the following conditions:

Note: Some of the chlorinated hydrocarbons commonly used are: trichloroethylene, perchloroethylene, carbon tetrochloride, methylene chloride, methyl chloroform, Freon F-11, Freon F-12, Freon F-21 and Freon F-114. For example, these materials are used in dry cleaning establishments, in degreasing operations, and where pressure can propellants are used. Pressure cans are used for such products as enamels, lacquers, paint removers, stencil inks, lubricants, pesticides, hair sprays, shaving lathers, shampoos and colognes.

1. The area shall have an exhaust system capable of maintaining a negative pressure within the enclosed area.

2. The volume and distribution of air movement within the area shall be such that the average threshold limit values of specific airborne contaminants are not exceeded.

Note: See ch. COMM 32, Safety and Health Standards for Public Employees.

3. No fuel-fired heating unit, with or without a heat exchanger, shall be located within this area, nor shall it recirculate air from this area.

4. The surface temperatures of any type of heating equipment used in these areas shall be below the temperature at which toxic materials may be released.

Note: Toxic materials are those covered in ch. COMM 32, Safety and Health Standards for Public Employees.

(b) *Transfer of contaminated air.* Air shall not be transferred from an area of greater contamination.

Note: The department will accept air transferred from: corridor to toilet room; corridor to cloak room or janitor closet; dining room to kitchen; locker room to toilet room; gymnasium to locker room; showroom to garage; and corridor to school vocational shops.

Required locker rooms in factories require outside air as per COMM 64.54 (4).

(c) Transfer of air between dwelling units. Air shall not be transferred from one dwelling unit to another, except in buildings where tobacco smoking is controlled and restricted to designated areas and not allowed in dwelling units, and air is not transferred from designated smoking areas to dwelling units.

The exception allowing the transfer of air from one dwelling unit to another is for community-based residential facilities (CBRF's), hospitals, and nursing homes where there is absolute control of tobacco smoke.

(2) BATTERY CHARGING AREAS. Battery charging areas shall be provided with 3/4 cfm per square foot of outside air and equivalent exhaust unless calculations are submitted to verify that the concentration of hydrogen generated during battery charging will be

maintained below 1.5% by volume by other means. Exhaust air shall be drawn from the battery charging area at ceiling height.

COMM 64.19 LOCATION OF OUTSIDE VENTILATING AIR INTAKES OR EXHAUSTS FOR MECHANICAL VENTILATION SYSTEMS.

(1) LOCATION AND DISTANCE.

(a) *Location to prevent contamination.* Outside air intake openings for ventilation, doors, and openable windows shall be located to minimize contamination of outdoor air and shall be at least 10 feet, measured in any direction, from outlets that emit products of combustion and exhaust vents. Exceptions to this paragraph are given in subds. 1. to 4.

1. Exhaust vents of 100 cfm or less shall be located at least 12 inches, measured in any direction, from doors or openable windows.

2. Paragraph (a) does not apply to intakes for combustion air or short-cycle hoods.

3. The 10-foot minimum separation of par. (a) does not apply to the intake and exhaust of a factory-packaged rooftop unit provided nothing restricts air flow around the unit. The exhaust and intake of the unit shall be located to minimize contamination of outside air.

4. Product of combustion outlets of direct vent sealed combustion chamber appliance vents shall be located at least 12 inches, measured in any direction, from doors or openable windows.

Note 1: See s. COMM 82.31(16) for plumbing vent setbacks. That rule requires plumbing vents to be 10 feet from air intakes and 10 feet horizontally from or 2 feet above roof scuttles, doors or openable windows.

Note 2: See NFPA 45, Standard on Fire Protection for Laboratories using Chemicals, adopted under Ch. COMM 10, for chemical fume hood exhaust location. Health care facilities may have additional requirements, see s. COMM 64.57.

(b) *Distance to adjacent properties.* Air intakes and exhausts shall be at least 10 feet from a property line or lot line or both or an adjacent building on the same property. This distance restriction does not apply to property lines along streets or alleys.

Care should be taken to locate fresh air intakes an adequate distance from vehicle exhaust when the intake is near, adjacent, or directly from an alley, parking lot, loading dock area, etc.

(c) *Mounting height.* The lowest side of outside air intake openings shall be located at least 12 inches above outside grade, above adjoining roof surfaces, or above the bottom of an areaway.

Note: The department will accept outside air intakes in areaways provided the minimum horizontal cross section of the areaway is equal to the free area of the opening, a grating is provided over the areaway with a free area equal to the required air intake, and the grating is designed for a minimum of 100 PSF live load. A guardrail, as defined in s. COMM 51.162, will be accepted in lieu of the grating.

(2) SCREENS. All outside air intake openings shall be provided with a device to prevent intake of foreign material of 1/2 inch size or larger.

(3) WEATHER PROTECTION. All outside air intake openings shall be protected against weather and water with a weatherproof hood or louvers.

(4) ACCESSIBILITY AND CLEANLINESS. All outside air intakes shall be easily accessible for cleaning and shall be kept clean and sanitary.

(5) DAMPERS.

(a) *Intake.* All required outside air intakes serving tempered or heated spaces shall be equipped with a damper with automatic controls which will close the damper and prevent the intake of outside air into the building when the ventilating unit is not in operation. Barometric controls shall not be used for the damper.

(b) *Exhaust.* Exhaust openings serving tempered or heated spaces shall be provided with automatic or self-activating back-draft dampers to prevent the intake of outside air into the building when the exhaust units are not in operation. Commercial kitchen hood systems are exempt from this paragraph.

Note: See s. COMM 64.57 for additional requirements for the location of intakes and exhausts for hospitals and nursing homes. See the Administrative Plumbing Code, chs. COMM 81-86 for additional clearance requirements for plumbing vents.

Subchapter IV -- Heating Equipment Requirements

COMM 64.20 EQUIPMENT RATINGS AND SAFETY CONTROLS.

(1) TEST AND INSTALLATION STANDARDS. All oil- and gas-fired heating equipment, electric heating equipment, solid-fuel heating equipment and accessory equipment or devices shall be tested and installed in accordance with standards recognized by the department. Department review and approval of input or output ratings or both are required when ratings are needed to satisfy s. COMM 64.03 or 64.09.

See list of acceptable standards at the end of this section.

Question: *What standards apply to water heaters that are used for simultaneous space and domestic water heating?*

Answer: *If a water heater is to be used for both space and domestic water heating loads, the following documents must be submitted to show code compliance of the equipment.*

Proof of listing of the water heater to the requirements listed per COMM 64.22(10).

Information from the water heater manufacturer showing that the water heater is designed and labeled for simultaneous space and domestic water heating;

Use of potable plumbing materials for any space-heating piping that is not isolated from the potable water piping.

If the water heater is to be installed as a direct vent sealed combustion chamber appliance, a building material approval covering that use for the specified water heater model number.

Note: The table on the following page is a tabular summary of UL 296 and UL 795.

(2) SAFETY CONTROLS.

(a) *General.* The complete safety control package for the heating and ventilating equipment shall comply with standards accepted by the department.

(b) *Limits and controls.* Oil and gas-fired heating equipment and electric heating equipment shall be equipped with primary (flame safeguard) safety controls, safety limit

switches, and burners or electric elements that comply with standards accepted by the department.

Note: The department recognizes UL 296/Oil Burners, and UL 795/Commercial-Industrial Gas-Heating Equipment, as acceptable standards that satisfy the requirements of subs. (1) and (2).

(3) LISTED EQUIPMENT. Complete factory assembled heating units shall be labeled by listing agencies approved by the department.

Application for approval of equipment for use as a direct vent sealed combustion chamber appliance may be made by submitting proof of compliance to the Office of Division Codes and Application, Safety and Buildings Division, or by providing the proof of compliance specified below to the local code enforcement authority for a specific installation. Proof of compliance with any of the ANSI standards is via testing and listing by an agency approved by the department (AGA, UL, or PFS Corp., ETL, Warnock Hersey, Northwestern).

Note: The department accepts heating equipment listed by the American Gas Association (AGA), Underwriters Laboratories (UL), ETL Testing Laboratories, Warnock Hersey International, Inc., Braun Intertec Corp. (Formerly Northwest Testing Laboratories, Inc.) and PFS corporation.

(4) UNLISTED EQUIPMENT. If the heating equipment is unlisted, the following provisions shall be taken:

(a) *Manufacturer's statement.* A statement from the equipment manufacturer shall be provided indicating the national standard with which the equipment complies.

(b) *Tests.* A test by a Wisconsin registered engineer shall be conducted on the output and safety controls, in accordance with the national standard used by the manufacturer. A statement regarding the test of the rating and safety controls shall be furnished for each installation unless an approval for the equipment is obtained from the department in accordance with sub. (5).

(5) EQUIPMENT APPROVAL. Equipment approval may be obtained from the department upon submission of a technical report, based on the test required in sub. (4) (b), together with the fee as specified in ch. COMM 2 for equipment approval.

Note: The purpose of the technical report is to show that the equipment is in complete compliance with the national standard by which the equipment is designed, constructed and tested.

COMM 64.21 LOCATION OF EQUIPMENT.

The various types of heating equipment for the corresponding types of occupancies in which the equipment may be located shall be installed as specified in Table 64.21.

Question: *May make-up air heaters be utilized to offset heat loss for more than make-up air (infiltration, envelope heat loss, etc.)?*

Answer: *No. Section COMM 64.20 requires equipment to be used in accordance with the standards to which they are listed. Direct gas-fired* ***make-up air heaters*** *may be installed in commercial and industrial occupancies for heating incoming outside air for the purpose of replacing air exhausted from the space. Direct gas-fired* ***industrial air heaters*** *may be installed in commercial and industrial occupancies to offset building heat loss. Make-up air heaters shall be installed as specified in s. COMM 64.21. Industrial air heaters shall be installed as specified in ss. COMM 64.21 and 64.22 (4). See s. COMM 64.22 (4)(e) for more information.*

Note #1: The footnotes below the table designate special requirements for the listed equipment.

Note #2: The department will accept net ratings as listed by Mechanical Contractors Association of America, Inc., Institute of Boiler and Radiator Manufacturers, and equipment tested according to commercial standard 140-47.

(1) CENTRAL FURNACES. For the purpose of this section, a central furnace shall be considered as a direct vent sealed combustion chamber appliance, if the furnace conforms to ANSI Z21.64 and has been issued a material approval under s. COMM 50.19.

Duct furnaces and unit heaters will be considered to be direct vent sealed combustion chamber appliances if they meet the standards for separated combustion appliances as specified in ANSI Z83.8 or ANSI Z83.9 and they meet the criteria for openings in the direct vent system specified below:

Parts of the appliance which, when opened or removed, may permit the direct vent system to communicate with the space within which the appliance is installed shall (1) require the use of a tool for displacement, or (2) the appliance shall not be operable when such parts are opened or removed. This provision does not apply to the outdoor terminals of the vent/air intake system or to openings used for pilot light ignition which are less than 28 square inches in size and which have attached cover plates with markings on or adjacent to the plate to the effect that plate is to be closed when the appliance is in service.

(2) BOILERS AND WATER HEATERS. For the purpose of this section, a low pressure boiler or a water heater shall be considered as a direct vent sealed combustion chamber appliance, if:

(a) The boiler or water heater conforms to those parts of ANSI Z21.13, Z21.10.1, or Z21.10.3, whichever is applicable, relating to direct vent appliances.

(b) All parts of the direct vent system for the boiler or water heater conform to s. 1.1.7 of ANSI Z21.64; and

(c) The boiler or water heater has been issued a material approval under s. COMM 50.19.

TABLE 64.21 - LOCATION OF EQUIPMENT

Location and Type of Occupancy	Vented Units									Unvented Units		Electric	Water or Steam
	Gas or Oil or Solid Fuel Boilers	Gas or Oil or Solid Fuel Furnaces and Water Heaters		Gas or Oil Unit Heaters	Gas or Oil Infrared		Gas or Oil Space Heater	Solid Fuel Space Heater[1,2]	Gas Direct Vent Sealed Combustion Appliance[1 8]	Gas Direct Fired Make-up Air[3,4]	Gas Infrared	Furnaces, Unit Heaters, Heat	Unit Ventilators, Heaters, Make-Up
	Rated[19]	Rated[19]			Closed Combustion Infrared Equipment with Surface Temperatures not Exceeding 1500°F	Open Flame Infrared Equipment with Surface Temperatures Exceeding 1500°F			Rated Enclosure Not			Pumps, Baseboard Heaters, etc.	Air Units, Baseboard Heaters, etc.
	Enclosure	Enclosure	Sus-pended[5]	Sus-pended[5]	Suspended[5]				Required	Suspended[5]	Suspended[5]		
Type of Occupancy													
Factories	Yes[5]	Yes[5]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Mercantile Buildings	Yes[5]	Yes	Yes	Yes	Yes	Yes	N.P.[5,6]	N.P.[6]	Yes	N.P.	N.P.		
Office Buildings	Yes[5]	Yes	Yes	Yes	Yes	N.P.	N.P.[5,6]	N.P.[6]	Yes	N.P.	N.P.		
Places of assembly, entertainment, recreation, worship or dining (100 persons or less)	Yes[5]	Yes[20]	Yes	Yes.	Yes	Yes	N.P.[5,6]	N.P.[6]	Yes	N.P.[7]	N.P.		
Tennis Facilities (court areas only)	Yes[5]	Yes	Yes	Yes	Yes	Yes	N.P.[5,6]	N.P.[6]	Yes	N.P.	N.P.		
Tennis Facilities (all other areas)	Yes[5]	Yes	Yes	Yes	Yes	N.P.	N.P.[5,6]	N.P.[6]	Yes	N.P.	N.P.		
Theaters and places of assembly, entertainment, recreation, worship or dining (more than 100 persons)	Yes	Yes	Yes	Yes	Yes	N.P.	N.P.	N.P.	Yes	N.P.	N.P.	Permitted in all Occupancies	Permitted in all Occupancies
Restaurants	Yes	Yes[20]	Yes	Yes	Yes	N.P.	N.P.	N.P.	Yes	N.P.[7]	N.P.		
Type of Occupancy													
Tennis Facilities (court areas only)	Yes	Yes	Yes	Yes	Yes	Yes	N.P.	N.P.	Yes	N.P.	N.P.		
Tennis Facilities													

(all other areas)	Yes	Yes	Yes	Yes	Yes	N.P.	N.P.	N.P.	Yes	N.P.	N.P.	

TABLE 64.21 - LOCATION OF EQUIPMENT(cont.)

Location and Type of Occupancy	Vented Units									Unvented Units		Electric	Water or Steam
	Gas or Oil or Solid Fuel Boilers	Gas or Oil or Solid Fuel Furnaces and Water Heaters		Gas or Oil Unit Heaters	Gas or Oil Infrared		Gas or Oil Space Heater	Solid Fuel Space Heater[1,2]	Gas Direct Vent Sealed Combustion Appliance[18]	Gas Direct Fired Make-up Air[3,4]	Gas Infrared	Furnaces, Unit Heaters, Heat Pumps, Baseboard Heaters, etc.	Unit Ventilators, Heaters, Make-Up Air Units, Baseboard Heaters, etc.
	Rated[19] Enclosure	Rated[19] Enclosure	Suspended[5]	Suspended[5]	Closed Combustion Infrared Equipment with Surface Temperatures not Exceeding 1500°F Suspended[5]	Open Flame Infrared Equipment with Surface Temperatures Exceeding 1500°F			Rated Enclosure Not Required	Suspended[5]	Suspended[5]		
Schools and other places of Instruction	Yes	Yes[20]	Yes	Yes	Yes	N.P.[10]	N.P.	N.P.	Yes	N.P.[9]	N.P.		
Hospitals, Nursing Homes and Penal Institutions	Yes	Yes[20]	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.[22]	N.P.	N.P.		
Residential Occupancies	Yes	Yes	N.P.	N.P.	N.P.	N.P.	N.P.[11]	N.P.[14]	Yes	N.P.	N.P.		
Hazardous Occupancies													
Garages	Yes	Yes	Yes[12]	Yes[12]	Yes	Yes	N.P.[15]	N.P.	Yes	Yes[12]	Yes[12]		
Aircraft Hangers	Yes	Yes	Yes[13]	Yes[13]	Yes[13]	Yes[13]	N.P.	N.P.	Yes	Yes[13]	Yes[13]		
Day Care Centers	Yes	Yes	Yes	Yes	Yes	N.P.	N.P.[6]	N.P.[6]	Yes	N.P.	N.P.		
Community-Based Residential Facilities[17]	Yes	Yes	N.P.	N.P.	N.P.	N.P.	N.P.[6]	N.P.[6]	Yes	N.P.	N.P.		

Footnotes on next page

N.P. = Not Permitted

Unlisted Occupancies - Use the listed occupancy in the table that is most similar to the subject occupancy.

Clearance to combustibles and combustible construction. 1. Heating equipment shall be installed in accordance with the manufacturer's recommendations to provide minimum clearance. In the absence of manufacturer's recommendations, a minimum clearance of 36 inches shall be provided. 2. Combustible construction, such as partitions, shelving or storage lockers, shall not encroach upon the required clearance.

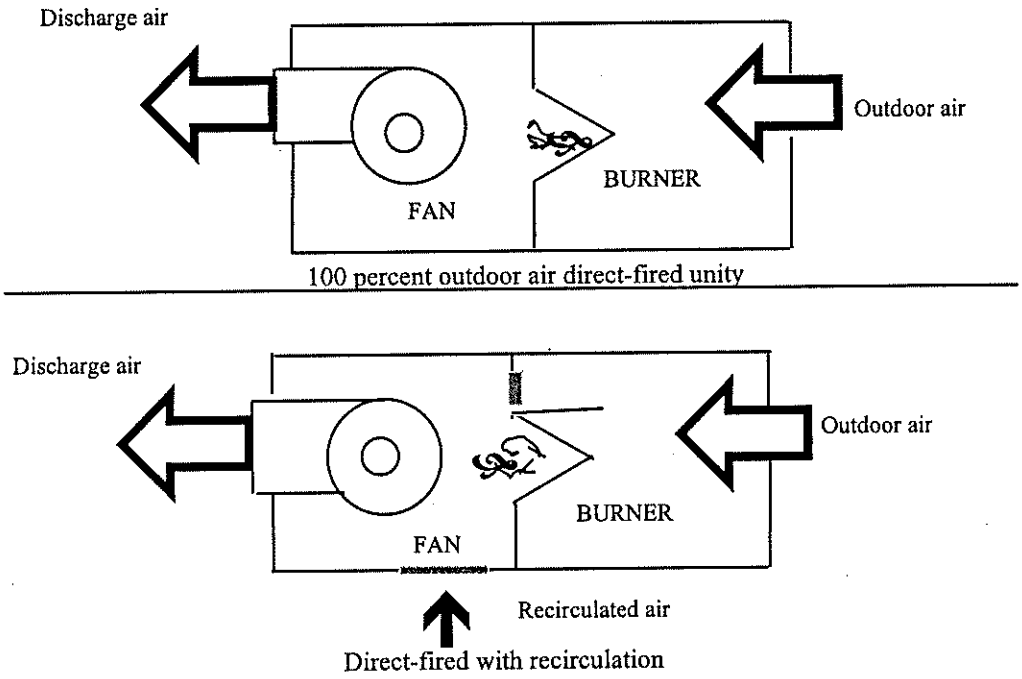
[1] See s. COMM 64.22 (7) (d) for fireplace requirements.

[2] All solid-fuel fired space heaters shall be located in occupied space or in a space provided with approved smoke detectors and located or guarded to maintain clearances to combustibles and prevent accidental damage or contact with hot surfaces. Solid-fuel burning stoves are limited to 150,000 Btu/hr output.

[3] Except as provided in Footnote 4, direct-fired make-up air units shall be mechanically exhausted in the range of 90% to 110% of the air supplied.

Question: *Table 64.21, footnote 3, specifies direct-fired make-up air units "shall be mechanically exhausted in the range of 90 to 110 percent of the air supplied." Some make-up air units recirculate room air to the heated air stream after the combustion zone. Does the amount of air supplied include this recirculated air?*

Answer: *The intent of the code is to balance the supply and exhaust. The air recirculated after the burner does not increase the amount of supplied air across the burner. If the amounts of outside air and the recirculated air were used to calculate the exhaust air, the building would become under-pressurized. (See drawing below identifying outside air and recirculated air flows.)*



When determining the amount of required exhaust, use 90 to 110 percent of the outside air supplied ***to the burner*** *of the make-up air unit.*

See s. COMM 64.22 (4)(b) for supply air requirements for unvented direct-fired industrial air heaters.

[4] See s. COMM 64.22 (4) for other permitted uses of direct-fired unvented natural gas heaters.

[5] Boiler and water heaters up to 200,000 Btu input, gas and liquid fuel-fired space heaters, suspended furnaces, vented and unvented unit heaters may be used without an enclosure where approved by the department. Exception: Suspended units in factories shall have no size limitation. All such units shall be located in an occupied space and suspended at least 7 feet above the floor. The blow-off pipe for suspended boilers and water heaters shall be extended down to within 6 inches of the floor. Infrared equipment shall be located at least 8 feet above the floor. Suspension of solid-fuel fired equipment is not permitted. See ss. COMM 54.14 (3) and 64.22 (3) for additional requirements.

[6] Permitted with combustion air ducted to unit in occupancies less than 3,000 square feet gross area and with occupant load less than 100 persons.

[7] Permitted in kitchens to provide make-up air for kitchen exhaust systems if located outside building or in a rated enclosure.

[9] Permitted only in shops with a 3-hour separation from other areas of the school building.

[10] Permitted only in shops with a 3-hour separation from other areas of the school building.

[11] Gas-fired, direct-vent wall furnaces are permitted in apartments and motels. Space heaters fired with liquid fuel may be used without an enclosure in motels and apartment buildings not more than one story in height.

[12] Suspended heating units are allowed in garages if located at least 8 feet off the floor. Suspension of solid-fuel fired equipment is not permitted.

[13] Suspended heating units are allowed if located at least 10 feet above the upper surface of the wings or engine enclosure of the aircraft. Suspension of solid-fuel fired equipment is not permitted.

[14] Solid-fuel fired space heaters are permitted in rowhouse units only.

[15] Waste oil burners are permitted provided they are installed on mezzanines or service platforms located at least 8'-0" above the main floor, are visible from the main floor and are guarded as specified in this section.

[17] See s. COMM 61.24 for requirements.

[18] See ss. COMM 51.01 (29a), 54.14 (1) (b), 55.29 (1) (b), 56.15 (1) (c), 57.14 (1) (c) 5., 59.21, 60.37 (2), 63.32 (1) (b) and 62.78 (1) (b) for additional requirements. Suspended units must be installed in accordance with this table, Note 5 and s. COMM 64.22 (3). Note: Electrical Code clearances specified in ch. COMM 16 apply. Electrical components and burners may be required to be at least 18 inches from the floor in "Class I" areas including garages.

Furnaces in hazardous occupancies, even if in a rated enclosure, must be installed at least 18 inches above the finished floor or must be rated for use in a hazardous location.

[19] See s. COMM 51.08 for hazard enclosure requirements.

[20] Gas-fired booster water heaters used exclusively for sanitizing dishes and cooking utensils need not be installed in fire-resistive enclosures.

[21] Includes water heaters used for space heating and for plumbing system supply.

[22] Direct vent sealed combustion chamber appliances may be used if placed within a rated enclosure described in Note 19.

A-64.20. EQUIPMENT RATINGS AND SAFETY CONTROLS. The department recognizes the following reference standards for the testing and installation of heating and ventilating equipment:

(1) American National Standards Institute, Inc., 1430 Broadway, New York, New York, 10018:

(a) GAS WATER HEATERS, Vol. I, ANSI Z21.10.1;

(b) GAS WATER HEATERS, Vol. III, ANSI Z21.10.3;

(c) GAS-FIRED ROOM HEATERS, Vol. 1, ANSI Z21.11.1;

(d) GAS-FIRED LOW PRESSURE STEAM AND HOT WATER BOILERS, ANSI Z21.13;

(e) GAS UNIT HEATERS, ANSI Z21.16;

(f) DOMESTIC GAS CONVERSION BURNERS, ANSI Z21.17;

(g) GAS APPLIANCE PRESSURE REGULATIONS, ANSI Z21.18;

(h) AUTOMATIC GAS IGNITION SYSTEMS AND COMPONENTS, ANSI Z21.20;

(i) AUTOMATIC GAS VALVES, ANSI Z21.21;

(j) RELIEF VALVES AND AUTOMATIC GAS SHUTOFF DEVICES FOR HOT WATER SYSTEMS, ANSI Z21.22;

(k) GAS APPLIANCE THERMOSTATS, ANSI Z21.23;

(l) GAS-FIRED DUCT FURNACES, ANSI Z21.34;

(m) GAS FILTERS ON APPLIANCES, ANSI Z21.35;

(n) GAS-FIRED GRAVITY AND FAN TYPE DIRECT VENT WALL FURNACES, ANSI Z21.44;

(o) GAS-FIRED GRAVITY AND FORCED AIR CENTRAL FURNACES, ANSI Z21.47;

(p) GAS-FIRED GRAVITY AND FAN TYPE FLOOR FURNACES, ANSI Z21.48;

(q) GAS-FIRED GRAVITY AND FAN TYPE VENTED WALL FURNACES, ANSI Z21.49;

(r) VENTED DECORATIVE GAS APPLIANCES, ANSI Z21.50;

(s) GAS-FIRED SINGLE FIREBOX BOILERS, ANSI Z21.52;

(t) GAS-FIRED HIGH PRESSURE STEAM AND HOT WATER BOILERS (Inputs not over 400,000 Btu/hour), ANSI Z21.59;

(u) DECORATIVE GAS APPLIANCES FOR INSTALLATION IN VENTED FIREPLACES, ANSI Z21.60;

(v) DIRECT VENT CENTRAL FURNACES, ANSI Z21.64;

(w) DIRECT GAS-FIRED MAKE-UP AIR HEATERS, ANSI Z83.4;

(x) GAS-FIRED HEAVY DUTY FORCED AIR HEATERS, ANSI Z83.5;

(y) GAS-FIRED INFRARED HEATERS, ANSI 283.6;

(z) GAS UNIT HEATERS, ANSI Z83.8;

(aa) GAS-FIRED DUCT FURNACES, ANSI Z83.9;

(bb) DIRECT GAS-FIRED DOOR HEATERS, ANSI Z83.17; and

(cc) DIRECT GAS-FIRED INDUSTRIAL AIR HEATERS, ANSI Z83.18.

(2) Canadian Standards Association, Certification Division, Rexdale, Ontario Canada, M9W 1R3;

(a) Solid-Fuel Fired Appliances For Residential Use, CSAB 366M.

(3) Energy Testing Laboratory of Maine, South Maine Vocational Technical Institute, South Portland, Maine 04106.

(a) Testing For Safety--Requirements And Test Procedures For Solid-Fuel Burning Central Heating Appliances And Combination Oil- And Solid-Fuel Burning Central Heating Appliances, ETLM Standard #78-1.

(4) International Conference of Building Officials, Inc., 5360 South Workman Mill Road, Whittier, California 90601:

(a) Research Committee Acceptance Criteria For Fireplace Heat Exchangers.

(5) Underwriters' Laboratories, Inc., 333 Pfingsten Road, Northbrook, Illinois 60062:

(a) CHIMNEY, FACTORY-BUILT, RESIDENTIAL TYPE AND BUILDING HEATING APPLIANCES, UL 103;

(b) FACTORY BUILT FIREPLACES, UL 127;

(c) OIL BURNERS, UL 296;

(d) CONTROLS, PRIMARY SAFETY FOR GAS- AND OIL-FIRED APPLIANCES, UL 372;

(e) SOLID FUEL FIRE CENTRAL FURNACES, UL 391;

(f) GAS VENTS, UL 441;

(g) HEATING APPLIANCES, ELECTRIC, UL 499;

(h) HEAT PUMPS, UL 559;

(i) TYPE L LOW-TEMPERATURE VENTING SYSTEMS, UL 641;

(j) OIL-FIRED BOILER ASSEMBLIES, UL 726;

(k) OIL-FIRED CENTRAL FURNACES, UL 727;

(l) OIL-FIRED FLOOR FURNACES, UL 729;

(m) OIL-FIRED WALL FURNACES, UL 730;

(n) OIL-FIRED UNIT HEATERS, UL 731;

(o) HEATERS, AIR AND DIRECT-FIRED HEATERS, OIL-FIRED, UL 733;

(p) FIREPLACE STOVES, UL 737;

(q) COMMERCIAL-INDUSTRIAL GAS HEATING EQUIPMENT (INPUTS OVER 400,000 Btu/hour), UL 795;

(r) HEATERS, ELECTRIC, FOR USE IN HAZARDOUS LOCATIONS; Class I, Groups A, B, C and D, and Class II, Groups E, F and G, UL 823;

(s) ELECTRIC BOILERS, UL 834;

(t) HEATERS, ELECTRIC DRY BATH, UL 875;

(u) FAN COIL UNITS AND ROOM FAN HEATER UNITS, UL 883;

(v) OIL-BURNING STOVES, UL 896;

(w) HEATERS, ELECTRIC AIR, UL 1025;

(x) HEATING EQUIPMENT, ELECTRIC BASEBOARD, UL 1042;

(y) HEATING EQUIPMENT, ELECTRIC CENTRAL AIR, UL 1096; and

(z) ROOM HEATERS, SOLID-FUEL TYPE, UL 1482

COMMENTARY: TABULAR SUMMARY UL STANDARD 296 AND UL STANDARD 795

Function/Burner Inputs	OIL BURNERS UL 296				COMMERCIAL/INDUSTRIAL GAS UL 795				
	3 GPH	7 GPH	20 GPH		Mechanical Draft Burners				
	400,000 Btu or less	1 million Btu or less	3 million Btu or less	Over 20 GPH 3 million Btu	Over 400,000 to 2,500,000	Over 2.5 to 5 million Btu	Over 5 to 12.5 million Btu	Over 12.5 million Btu	ATM Draft
Prepurge timing	--	--	--	--	4	4	4	4	90 sec[3]
Air changes	--	--	--	--	4	4	4	4	--
Interlock Controls (Recycle)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proven combustion air	8	8	8	8	Yes	Yes	Yes	Yes	--
Valve seal overtravel[9]	--	--	--	--	--	Optional	Yes	Yes	13
Low gas pressure	--	--	--	--	--	Yes[20]	Yes[20]	Yes[20]	13
High gas pressure	--	--	--	--	--	Yes[20]	Yes[20]	Yes[20]	13
Low fire start	11	11	11	11	11	11	11	11	13
High limit (press. or temp.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Low water cutoff	Boilers[21]	Boilers[21]	Boilers[21]	Boilers[21]	Boilers	Boilers	Boilers	Boilers	13
Pilot - Intermittent	Optional	Optional	Optional	--	Optional	Optional	Optional	Optional	12
Pilot - Interrupted	19	19	19	Yes[5]	Optional	Optional[2]	Optional[2]	Optional[2]	2, 10
Direct spark ignition	Yes	Yes	Yes	5	--	--	--	--	--
System & sequence approved safety control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Approved safety shutoff valves (SSOV)	IN BURNER DESIGN	IN BURNER DESIGN	IN BURNER DESIGN	--	Yes[14]	Yes[14]	Yes[14]	Yes[14]	Yes[13, 14]
No vent valve	--	--	--	--	--	--	--	Yes	13
Pilot valve	18	18	18	Yes	Yes[5]	Yes	Yes	Yes	Yes
Proved pilot	Optional	Optional	Optional	Yes	Yes	Yes	Yes	Yes	Yes
Trial for Pilot	17	17	17	15 sec	15 sec	10 sec	10 sec	10 sec	13
Trial for main flame	90 sec[2, 17]	30 sec[2, 17]	15 sec[2, 17]	10/30 sec[7]	15 sec[22]	10 sec	10 sec	10 sec	13
Flame failure response time	90 sec[17]	4 sec max[16,17]	4 sec max[15,17]	4 sec max	4 sec max	4 sec max	4 sec max	2 sec max	13
Valve closing time (max.)	23	23	23	23	5 sec max	1 sec max	1 sec max	1 sec max	13
Supervise main flame	17	17	17	Yes	--	Yes[2]	Yes[2]	Yes[2]	2, 10
Action on flame failure	Recycle optional[1]	1	1	Lockout or recycle	Lockout or recycle[6]	Lockout	Lockout	Lockout	13
Action on limit open	Close SSOV	Close SSOV	Close SSOV	Close SSOV	Close SSOV	Close SSOV	Close SSOV	Close SSOV	Close SSOV

See following page for footnotes

FOOTNOTES TO TABULAR SUMMARY UL STANDARD 296 AND UL STANDARD 795:

SSOV = Safety shutoff valve.

1 May relight if ignition is re-energized within 0.8 sec. See 15 and 16.

2 Where intermittent pilot is desired, it is allowable to switch from pilot detector to main flame detector if main flame detector responds to main flame only.

3 Without shutters, no prepurge required.

4 Options (whichever is chosen, a minimum of 4 air changes must be provided):

30 sec at high fire rate; OR

60 sec at 1/2 high fire rate; OR

90 sec at 1/3 high fire rate.

5 With 2-stage lightoff, direct ignition is permitted if first stage is 20 gph or less (requirements for 20 gph or less apply). Pilot is required if igniting more than 20 gph.

6 Lockout on interrupted pilot applications; recycle on intermittent pilot applications.

7 10 sec for distillate fuel (No. 1 or No. 2); 30 sec for residual fuel (No. 4, 5, 6).

8 Conventional type pressure burner-none needed. Needed for applications with combustion air supply separate from oil supply.

9 Valve seal overtravel switch can be wired into either the start circuit or pre-ignition interlock circuit (if provided).

10 Interrupted pilot over 2.5 million Btuh if modulating or high/low firing rate. Otherwise over 5 million Btuh.

11 If low fire start is not proved, UL will test for smooth lightoff at high fire.

12 Intermittent up to 5 million Btuh unless firing rate control is over 2,500,000 Btuh.

13 Requirements same as mechanical draft burners.

14 See Table 1 at end of footnotes for main gas valves.

15 Up to 15 sec is permitted if intermittent ignition is employed, or if the ignition system is re-energized in not more than 0.8 sec after flame is extinguished.

16 Up to 30 sec is permitted if intermittent ignition is employed, or if the ignition system is re-energized in not more than 0.8 sec after flame is extinguished.

17 If proved pilot igniter used, may apply timings for> 20 gal flame safeguard control.

18 Required for electrically ignited, gas-piloted systems.

19 Interrupted pilot may be required if using flame safeguard control with a proved pilot. Otherwise, interrupted pilot is optional.

20 Safety shutdown by this limit can be accomplished either by manual reset limits or in the programmer limit circuit.

21 Required on boilers fired by oil burners-not a requirement of UL 296.

22 If intermittent pilot is used, no main burner flame-establishing period is required.

23 If a separate oil valve is used, it must close within 5 sec max when de-energized.

TABLE 1 - AUTOMATIC MAIN GAS SAFETY SHUTOFF VALVES (SSOV) FOR MECHANICAL OR ATMOSPHERIC BURNERS - UL 795 REQUIREMENTS, EFFECTIVE OCTOBER 1, 1974

	400,000 to 2,500,000 BTUH	Over 2,500,000 to 5,000,000 BTUH	Over 5,000,000 to 12,500,000 BTUH	Over 12,500,000 BTUH
Main Valve Requirement	One valve rated for safety shutoff services (SSOV). Closing time 5 sec.	Two SSOV's in series, or one SSOV of the type incorporating a valve seal overtravel interlock. Closing time 1 sec max.	Two SSOV's in series, one of which incorporates a valve seal overtravel interlock. Closing time 1 sec max.	Two SSOV's in series, one of which incorporates a valve seal overtravel interlock. When fuel gas has specific gravity of less than 1.0, include a N.0. 3/4 inch or larger electrically operated valve in a vent line between the two SSOV's.

COMM 64.22 SPECIAL REQUIREMENTS.

(1) BOILERS AND PRESSURE VESSELS.

(a) *Construction standards.* Boilers and pressure vessels shall be constructed and installed in compliance with the standards of the American Society of Mechanical Engineers, as adopted under chs. COMM 41-42.

(b) *Installation notification.* The installing contractor shall notify the department of boiler installation, in accordance with the requirements of s. COMM 41.41 (1), before the boiler or pressure vessel is put into operation.

(2) FURNACES. Forced-air heating systems shall be designed to prevent a negative pressure on the heat exchanger.

(3) SUSPENDED EQUIPMENT.

(a) Equipment suspended as specified in s. COMM 64.21 shall be installed in an occupied space. Suspended equipment may be used in multiple tenant buildings providing the equipment is located in tenant spaces of an occupancy use where suspended equipment is permitted. The equipment shall be visible to persons within the room.

(b) Suspended units shall be designed and listed for such use. Furnaces designed for floor mounting only may be mounted on platforms that serve only to hold the unit.

(c) Where the clearance to the floor specified in s. COMM 64.21 cannot be provided for suspended units, provisions shall be made for maintaining clearances to combustibles and collision protection. The collision protection shall be capable of withstanding a horizontal impact load of 1,000 pounds per lineal foot. The unit shall be visible to the occupants of the room. The unit shall be suspended to provide a minimum clearance of 18 inches from the floor. The minimum clearances specified by the manufacturer shall also be provided.

(d) In factories, where the clearance to the floor specified in s. COMM 64.21 cannot be provided, a floor mounted unit may be used in accordance with this paragraph. Provisions shall be made for maintaining clearances to combustibles and collision protection. The collision protection shall be capable of withstanding a horizontal impact load of 1000 pounds

per lineal foot. The unit shall be visible to the occupants of the room. The unit shall be installed to provide a minimum clearance of 18 inches from the floor to the burner. The minimum clearances specified by the manufacturer shall also be provided.

Note: See Electrical Code, Ch. COMM 16, for clearance requirements for electrical components in hazardous locations.

(e) Duct furnaces and unit heaters required to be suspended under s. COMM 64.21 may be installed in an unoccupied or concealed space without a rated enclosure providing the following conditions are met:

1. The appliance has been issued a material approval under s. COMM 50.19 recognizing conformance to the requirements for separated combustion appliances as specified in ANSI Z83.8 or Z83.9, whichever is applicable, and conformance of all parts of the direct vent system for the duct furnace or unit heaters to s. 1.1.7 of ANSI Z21.64; and

2. The unit is properly suspended and clearances to combustibles are maintained as specified in the manufacturer's listing.

Duct furnaces and unit heaters which are direct vent sealed combustion chamber appliances may be installed in unoccupied or concealed spaces with clearances to combustibles as listed. When installed in occupied spaces, the equipment must still be suspended and guarded as specified in s. COMM 64.22(3). The equipment may only be installed in the occupancies specified for unit heaters or duct furnaces in Table 64.21.

Suspended equipment is allowed in a building, such as a warehouse, that is normally unoccupied, provided the equipment is visible to persons within the room when occupied. The suspended equipment is not however, permitted in an unoccupied room, such as an inactive storage room in a normally occupied office building.

(4) GAS OR OIL-FIRED RADIANT HEATERS AND DIRECT FIRED UNVENTED NATURAL GAS HEATERS. Gas- or oil-fired radiant heaters and direct fired unvented natural gas heaters are subject to the following provisions:

(a) The heaters shall be equipped with an automatic pilot of the complete shutoff type or with a 100% shutoff electric ignition;

(b) If unvented radiant heaters or direct fired unvented natural gas heaters are used, mechanical means shall be provided to supply at least 4 cfm of outside air per 1000 Btu per hour input of installed heaters;

(c) The amount of air supplied which exceeds the building's designed infiltration rate shall be relieved through relief openings or interlocked power exhaust. Relief openings may be louvers, gravity siphon-type roof ventilators, counterbalanced gravity dampers or motorized dampers provided the motorized damper is interlocked with the supply fan so as not to permit blower operation until the damper is proved in the open position.

Unvented radiant heaters or direct fired unvented natural gas heaters require a mechanical means of supply air. If the amount of air supplied can be shown to be less than the infiltration rate, additional supply air is not required.

(d) Oil-fired radiant heaters shall be equipped with mechanical pressure-atomizing burners; and

(e) Direct fired unvented natural gas heaters shall comply with ANSI Z83.18.

(5) SPACE HEATERS. Space heaters shall comply with the following provisions:

(a) The burner of the appliance shall be enclosed with a metal housing so constructed that there will be no open flame and the burner housing shall be effectively guarded against personal contact. The arrangement shall be such that the shield will prevent any combustible material in the vicinity of the appliance from coming in contact with the flame or with the housing that encloses the burner. Oil-fired space heaters shall be equipped with a mechanical pressure atomizing burner; and

(b) Space heaters shall not be equipped with duct extensions beyond the vertical and horizontal limits of the metal enclosure.

(c) The use of unvented fuel-fired space heating equipment shall be prohibited except for the equipment types and occupancies specified in Table 64.21.

The use of unvented space heaters fueled by natural gas, kerosene, alcohol or other fuel shall be prohibited based on the problems associated with oxygen depletion; contamination from carbon monoxide, carbon dioxide, nitrogen dioxide, formaldehyde and other combustion-related contaminants; and water vapor development. This includes unvented natural gas fireplaces. The department does not allow U.L. listed oxygen depletion warning devices to offset this restriction.

(6) EQUIPMENT IN HAZARDOUS LOCATIONS. The types of heating and ventilating equipment that may be installed in hazardous locations (as defined in Article 500 of the National Electrical Code as adopted by reference in ch. COMM 16) are as follows:

(a) Listed low-pressure steam or hot water unit heaters and makeup air units; and

(b) Listed electric units.

(7) FIREPLACES AND FIREPLACE STOVES. Masonry fireplaces, factory-built fireplaces and factory-built fireplace stoves shall be constructed and installed in accordance with the NFPA standard No. 211--Standard for Chimneys, Fireplaces and Vents.

(a) *Masonry fireplaces.*

1. Masonry fireplaces shall be constructed of solid masonry units, stone or reinforced portland or refractory cement concrete.

a. Where a lining of low-duty firebrick complying with the provisions of ASTM C64, or the equivalent, at least 2 inches thick laid-in fire-clay mortar complying with the provisions of ASTM C105, or the equivalent, or other approved lining is provided, the total thickness of back and sides, including the lining, shall be not less than 8 inches.

b. Where the lining described in subpar. a. is not provided, the thickness of back and sides shall be not less than 12 inches.

2. Steel fireplace units incorporating a firebox liner of not less than 1/4 inch thick steel and an air chamber shall be installed with masonry to provide a total thickness at the back and sides of not less than 8 inches, not less than 4 inches of which shall be solid masonry.

3. Warm air ducts employed with steel fireplace units of the circulating air type shall be constructed of metal or masonry.

4. Fireplace hearth extensions of approved noncombustible material for all fireplaces shall be provided.

a. Where the fireplace opening is less than 6 square feet, the hearth extension shall extend at least 16 inches in front of, and at least 8 inches beyond each side of the fireplace opening.

b. Where the fireplace opening is 6 square feet or larger, the hearth extension shall extend at least 20 inches in front of, and at least 12 inches beyond each side of the fireplace opening.

c. Where a fireplace is elevated above or overhangs a floor, the hearth extension shall also extend over the area under the fireplace.

d. Fireplaces constructed of masonry or reinforced portland or refractory cement concrete shall have hearth extensions of brick, concrete, stone, tile or other approved noncombustible material properly supported and with no combustible material against the underside thereof. Wooden forms or centers used during the construction of hearth and hearth extension shall be removed when the construction is completed.

5. All wood beams, joists and studs shall be trimmed away from fireplaces. Headers supporting trimmer arches at fireplaces shall be not less than 20 inches from the face of the chimney breast.

Note: Trimmers shall be not less than 6 inches from the inside face of the nearest flue lining.

6. Woodwork shall not be placed within 4 inches of the back face of a fireplace.

7. Woodwork shall not be placed within 6 inches of a fireplace opening. Woodwork above and projecting more than 1 1/2 inches from a fireplace opening shall not be placed less than 12 inches from the top of a fireplace opening.

(b) *Factory-built fireplaces and fireplace stoves.* Factory-built fireplaces and fireplace stoves shall be installed according to the requirements of the approval as specified in s. COMM 64.20.

(c) *Hearth opening protection.* Fireplaces and fireplace stoves shall be equipped with safety screens or glass doors to prevent the escape of sparks and embers.

(d) *Permitted installations.* Fireplaces are permitted in the following applications.

1. In all occupancies within the scope of chs. COMM 54 and 55;

2. In health care facilities as specified in s. COMM 58.24 (3);

3. In common use areas of residential occupancies; and

4. In individual living units of residential occupancies except that fireplaces in individual living units of hotels and motels shall comply with the following:

a. The appliance shall be gas-fired and shall be tested and installed in accordance with standards recognized by the department.

Note: ANSI Z21.50 and ANSI Z32.60 are recognized by the department. See s. COMM 64.20 (3) for listing requirements.

b. The appliance shall be designed to be ignited by an intermittent ignition device.

c. The fire box shall be provided with a permanently installed glass partition to prevent access to the fire box and appliance. The partition shall be designed to be compatible with the appliance listing.

Note: Operation of the appliance via a control located outside the fire box will be necessary.

d. Outside air shall be provided for combustion in accordance with s. COMM 64.09. Combustion air shall not be provided via infiltration.

(8) FLOOR-STANDING VENTED OR UNVENTED EQUIPMENT. Floor-standing, vented or unvented unit heaters, furnaces and boilers in metal fabricating plants, foundries and machine shops are exempt from the requirements of s. COMM 54.14.

COMM 54.14 does not exist. The correct reference is COMM 51.08

(9) HEAT EXCHANGER CORROSION PROTECTION. If the entering air to the heat exchanger of all gas-fired equipment is 30°F or lower, the heat exchanger and burners shall be constructed of corrosion-resistive materials.

(10) WATER HEATERS USED FOR SIMULTANEOUS SPACE HEAT AND HOT WATER SUPPLY FOR PLUMBING SYSTEM.

(a) *Water heater construction standards.* Water heaters that provide simultaneous space heat and hot water supply for a plumbing system shall be listed for compliance with ANSI Z21.10.1 or ANSI Z21.10.3 and be specifically designed for such use. The water heater shall have an input rating of 100,000 Btu/h or less.

(b) *Heat exchanger unit.* Heat exchanger units that are part of the plumbing system shall meet the requirements of Chs. COMM 81-84.

(c) *Sizing.* The water heater shall be sized with a sufficient capacity to simultaneously offset the heat loss at design temperatures and meet the other system demands it serves. The design recovery rate of the water heater shall be less than one hour for the hot water load for plumbing at design temperatures.

Note: See ch. COMM 84 for additional requirements for water heating equipment and s. COMM 63.20 for energy conservation requirements.

(11) PROCESS EQUIPMENT. Section COMM 64.21 does not apply to process equipment unless the equipment provides water supply for a plumbing system or provides space heating, exclusive of waste heat.

COMM 64.23 PIPING.

(1) PIPE SIZES AND ARRANGEMENT. All supply and return piping carrying steam, hot water or other fluids, air-line piping and auxiliary equipment shall be of appropriate sizes, elevations and arrangements to accomplish the calculated services in practical operation, without undue noise, stress or other detriment.

(2) EXPANSION AND CONTRACTION. The piping for the heating system shall be equipped with anchors, expansion swings or joints, supports and similar devices to relieve stress and strains caused by temperature change of the pipe material.

(3) PIPE INSULATION. All supply and return piping carrying steam, hot water or other fluids shall be covered with insulating material where the pipes pass through occupied areas and the surface temperature exceeds 180°F., unless guarded.

This requirement is intended to address the safety issue by requiring pipes to be guarded to prevent accidental touching or insulated to reduce chance of injury. It should not be confused with COMM 63.29(2) requirement for pipe insulation where the fluid temperature exceeds 80°F, which is an energy conservation requirement.

(4) PIPE PROTECTION. No pipe carrying hot water, steam, or other fluid at a surface temperature exceeding 250°F. shall be placed within one inch of any woodwork, pass through a combustible floor, ceiling or partition, unless the pipe is protected by a metal tube one inch larger in diameter than the pipe or with approved pipe covering.

(5) GAS OR OIL INSTALLATIONS.

(a) *Piping installations.* All gas piping and all oil piping shall comply with the following standards:

1. National Fuel Gas Code, NFPA No. 54; or
2. Installation of Oil-Burning Equipment, NFPA No. 31.

(b) *Oil tank installation.* Oil tanks serving oil-burning equipment shall be installed in accordance with ch. COMM 10.

NFPA-54, National Fuel Gas Code - Gas Piping Summary

Copper Piping

Question: *Is copper piping for natural gas permitted?*

Answer: *Yes, if, per s. 2.6.3 of NFPA, there are no more than .3 grains of hydrogen sulfide per 100 cubic feet of gas. To this department's knowledge, all gas delivered to Wisconsin meets this limit.*

Part 1 General

1.1.1. Code applies from point of delivery to gas utilization device for both natural and LP gases.

["Piping" includes pipe (rigid) and tubing (flexible).]

Part 2 Design, Materials and Components

2.4.1. Piping sized to provide an adequate supply of gas--see following tables.

2.6.2. Acceptable pipe - steel (black or galvanized), wrought iron, copper, brass*, aluminum alloy (aboveground interior only).*

2.6.3. Acceptable tubing - copper (Type K or L), aluminum alloy (aboveground interior only), steel.*

**Max. 0.3 grains of hydrogen sulfide/100 ft.3 (Wisc. okay).*

2.6.4. Plastic pipe and tubing acceptable for underground exterior uses only. (Plastic LP gas piping per NFPA 58.)

2.6.8. Acceptable joints and fittings.

-Pipe - threaded, flanged, welded, flared (nonferrous).

-Tubing - AGA approved tubing fittings, brazed (1,000 DF min., no phosphorous), flared.

Pipe dope or tape on threaded joints unless not required by manufacturer.

2.7.2. No sources of ignition (electrical equipment, flue gas exhausts, combustion air intakes, etc.) within 3 feet of gas meters.

2.8.4. Interior pressure regulators to be vented outside or vent-limited.

2.8.7. Per NFPA 58, s. 3-2.5.4, LP gas regulator to be vented so outlet is no less than 3 feet horizontally away from any building opening below the outlet.

Part 3 Installation

3.1.2. Underground piping to have 18" cover, 12" if not subject to hazard.

3.1.6. Underground piping to be sleeved and caulked at foundation entrance.

3.1.7. Piping underneath buildings in a conduit vented to outside and sealed at building entrance.

3.2. Aboveground exterior piping securely supported and coated or wrapped at foundation entrance.

3.3.4. Piping okay in accessible above-ceiling spaces, including plenums, but no valves allowed.

3.3.5. Piping not allowed in:

-Circulating air ducts.

-Clothes chute.

-Chimney or gas vent.

-Ventilating duct.

Okay in combustion air duct.

3.3.6. Piping support spacing:

-Pipe - 1/2" - 6'; 3/4" & 1" - 8'; 1 1/4" - 10'

-Tubing - 1/2" - 4'; 5/8" & 3/4" - 6'; 7/8" & 1" - 8'

3.4.2. Piping not allowed in solid (such as concrete) partitions.

Tubing to be protected in partitions with 16 gauge sheet metal or equivalent (against nail penetration):

-Horizontal runs - protected for full length.

-Vertical runs - protected at penetrations of plates and firestops and 4" beyond if not rigidly secured.

3.4.3. Piping in slab floors to be laid in channels with removable covers.

3.4.4. Following fittings not allowed in concealed piping:

-Unions.

-Tubing fittings including brazed fittings.

-Running threads.

-Right-and-left couplings.

-Bushings.

-Swing joints.

3.4.5. Reconnection into existing concealed piping:

-In pipe by welding, flanges, or ground joint union with center punched nut.

-Not allowed in tubing.

3.8. Outlets:

-Not allowed behind doors.

-Unthreaded pipe to protrude at least 1" out of walls and ceilings and 2" above floors (quick connect devices exempt).

-To be capped when not used.

3.9. Branch pipes - no T's off bottom of horizontal pipes.

3.10.1. Gas shutoff valve required upstream of pressure regulator.

3.10.3. Exterior shutoff valve required at each building served.

3.14. Piping to be electrically continuous and bonded to any grounding electrode (may use equipment grounding conductor) but not to be used as a grounding electrode.

Part 4 Testing

Installer shall test system at greater than 3 psi or 1-1/2 times working pressure for at least 10 minutes prior to putting in service. If pressure drop is detected, then joints shall be tested with gas detector, soap and water or equivalent nonflammable solution. (LP gas system operating at 0.5 psig or less may be tested at between 10 and 14 inches water column pressure.)

Part 5 Equipment (Connections to Piping)

5.1.16. Equipment not to strain piping.

5.5.1. Equipment connectors allowed:

-Rigid pipe.

-Tubing.

-Listed connectors (in same room only and where not subject to damage).

-Listed hose connector (outdoors only).

5.5.4. Equipment shutoffs (See also Comm 23.16(4)a).:

-Within 6' of appliance.

-Upstream of connector.

-Union downstream of valve.

5.5.6. Sediment trap required at all appliances except lights, ranges, dryers, and outdoor grilles.

5.5.7. Piping not to interfere with appliance servicing (24" away from access panels).

Sizing Gas Piping

1. Determine appliance gas demand from name plate or Table C-1.

-Natural Gas - Use cubic feet per hour which equals BTU input divided by average BTU heating value per cubic foot of gas (typically 1,000 BTU per cubic foot).

-LP Gas - Use BTU input.

2. Measure the length of piping from point of delivery to the most remote outlet in the building.

3. Using the appropriate table, select the column showing the measured length or next longer length. This is the only column that will be used for the whole system.

4. In the selected column, find the gas demand, or next higher demand, of the most remote outlet and piping section.

5. Opposite this demand figure, find the correct gas piping size in the far left column.

6. Proceed in a similar manner for each outlet and each section of gas piping using the same column. For each piping section, determine the total gas demand supplied by that section.

Table C-1

Approximate Gas Input for Typical Appliances

Appliance	Input Btu per hour (Approximate)
Range, Free Standing, Domestic	65,000
Built-In Oven or Broiler Unit, Domestic	25,000
Built-In Top Unit, Domestic	40,000
Water Heater, Automatic Storage	
30 to 40 Gallon Tank	45,000
Water Heater, Automatic Storage	
50 Gallon Tank	55,000
Water Heater, Automatic Instantaneous	
(2 Gallons Per Minute	142,800
Capacity (4 Gallons Per Minute	285,000
(6 Gallons Per Minute	428,400
Water Heater, Domestic, Circulating or Side-Arm	35,000
Refrigerator	3,000
Clothes Dryer, Type 1 (Domestic)	35,000
Gas Light	2,500
Incinerator, Domestic	35,000

For specific appliances or appliances not shown above, the input should be determined from the manufacturer's rating.

Table C-4

Maximum Capacity of Pipe in Cubic Feet of Gas per Hour for Gas Pressures of 0.5 Psig or Less and a Pressure Drop of 0.5 Inch Water Column

(Based on a 0.60 Specific Gravity Gas)

Nominal Iron Pipe Size,	Internal Diameter,	Length of Pipe, Feet													
Inches	Inches	10	20	30	40	50	60	70	80	90	100	125	150	175	200
1/4	.364	43	29	24	20	18	16	15	14	13	12	11	10	9	8
3/8	.493	95	65	52	45	40	36	33	31	29	27	24	22	20	19
1/2	.622	175	120	97	82	73	66	61	57	53	50	44	40	37	35
3/4	.824	360	250	200	170	151	138	125	118	110	103	93	84	77	72
1	1.049	680	465	375	320	285	260	240	220	205	195	175	160	145	135
1 1/4	1.380	1,400	950	770	660	580	530	490	460	430	400	360	325	300	280
1 1/2	1.610	2,100	1,460	1,180	990	900	810	750	690	650	620	550	500	460	430
2	2.067	3,950	2,750	2,200	1,900	1,680	1,520	1,400	1,300	1,220	1,150	1,020	950	850	800
2 1/2	2.469	6,300	4,350	3,520	3,000	2,650	2,400	2,250	2,050	1,950	1,850	1,650	1,500	1,370	1,280
3	3.068	11,000	7,700	6,250	5,300	4,750	4,300	3,900	3,700	3,450	3,250	2,950	2,650	2,450	2,280
4	4.026	23,000	15,800	12,800	10,900	9,700	8,800	8,100	7,500	7,200	6,700	6,000	5,500	5,000	4,600

Table C-6
Maximum Capacity of Semi-Rigid Tubing in Cubic Feet
of Gas per Hour for Gas Pressures of 0.5 Psig or Less
and a Pressure Drop of 0.5 Inch Water Column
(Based on a 0.60 Specific Gravity Gas)

Outside Diameter,	Length of Tubing, Feet													
Inch	10	20	30	40	50	60	70	80	90	100	125	150	175	200
3/8	27	18	15	13	11	10	9	9	8	8	7	6	6	5
1/2	56	38	31	26	23	21	19	18	17	16	14	13	12	11
5/8	113	78	62	53	47	43	39	37	34	33	29	26	24	22
3/4	197	136	109	93	83	75	69	64	60	57	50	46	42	39
7/8	280	193	155	132	117	106	98	91	85	81	71	65	60	55

Table C-16
Maximum Capacity of Pipe in Thousands of BTU per Hour
of Undiluted Liquefied Petroleum Gases (at 11 Inches
Water Column Inlet Pressure)
(Based on a Pressure Drop of 0.5 Inch Water Column)

Nominal Iron Pipe Size,	Length of Pipe, Feet											
Inches	10	20	30	40	50	60	70	80	90	100	125	150
1/2	275	189	152	129	114	103	96	89	83	78	69	63
3/4	567	393	315	267	237	217	196	185	173	162	146	132
1	1,071	732	590	504	448	409	378	346	322	307	275	252
1 1/4	2,205	1,496	1,212	1,039	913	834	771	724	677	630	567	511
1 1/2	3,307	2,299	1,858	1,559	1,417	1,275	1,181	1,086	1,023	976	866	787
2	6,221	4,331	3,465	2,992	2,646	2,394	2,205	2,047	1,921	1,811	1,606	1,496

Table C-17
Maximum Capacity of Semi-Rigid Tubing in Thousands
of BTU per Hour of Undiluted Liquefied Petroleum Gases
(at 11 Inches Water Column Inlet Pressure)
(Based on a Pressure Drop of 0.5 Inch Water Column)

Outside Diameter,	Length of Tubing, Feet									
Inch	10	20	30	40	50	60	70	80	90	100
3/8	39	26	21	19	--	--	--	--	--	--
1/2	92	62	50	41	37	35	31	29	27	26
5/8	199	131	107	90	79	72	67	62	59	55
3/4	329	216	181	145	131	121	112	104	95	90
7/8	501	346	277	233	198	187	164	155	146	138

Shutoff Valves

Question: *Can a water-type valve be used as a manual gas shutoff valve?*

Answer: *No. Gas shutoff valves must be approved by AGA or UL for such use. Their approval will be indicated on the valve.*

Question *Is a manual shutoff device acceptable on a gas fireplace starter?*

Answer: *Yes. (Gas log systems shall be installed per their listing.)*

Subchapter V -- Air Delivery Systems

COMM 64.31 DUCT DESIGN.

All ducts shall be designed to promote the unrestricted flow of air.

Note: The department will accept air duct velocities designed in accordance with the standards of the ASHRAE Handbook of Fundamentals, published by the American Society of Heating, Refrigerating and Air Conditioning Engineers.

COMM 64.32 DUCT USE.

No duct designed for the transmission of air shall be used for any other purpose.

COMM 64.33 UNDERGROUND DUCT CONSTRUCTION AND INSTALLATION.

(1) MATERIALS.

(a) *Tile ducts.* All underground duct systems using cement tile, glazed clay tile and other tile having a composition of cement and mineral shall be waterproof and shall have sufficient strength to prevent failure of duct at the time of installation and while in service. All fittings shall be designed with bell and spigot or slip-joint connections. All joints shall be waterproof.

(b) *Plastic and metal ducts.* Metal, plastic-coated metal ducts, and other approved materials may be used for underground systems if encased in not less than 2 inches of concrete. The ducts shall be waterproof, noncombustible, smooth and of sufficient strength to prevent collapse. The sealing material for fittings and joints shall be approved by the department.

1. Exception. Solid polyvinyl ducts and fittings and polyvinyl chloride (pvc)-clad metallic ducts and fittings need not be encased in concrete provided the space around the ducts and fittings is backfilled with sand or similar fill material.

(2) DUCT INSULATION. All underground ducts shall be insulated as specified in s. COMM 63.29.

(3) DUCT DRAINAGE. Underground ducts shall be provided with drainage to a lower room of the building or to a sump. No duct shall be connected to a sewer.

(4) DUCT INLETS AND OUTLETS. A water-tight connection shall be provided where the inlet and outlet risers are connected to underground ducts.

(5) PIPING. Nonhazardous piping may be installed in underground ducts if it does not restrict the air flow.

COMM 64.34 DUCT CONSTRUCTION.

(1) METAL DUCTS. All sheet metal ducts, duct liners and fittings shall be constructed in compliance with standards approved by the department.

Quote from the U.S. Department of Health Human Services AIA Standard 673:

"4. Use of duct lining is generally discouraged as they increase energy costs by increasing system-pressure drops. Moreover, remodeling of lined duct systems destroys the integrity of the liner sealant. However, if linings are used in nonsensitive hospital areas, they shall meet the erosion test method described in Underwriters' Laboratories, Inc., publication no. 181. These linings (including coatings, adhesives, and exterior surface insulation on pipes and ducts in spaces used as air supply plenums) shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as determined by an independent testing laboratory in accordance with NFPA 255.

"5. Duct linings exposed to air change should not be used in ducts serving operating rooms, delivery rooms, LDR rooms, nurseries, and intensive care units. Where its use cannot be avoided, terminal filters of at least 90 percent efficiency shall be installed downstream of all lining material. This requirement shall not apply to mixing boxes and acoustical traps that have special coverings over such lining."

Note: The department will accept the standards for ducts in the ASHRAE Handbook of Equipment Volume, published by the American Society of Heating, Refrigerating and Air Conditioning Engineers, or as illustrated in the HVAC Duct Construction Standards, Metal and Flexible and HVAC Air Duct Leakage Text Manual as published by the Sheet Metal and Air Conditioning Contractors National Association, Inc.

(2) COMBUSTIBLE DUCTS. All ducts or airways of wood or other combustible building elements shall be lined with sheet metal or other approved noncombustible material unless specifically exempted by this code.

(3) NONMETALLIC DUCTS. Coated metal ducts or ducts constructed of other than metal shall conform to the following:

(a) The method for fabricating, installing and supporting ducts shall be approved by the department;

Note: The department accepts Class 1 air ducts tested (Standards for Safety, UL 181) and listed by Underwriters' Laboratories, Inc., and constructed in accordance with fibrous glass duct construction standards published by the Sheet Metal and Air Conditioning Contractors National Association, Inc.

(b) The ducts shall resist puncture, deformation or collapse;

(c) The ducts shall not be used where the air temperature exceeds 250°F in fume hood exhaust ducts or for kitchen hood supply or exhaust ducts. Nonmetallic or coated metal ducts may be used to convey solids or corrosive gasses if information is provided to show the duct is suitable for the specific use and approval is granted by the department.

(d) The ducts shall not pass through required fire-resistive construction.

Nonmetallic flexible duct which has passed the required UL 181 testing will bear a square or rectangular label on its exterior. The label will state that it is an approved flexible air duct. The label will also indicate that the nonmetallic flexible duct is constructed of Class 0 (air duct having surface burning characteristics of zero) or Class 1 (air duct having a flame spread index of not over 25, without evidence of continued progressive combustion, and a smoke developed index of not over 50) materials. Nonmetallic flexible ducts will be allowed in unlimited lengths, but must be clearly labeled by the manufacturer and the pressure loss for the duct must be addressed in the calculations. Nonmetallic flexible ducts may or may not be insulated, however ducts shall be insulated if required by COMM 63.29. Nonmetallic flexible ducts are allowed to be used as part of a clothes dryer exhaust system and as long as the UL listing requirements are adhered to.

(4) ADDITIONAL DUCT SEALING. In addition to requirements of standards specified in sub. (1), where supply ductwork and plenums that are designed to operate at static pressures from 0.25 inches to 2 inches water column inclusive are located outside of the conditioned space or in return plenums, joints shall be sealed in accordance with Seal class C as defined in the SMACNA HVAC Duct Leakage Test Manual. Pressure sensitive tape shall not be used as the primary sealant where such ducts are designed to operate at static pressures of 1 inch water column or greater.

COMM 64.35 DUCT CONNECTORS.

(1) FLEXIBLE DUCT CONNECTORS. Flexible duct connectors between duct systems and air outlets or air outlet units shall conform to the following:

(a) The duct material shall be approved for such use;

Note: Flame-retarded fabric or metal or mineral listed in the Building Materials List, published by Underwriters' Laboratories, Inc., are acceptable.

(b) The construction shall be approved by the department;

(c) The connector shall not be subject to deterioration from mildew or moisture; and

(d) The connector shall not pass through required fire-resistive construction.

A nonmetallic flexible duct connector (also known as an "Air Connector") which has passed the required UL 181 testing will bear a round or oval label on its exterior. The label will state that it is an approved flexible air connector. The label will also indicate that it is constructed of Class 0 (air connectors having surface burning characteristics of zero) or Class 1 (air connectors having a flame spread index of not over 25, without evidence of continued progressive combustion, and a smoke developed index of not over 50) materials. Flexible air connectors may or may not be insulated, however, ducts shall be insulated if required by COMM 63.29 (See also Table 63.29-2 Note f). UL listings limit flexible air connectors to be not more than 14 feet in length. Flexible air connectors are not required to pass a 30 minute flame penetration test, puncture test or 15 lb. impact test. UL requires that an air connector label state, "For installation in lengths not over 14 ft" or similar wording. Flexible air connectors are NOT allowed to be used as part of a clothes dryer exhaust system

(2) VIBRATION CONTROL. Vibration isolation connectors at the joint between the duct and fan or heat-producing equipment shall conform to the following:

(a) Connectors shall be a type approved for such use;

Note: Flame-retarded fabric or metal or mineral listed in the Building Materials List, published by Underwriters' Laboratories, Inc., are acceptable.

(b) Connectors shall be not more than 10 inches wide; and

(c) Connectors shall not be used where the air temperature is in excess of 250°F.

COMM 64.36 VERTICAL SHAFTS.

Every vertical shaft shall be enclosed with noncombustible material which is fire-resistive rated in accordance with Table 51.03-A.

COMM 64.37 INSULATION.

Heating supply ducts and pipes shall be covered with insulation unless an allowance is made for temperature drop in the system.

Note: Also see s. COMM 63.29 for additional requirements.

COMM 64.38 GRAVITY VENTILATION DUCTS.

(1) DESIGN. Horizontal runs in gravity ventilation ducts connected to siphon-type roof ventilators shall be avoided wherever possible and the maximum practicable inclination shall be provided in all cases. In no case shall the horizontal run exceed 30% of the vertical run unless the room has a mechanical supply of air or the ventilation duct is connected to an exhaust fan.

(2) SEPARATE DUCTS. Separate gravity ventilation ducts, from each area of similar occupancy, shall extend to a plenum at the base of a siphon ventilator.

(3) PLENUMS. Gravity ventilation ducts, used with mechanical ventilation supply systems, shall not terminate in an attic plenum unless the plenum is airtight, of noncombustible construction, and the attic floor is smooth. All collecting plenums shall be connected to an approved siphon-type roof ventilator or to an exhaust fan discharging outside the building.

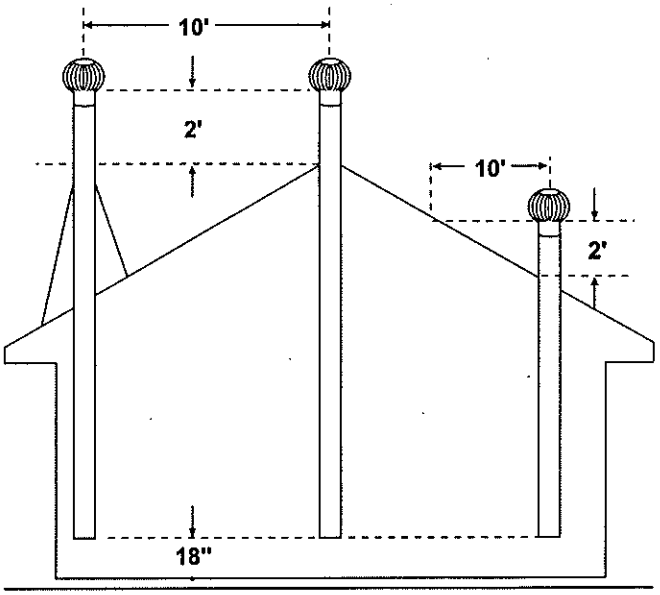
(4) DAMPERS. Dampers are prohibited in gravity ventilation ducts, except atmospheric back-draft dampers are permitted.

COMM 64.39 VENTILATION DISCHARGE.

All gravity and mechanical ventilation ducts shall be protected from the weather and shall be located and constructed to prevent contamination of an outside air supply. Gravity ventilation ducts shall extend not less than 2 feet above the highest portion of the building within a 10-foot radius of the duct and shall be provided with an approved type of siphon roof ventilator.

Gravity ventilation ducts must extend 2 feet above the highest portion of the roof within a 10-foot radius of the duct. Where the gravity ventilation duct is placed on a lower roof of a building with several roof levels, the duct shall be at least 10 feet from any wall.

VENTILATION DUCTS, COMM 64.39



COMM 64.40 RELIEF VENTS.

(1) BAROMETRIC RELIEF VENTS PERMITTED. The use of barometric relief vents is permitted for type (a) and (b) ventilation classifications designated in s. COMM 64.05. Where

barometric relief vents are installed on the roof, the discharge openings shall be not less than 2 feet above the roof surface where the vent pierces the roof.

(2) BAROMETRIC RELIEF VENTS PROHIBITED. The use of barometric relief vents is prohibited for type (c), (d) and (e) ventilation classifications designated in s. COMM 64.05.

COMM 64.41 PLENUMS.

(1) GENERAL. Plenums used for the supply, return or transfer of air shall be of noncombustible construction.

(a) *Exception.* Combustible ceiling materials may be used provided they comply with the following:

1. The ceiling material is made from a base material of metal or mineral;

2. All surfaces of ceiling material possess a flame-spread rating of not over 25 without evidence of continued progressive combustion and with a smoke-developed rating of not higher than 50;

3. The ceiling material is supported by noncombustible material having a melting point above 1400°F. (760°C); and

4. The ceiling material is not subject to deterioration or deformation on long exposure to temperatures of 250°F. (121°C) or under conditions of high humidity, excessive moisture, or mildew.

(b) *Ceiling systems with fire-resistive ratings.* Return air plenums shall not be placed in rated ceiling systems unless specifically allowed by the listing.

Note #1: This section permits the use of steel, painted steel bar joists and metal decking, concrete, plaster, and other noncombustible materials and restricts the use of certain combustible materials within air-handling plenums.

Note #2: The requirements for ceiling materials are based upon the National Fire Protection Association (NFPA) standard 90A, section 2-2.1.3.

(2) DUCTWORK WITHIN THE PLENUM. Ducts within the plenum shall be constructed of metal in accordance with s. COMM 64.34 (1) or approved nonmetallic materials in accordance with s. COMM 64.34 (3).

(3) DUCT CONNECTORS. Duct connectors shall comply with the requirements of s. COMM 64.35.

Note: Flame-retardant fabric or metal or mineral listed in the Building Materials List, published by Underwriters' Laboratories, Inc., are acceptable.

(4) INSULATING MATERIALS WITHIN THE PLENUM.

(a) *Duct and pipe insulation.* Duct and pipe insulation, including coverings, linings, tapes and core materials, shall have a flame-spread rating of not over 25 without evidence of continued progressive combustion, and a smoke-developed rating no higher than 50 when tested according to ASTM E-84 standard tests.

Note: If coverings and linings are to be applied with adhesives, they shall be tested as applied with such adhesives, or the adhesives used shall have a flame-spread rating not over 25 and a smoke-developed rating no higher than 50 when in the final dry state.

(b) *Building envelope insulation.* Building envelope insulation within the plenum space shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less when tested according to ASTM E-84 test standards. The use of foam plastics, satisfying the

requirements of s. COMM 51.06, for envelope insulation is permitted provided the foam plastic is protected by a thermal barrier as specified in s. COMM 51.06 (3).

(5) HAZARDOUS PIPING. The installation of hazardous piping as defined in s. COMM 51.01 (102) is prohibited in the plenum space, except as permitted under NFPA 54.

See 51.01 (102) Commentary allowing the piping of oxygen gas and nitrous oxide gas.

(6) OPENINGS. Openings into the plenum that would affect the fire-resistive rating of the structural component or system are prohibited.

(7) WIRING AND CABLES. Electric wiring, including low-voltage wiring, and telephone cables within the plenum space shall be installed according to the Wisconsin State Electrical Code, Vol. 2, ch. COMM 16.

(8) PLUMBING. Plumbing within the plenum shall be of noncombustible material.

(a) *Exception.* Plastic plumbing pipe and fittings may be used provided the plastic material is of the self-extinguishing type with an average extent of burn not greater than 10 mm and an average time of burn not greater than 20 seconds when tested according to ASTM D-635. The plastic material shall be wrapped with at least one inch of noncombustible insulation or enclosed with 1/2 inch type X gypsum wallboard.

This section permits the installation of plastic plumbing pipe and fittings provided the plastic is "self-extinguishing" with an average extent of burn of not greater than 10 millimeters and an average time of burn of not greater than 20 seconds when tested in accordance with ASTM D-635. PVC plastic plumbing pipe typically comes stamped as conforming to ASTM Standard D-2665 or D-1785 with no reference made to Standard D-635 as specified in subsection (8)(a). In reviewing the product standards under ASTM D-2665 and D-1785, it was determined that compliance with ASTM D-635 is a criteria for listing under the other two ASTM Standards. Therefore, if the PVC plastic plumbing pipe is stamped as meeting ASTM Standards D-1785 or D-2665, it automatically meets the requirements for ASTM D-635 and is eligible for installation under the exceptions specified in section COMM 64.41 (8)(a).

(9) CONTROL TUBING. Plastic control tubing shall have an average extent of burn not greater than 10 mm and an average time of burn not greater than 20 seconds when tested according to ASTM D-635.

(10) SMOKE DETECTION.

(a) *New construction.* Air-handling plenums which contain ductwork, duct connectors, insulation, plumbing or control tubing which do not meet the requirements of subs. (2) to (4), (8) and (9), respectively, shall be provided with an approved smoke detection system capable of stopping the air flow in and from the plenum and giving an audible alarm in the occupied area when activated.

(b) *Existing construction.* When existing plenum construction contains combustible insulation, wiring, plumbing or control tubing, and is altered or added to according to s. COMM 50.03 (1) or (2), the entire plenum space, new and existing, shall be provided with a smoke detection system according to sub. (10)(a).

1. Exception. Building additions separated from existing construction by one-hour noncombustible construction need not be provided with a smoke detection system provided the plenum is constructed according to subs. (1) to (8).

COMM 64.42 FIRE DAMPERS AND CEILING DAMPERS.

(1) REQUIRED FIRE DAMPERS AND CEILING DAMPERS. All heating and ventilating ducts, except underground ducts used with counterflow or downflow heating equipment, which terminate at or pierce code-required, hourly rated wall, floor, floor ceiling assemblies, roof ceiling assemblies, and membrane finishes used as a substitution for rated assemblies shall be protected as follows:

Also, see COMM 51.047and 51.049.

(a) Penetrations to assemblies having fire resistance ratings of less than 3-hours shall be protected by fire dampers having at least a 1 1/2 hour rating.

(b) Penetration to assemblies having fire resistance ratings of 3-hours or more shall be protected by fire dampers having at least a 3 hour rating.

(c) Penetrations to membranes whose finish ratings are used as a substitution for hourly rated assemblies shall be protected in the same manner specified in (a) and (b). The exception found in (2)(c) cannot be used in this situation.

(2) EXCEPTIONS. Exceptions to sub. (1) are:

(a) Penetrations in 1-hour rated wall assemblies, other than required shaft enclosures, which are provided with continuous horizontal steel ductwork extending, unpierced, at least 6-feet horizontally on at least one side of the wall and the ductwork leads to an air handling device.

Note: See ss. COMM 51.02(11), 54.08, 55.09, 55.20, 56.10, 57.08, 58.06, 58.23, 58.50, 58.61, 59.17, 60.34, 61.12, and 62.27 for information on when fire resistive rated shafts are required.

Question: *Does 64.42 (2)(a) mean that steel ductwork may be utilized in lieu of a required 1-hour fire-rated shaft enclosure?*

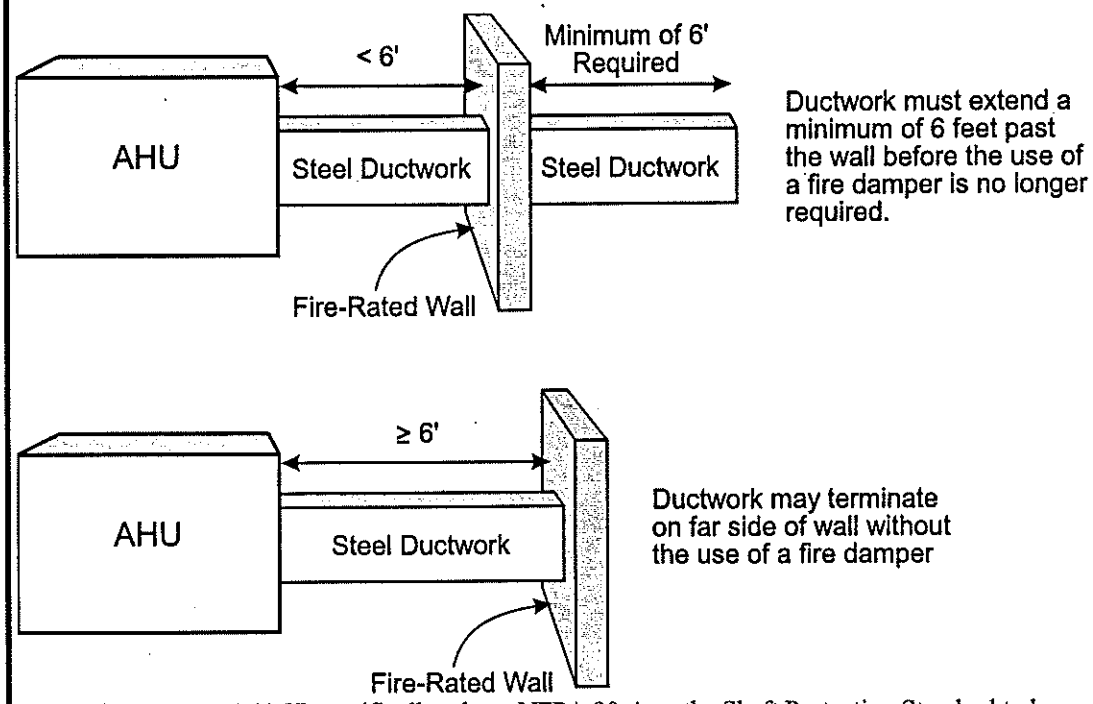
Analysis: *COMM 51.02 (11) requires the protection of vertical openings between floor levels unless an exception in (b) or the occupancy chapter is met.*

COMM 64.42 deals with the protection of openings in fire-rated assemblies required for class-of-construction purposes, protection of openings into rated enclosures such as shaft enclosures required by 51.02 (11), and isolation of hazard enclosures, etc.

The subject of COMM 64.42 is the use and installation of fire dampers and fire curtain doors where other sections of the code require fire-rated assemblies.

Answer: *No, if 51.02 (11) requires a rated shaft, the appropriate fire-resistive rating from Line 20, Table 51.03-A, or more restrictive occupancy chapter requirements must be provided. Penetrations into 1-hour rated shafts may be protected by utilizing steel ductwork in accordance with 64.42 (2)(a) in lieu of fire dampers.*

Rated wall assemblies may be pierced by steel ductwork without requiring fire dampers, providing the steel ductwork extends at least 6 feet from the wall and is connected directly to the air handling unit. See the diagram below for examples of how to apply this section. This does not apply to shafts or vertical penetrations between floor levels. See COMM 51.02 (11) and 51.042 commentary for requirements for shaft protection



Caution: COMM 64.57 specifically adopts NFPA 90-A as the Shaft Protection Standard to be applied to Health Care Facilities. NFPA 90-A does not allow the 6 feet of steel ductwork in lieu of fire dampers.

(b) Interior bearing walls and partitions if other unprotected openings are permitted by other sections of COMM 50 through 62.

(c) Air supply, exhaust or return outlet, grille and diffuser penetrations to the ceiling membranes of fire resistance rated floor ceiling assemblies or roof ceiling assemblies which meet one of the following:

Question: *Is a fire damper required between a fire rated room necessary for isolation of hazards and a mechanical shaft protected with the same fire-resistive rating?*

Answer: *No. If the isolated room and the shaft entering this room are both constructed utilizing the more restrictive code required fire rating, the shaft may be considered an extension of the isolated room, thus a fire damper separation is not required. Fire dampers are required at other penetrations in the shaft or room unless otherwise exempted.*

1. Any assembly which has been tested by an approved nationally recognized testing laboratory and has all penetrations protected as required by the assembly as tested.

Note: See s. COMM 51.04 to 51.044 and Appendix A for information on fire-resistive assemblies and approved testing laboratories.

2. Diffuser and grille penetrations to the ceiling membranes of fire-resistive floor ceiling assemblies or roof ceiling assemblies meeting the requirements of s. COMM 51.045 provided the openings are limited to 100 square inches for each 100 square feet of ceiling area, the individual openings do not exceed an area of 100 square inches, and the openings are protected by one of the following:

a. Listed ceiling dampers.

Note : Ceiling dampers are classified for use in air handling openings penetrating fire resistive membrane ceilings. Ceiling dampers listed by U.L. use standard UL 555C, "Ceiling Dampers" for investigation of products.

b. Duct outlet protection systems which have been tested and listed by an approved nationally recognized testing laboratory.

Note: The General Information Section of the U.L. Fire Resistance Directory includes descriptions and details for duct outlet protection systems A and B which are both examples of acceptable protection.

(d) Kitchen exhaust ducts meeting all requirements of s. COMM 64.57(5).

The reference for kitchen exhaust ducts is not listed correctly above. COMM 64.67(5) is the proper reference.

(3) SERVICING FIRE DAMPERS. Access panels shall be provided next to fire dampers to permit viewing and servicing.

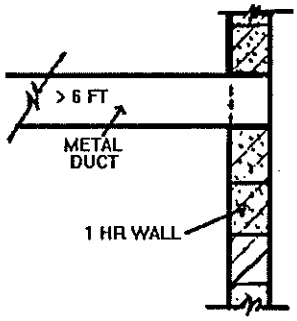
Note #1: The department will accept fire dampers listed by Underwriters Laboratories Inc. or an approved nationally recognized testing laboratory. Fire dampers listed by U.L. use standard UL 555, "Fire Dampers" for investigation of products. The dampers must be installed in the vertical or horizontal position that the dampers were designed and tested for . The department will accept fire damper installations as recommended in publications of the Sheet Metal, Air Conditioning Contractors National Association, Inc., and the National Fire protection Association.

Note #2: Fire dampers are classified as 1 1/2 hour rated or 3 hour rated .

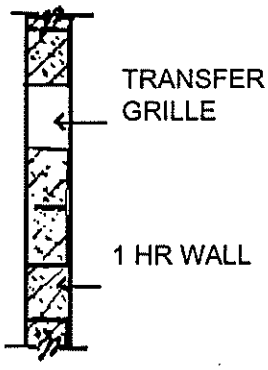
Note #3: Health care facilities may have additional requirements, see s. COMM 64.57

COMM 64.42 FIRE DAMPERS AND FIRE CURTAIN DOORS.

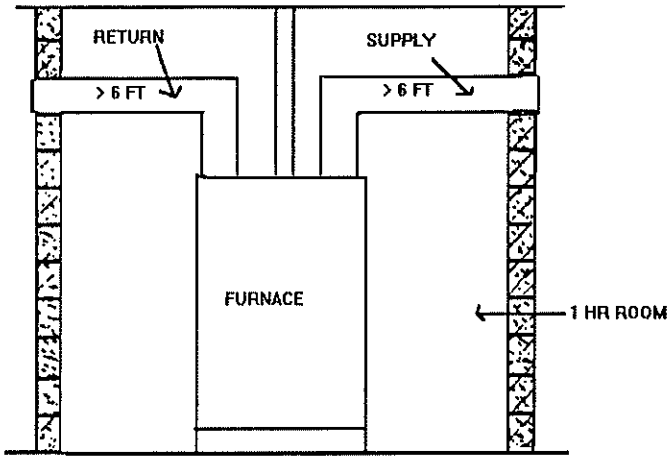
See figure below for applications of one-hour rated walls.



NO FIRE DAMPER REQUIRED



FIRE DAMPER REQUIRED



NO FIRE DAMPER REQUIRED

COMM 64.43 DAMPERS AND DAMPER CONTROLS.

(1) VOLUME DAMPERS AND DEFLECTORS. Volume dampers, splitters and deflectors shall be provided in all ducts to permit accurate balancing of the system. The dampers, splitters and deflectors shall be adjusted to satisfy the heating and ventilating requirements of the conditioned space and locked in place.

Dampers installed in diffusers are NOT acceptable as volume dampers.

(2) AIR GRILLES. All air supply outlets and returns shall be equipped with grilles or devices which will provide a uniform distribution of air.

COMM 64.44 FANS AND BLOWERS.

Fans and blowers shall be of a type and size that will satisfy the design conditions of the heating and ventilating system. Fans and blowers shall be rated in accordance with an approved test procedure.

Note: The department accepts certified ratings listed by the Air Moving and Conditioning Association, Inc.

Subchapter VI -- Chimneys, Gas Vents, Mechanical Draft and Venting Devices

COMM 64.45 CHIMNEYS, SMOKE STACKS, GAS VENTS, MECHANICAL DRAFT AND VENTING DEVICES.

(1) GENERAL REQUIREMENTS. Heating equipment using solid, liquid or gas fuels shall be vented to the outside, except as permitted in s. COMM 64.21. A natural draft chimney or other venting device shall have the height and area to remove the products of combustion. Chimneys, smoke stacks, gas vents, mechanical draft and venting devices shall comply with the requirements of NFPA 211.

(2) NONCOMBUSTIBLE SUPPORTS. All chimneys or gas vents shall be supported from noncombustible construction unless otherwise approved.

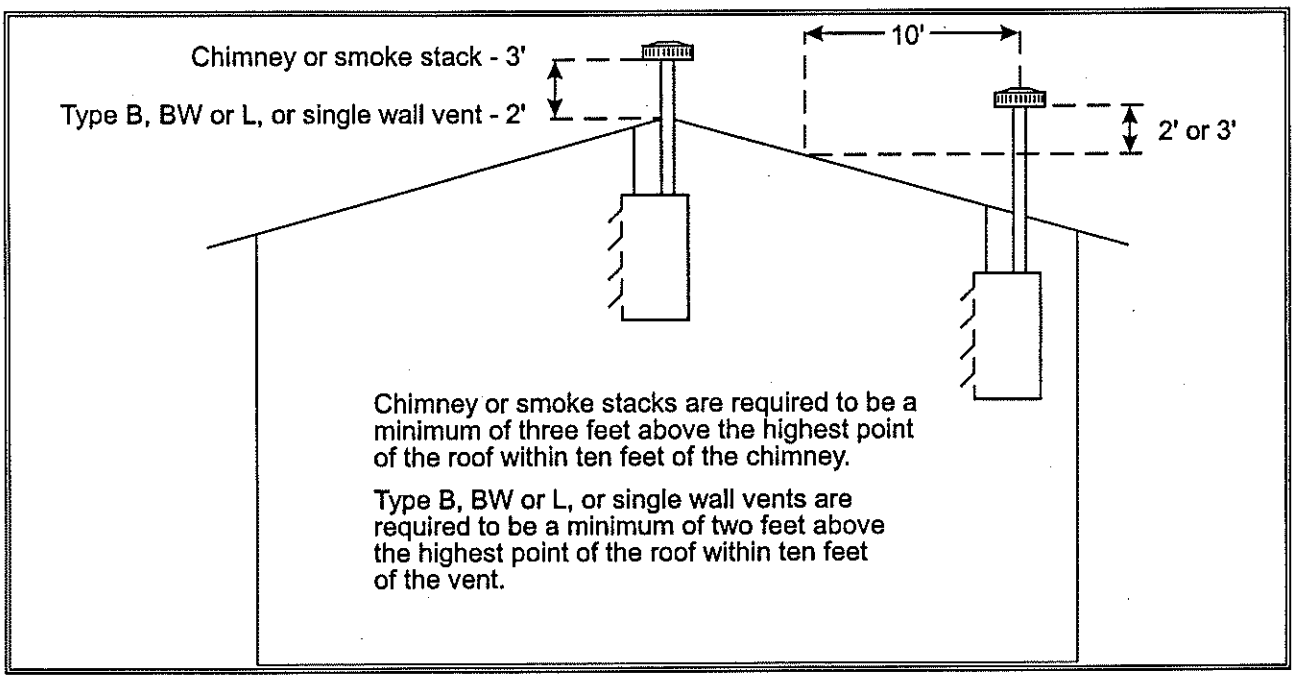
(3) TERMINATION.

(a) *Gravity type.*

1. All chimneys or smokestacks depending on a gravity principle for the removal of the products of combustion shall extend at least 3 feet above the highest point of the roof where the chimneys or smokestacks pass through the roof of the building, and at least 2 feet higher than any portion of the building measured 10 feet horizontally from the chimney or smokestack.

2. Type "B", "BW" and "L" vents and single wall vent pipes depending on a gravity principle for the removal of the products of combustion shall extend at least 2 feet above the highest point of the roof where the vents or pipes pass through the roof of the building, and at least 2 feet higher than any portion of the building measured 10 feet horizontally from the vent or pipe.

(b) *Mechanical type.* The height and cross-sectional area may be reduced for chimneys employing a mechanical draft system of either forced or induced draft when approved by the department.



COMM 64.46 MASONRY CHIMNEYS.

The design and construction of the chimney shall conform to the provisions of this section.

(1) **MATERIALS.** The walls shall be built of brick or other approved fire-resistive material. No chimney shall rest upon a flooring of wood nor shall any wood be built into or in contact with any chimney. Combustible headers, beams, joists and studs shall be located at least 2 inches from the outside face of a chimney. The foundation shall be designed and built in conformity with the requirements for foundations for buildings. In no case shall a chimney be corbeled out more than 6 inches from the wall and in every case the corbeling shall consist of at least 5 courses of brick.

(2) **FLUE SIZE.** Every masonry chimney shall have walls at least 8 inches in solid thickness, except that in a chimney with a flue not larger than 260 square inches where a fire clay or other suitable refractory clay flue lining is used for the full height of the chimney the walls shall not be less than 4 inches in solid thickness. No smoke flue shall have a cross-sectional area less than 64 square inches. Flue linings 7 inches by 7 inches inside, or 8 inches in diameter inside, may be used.

(3) **FLUE LININGS.** All flue linings shall be capable of withstanding reasonably high temperatures and flue gases and shall have a softening point not lower than 1800°F. Flue linings shall be not less than 5/8 inch in thickness and shall be built in as outer walls of the chimney are constructed. Flue linings shall start from a point not less than 8 inches below the bottom of the smoke pipe intake and shall be continuous to a point not less than 4 inches above the enclosing walls.

(4) **SMOKE PIPE CONNECTION.** If there is more than one smoke pipe connected to a flue, the connections shall be at different levels. Two or more heating units, or appliances, may be connected to a common smoke pipe, or breeching, if joined by Y fittings as close as practicable to the flue. In all such cases, the size of the breeching and the flue shall be sufficient to accommodate the total volume of flue gases.

(5) CLEAN-OUT OPENING. Every chimney shall be provided with a clean-out opening at the base. Such openings shall be equipped with metal doors and frames arranged to remain closed when not in use.

(6) WIND PRESSURE. Every chimney shall be designed to withstand wind pressures in accordance with the requirements of s. COMM 53.12.

COMM 64.47 METAL SMOKESTACKS.

(1) SMOKESTACKS IN EXCESS OF 30 FEET. The thickness of the metal walls shall be at least 3/16 inch for smokestack heights up to 40 feet and 1/4 inch for greater heights. Stacks used for manufacturing, high-pressure boilers, furnaces or other similar heating or manufacturing appliances shall be lined with firebrick, or equivalent, for a distance of not less than 25 feet from the place where the smoke pipe enters and shall be protected on the outside up to and through the roof of the building with 8 inches of masonry, or a metal shield which provides an 8-inch ventilated air space between such shield and the stack. All stacks shall be properly guyed if the height of the stack exceeds 15 times its least diameter.

(a) *Exception.* Public utility or industrial power plants are exempted from the protection requirements of this paragraph if they are of type 1 or 2 construction.

(2) SMOKESTACKS LESS THAN 30 FEET. Smokestacks less than 30 feet high may be constructed of not less than No. 10 U.S. gauge steel, with either welded or riveted joints, and may be mounted directly upon masonry chimneys or foundations or upon industrial heating or power boilers provided all of which are designed to support the stack load. A clearance of not less than 6 inches shall be maintained at all times around such smokestacks and any combustible material within 12 inches of such smokestacks shall be protected by noncombustible insulation covered by sheet metal.

COMM 64.48 FACTORY-BUILT CHIMNEYS AND GAS VENTS.

(1) GENERAL. Factory-built chimneys and gas vents shall be of an approved type.

(2) TYPES OF APPROVED CHIMNEYS AND GAS VENTS.

(a) *Residential type and building heating appliance.* An approved "residential type and building heating appliance" chimney or "building heating appliance" chimney may be used with solid-, liquid- or gas-fired heating appliances where the flue gas temperature does not exceed 1000° F. continuously, and does not exceed 1400°F. for infrequent brief periods of forced firing.

Note: Residential type and building heating appliance chimneys were formerly referred to as Class A chimneys.

(b) *Type "B".* An approved type "B" gas vent may be used with gas-fired appliances where the flue gas temperature does not exceed 550°F. at the outlet of the draft hood.

(c) *Type "BW".* An approved type "BW" gas vent may be used with a vented recessed wall heater.

(d) *Single wall vent pipe.* An approved single wall vent pipe may be used with gas-fired, low-heat appliances (low-pressure boilers, furnaces and space heaters). The vent shall be not less than No. 20 standard gauge galvanized iron, No. 24 Brown and Sharpe gauge sheet copper, or other approved corrosion-resistant material. The installation shall conform to the requirements of s. COMM 64.50.

(e) *Type "L".* An approved type "L" vent may be used with oil-fired appliances listed as suitable by a recognized agency and with gas-fired appliances approved for type "B" vents.

(f) *Equipment listed with venting system.* Venting systems included with the listing of the heating appliance may be used subject to the requirements and limitations of the listing.

Note: The department recognizes, as approved, chimneys designated as "residential type", "building heating appliance", "B", "BW" and "L" types listed by Underwriters' Laboratories, Inc.

COMM 64.49 GAS VENTS.

All gas ranges (except those designed as unvented), water heaters and other gas-fired equipment shall be provided with vent pipes conforming to the requirements for gas vents as specified in s. COMM 64.48 and for connectors as specified in s. COMM 64.50. Commercial kitchen appliances including but not limited to ranges, ovens, booster heaters and similar equipment may be vented into the kitchen hood exhaust system.

COMM 64.50 CHIMNEY AND VENT CONNECTORS.

(1) CONSTRUCTION AND INSTALLATION. The construction and installation of chimney connectors shall conform with the following requirements:

(a) *Concealed space.* No chimney connector shall pass through any outside window, door or combustible outside wall, nor be concealed in any closet, attic or similar space;

(b) *Combustible partitions and walls.* Connectors for appliances shall not pass through interior walls or partitions constructed of combustible material unless they are guarded at the point of passage by:

1. Metal ventilated thimbles not less than 12 inches larger in diameter than the connector, or

2. Metal or burned fireclay thimbles built in brickwork or other approved fireproofing materials extending not less than 8 inches beyond all sides of the thimble;

(c) *Distance from materials.* Connectors shall be installed with clearance to combustibles specified in par. (b) or NFPA Standard 211;

(d) *Multiple appliance venting.*

1. Two or more appliances using the same type of fuel may be connected to a common gravity-type chimney or vent, provided the appliances are equipped with primary safety controls and listed shutoff devices and comply with the following requirements:

a. The appliances shall be located in the same story, except for engineered venting systems;

b. The appliances shall be joined at a manifold or Y-type fitting as close to the chimney or vent as possible, unless the connector from each appliance enters a separate chimney or vent inlet and the inlets are offset at least 12 inches vertically or are at right angles to each other;

c. The connector and chimney or vent shall be sized to accommodate the total volume of flue gases. For gas-burning appliances, the venting area shall be at least equal to the size of the largest vent connector plus at least 50% of the area of the other vent connectors; or

d. A chimney serving a fireplace or other piece of solid-fuel equipment shall not be used to vent any other appliance;

Note: Engineered venting systems designed in accordance with NFPA 54, "National Fuel Gas Code" are acceptable to the department.

2. Gas utilization appliances and appliances burning liquid fuel may be connected to one chimney flue in accordance with NFPA 211.

(e) *Pitch and length.* Chimney or vent connectors shall have no more than two 45° offsets with the vertical. The horizontal length shall not exceed 75% of the total vertical height of the total venting system measured from the appliance outlet. Chimney or vent connectors shall be pitched up at least 1/4 inch per foot from the appliance outlet collar to the chimney or vent inlet;

(f) *Dampers.* A manual cast iron or equivalent damper to control the draft shall be provided in the chimney connector next to solid-fuel fired equipment. Manually operated dampers shall be prohibited in chimney or vent connectors of all other appliances. When used, listed automatically operated dampers interlocked with the heating appliance shall be installed in accordance with the approved listing; and

When retrofitting wood-burning fireplaces for gas logs, the manual damper must be removed.

(g) *Materials and thickness.*

1. Except as specified in subd. 2., chimney or vent connectors shall be listed or conform to the type of material and thickness indicated in Table 64.50 or equivalent.

2. Exception. Connectors serving listed residential-type gas appliances shall be not less than .016 inch galvanized steel.

TABLE 64.50

MINIMUM CHIMNEY CONNECTOR METAL THICKNESS

Galvanized Steel		
Diameter of Connector	Minimum Thickness (inch)	Gauge
Less than 6 inches	.019	26
6 inches to less than 10 inches	.024	24
10 inches to 13 inches	.030	22
14 inches to 16 inches	.036	20
Greater than 16 inches	.058	16

Also see NFPA 54 for additional guidelines.

Subchapter VII -- Equipment Location, Protection, Maintenance and Operation

COMM 64.51 GUARDING AND FIRE PROTECTION.

(1) GUARDING OF EQUIPMENT. Heating and ventilating equipment in gymnasiums, playrooms and similarly occupied areas shall be fully recessed and protected, or located not less than 7 feet above the floor. Heating and ventilating equipment shall not block any part of the required aisles, passageways and corridors.

(2) GUARDING OF SURFACES.

(a) Equipment located in occupied areas and installed less than 7 feet above the floor shall be guarded to prevent contact with surfaces that are likely to cause lacerations.

(b) Surfaces that are located less than 7 feet above the floor that exceed 180°F in temperature shall be covered with insulating material or be guarded.

(3) GUARDING OF MECHANICAL APPARATUS. All mechanical apparatus shall be guarded to comply with the requirements of ch. Comm 32—Safety and Health Standards for Public Employees.

(4) FIRE PROTECTION.

(a) 1. Heat-producing appliances and their chimney or vent connectors shall be installed with clearances to combustible material as specified in NFPA Manual No. 211 unless listed for installation at other clearances.

2. Clearance to combustible materials shall be as specified in NFPA Standard No. 211 or as specified by a nationally recommended testing laboratory, whichever is greater.

(b) Clearances shall be measured from the outer surface of the appliance or connector to the combustible material, disregarding any intervening protection applied to the combustible material.

(c) Appliances shall not be installed in alcoves or closets unless approved for such installations.

The following pages are included from NFPA 211 referencing the clearance to combustibles for chimney connectors and solid fuel burning appliances and the reduction allowed with specified forms of protection.

5-5.1.1 Clearances from connectors to unprotected combustible material shall be in accordance with Table 5-5(a) and Figure 5-5.

Table 5-5(a) Chimney Connector and Vent Connector
Clearances from Combustible Materials

Description of Appliance	Minimum Clearance, in. (mm) (See Note 1)	
Residential-Type Appliances		
Single-wall metal pipe connectors		
Gas appliances without draft hoods	18	(457)
Electric, gas, and oil incinerators	18	(457)
Oil and solid-fuel appliances	18	(457)
Unlisted gas appliances with draft hoods	9	(229)
Boilers and furnaces equipped with listed gas burners and with draft hoods	9	(229)
Oil appliances listed as suitable for use with Type L vents	9	(229)
Listed gas appliances with draft hoods (See Note 3)	6	(152)
Type L vent piping connectors		
Gas appliances without draft hoods	9	(229)
Electric, gas, and oil incinerators	9	(229)
Oil and solid-fuel appliances	9	(229)
Unlisted gas appliances with draft hoods	6	(152)
Boilers and furnaces equipped with listed gas burners and with draft hoods	6	(152)
Oil appliances listed as suitable for use with Type L vents		(See Note 2)
Listed gas appliances with draft hoods		(See Note 3)
Type B gas vent piping connectors		
Listed gas appliances with draft hoods		(See Note 3)
Low-Heat Appliances		
Single-wall metal pipe connectors		
Gas, oil, and solid-fuel boilers, furnaces, and water heaters	18	(457)
Ranges, restaurant type	18	(457)
Oil unit heaters	18	(457)
Unlisted gas unit heaters	18	(457)
Listed gas unit heaters with draft hoods	6	(152)
Other low heat industrial appliances	18	(457)
Medium-Heat Appliances		
Single-wall metal pipe connectors		
All gas, oil, and solid-fuel appliances	36	(914)
High-Heat Appliances		
Masonry or Metal Connectors		
All gas, oil, and solid-fuel appliances		(See Note 4)

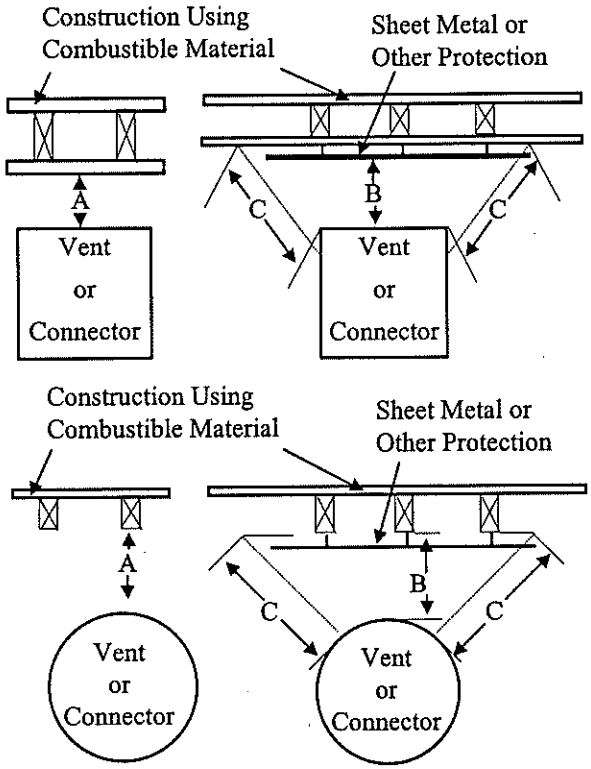
Notes to Table 5-5(a)

Note 1: These clearances apply except if the listing of an appliance specifies different clearance, in which case the listed clearance takes precedence.

Note 2: If listed Type L vent piping is used, the clearance may be in accordance with the vent listing.

Note 3: If listed Type B or Type L vent piping is used, the clearance may be in accordance with the vent listing.

Note 4: Clearances shall be based on good engineering practice and acceptable to the authority having jurisdiction. The clearances from connector to combustible materials may be reduced if the combustible material is protected in accordance with Table 5-5(b).



A equals the required clearance with no protection.

B equals the reduced clearance permitted.

The protection applied to the construction using combustible material shall extend far enough in each direction to make C equal to A.

Figure 5-5 Extent of Protection Required to Reduce Clearances from Chimney or Vent Connectors.

5-5.1.2 Clearances from connectors to combustible material may be reduced if the combustible material is protected by an engineered protection system acceptable to the authority having jurisdiction, or by the use of materials or products listed for protection purposes, or in accordance with Table 5-5(b) and Figure 5-5.

5-5.2 Engineered systems installed for protection of combustible materials shall reduce the temperature rise of such materials to 90°F (50°C) above ambient. System design shall be based on applicable heat transfer principles taking into account the geometry of the system, the heat loss characteristics of the structure behind the combustible material, and possible abnormal operating conditions of heat-producing sources.

5-5.3 All clearances shall be measured from the outer surface of the connector to the combustible material, disregarding any intervening protection applied to the combustible material, but in no case shall the clearance be such as to interfere with the requirement for accessibility.

5-5.4 Materials and products listed for the purpose of reducing clearance to combustibles shall be installed in accordance with the conditions of the listing and the manufacturer's instructions.

5-5.5 For clearance reduction systems using an air space between the combustible wall and the wall protector.

Table 5-5(b) Reduction of Connector Clearance with Specified Forms of Protection [1,2,3,4,5,6,7,8]

Clearance reduction applied to and covering all combustible surfaces within the distance specified as required clearance with no protection [see section 5-5.1 and Table 5-3(a)].	Maximum allowable reduction in clearance (percent).		When the required clearance with no protection is 18 in., the clearances below are the minimum allowable clearances. For other required clearances, calculate minimum allowable clearance from maximum allowable reduction.[8]	
	As Wall Protector	As Ceiling Protector	As Wall Protector	As Ceiling Protector
(a) 3 1/2 in. (90 mm) thick masonry wall without ventilated air space.	33%	---	12/305	---
(b) 1/2 in. (13 mm) thick noncombustible insulation board over 1 in. (25 mm) glass fiber or mineral wool batts without ventilated air space.	50%	33%	9/229	12/305
(c) 0.024 in./0.61 mm (24 gage) sheet metal over 1 in. (25 mm) glass fiber or mineral wool batts reinforced with wire, or equivalent, on rear face with ventilated air space.	66%	50%	6/152	9/229
(d) 3 1/2 in. (90 mm) thick masonry wall with ventilated air space.	66%	---	6/152	---
(e) 0.024 in./0.61 mm (24 gage) sheet metal with ventilated air space.	66%	50%	6/152	9/229
(f) 1/2 in. (13 mm) thick noncombustible insulation board with ventilated air space.	66%	50%	6/152	9/229
(g) 0.024 in./0.61 mm (24 gage) sheet metal with ventilated air space over 0.024 in./0.61 mm (24 gage) sheet metal with ventilated air space.	66%	50%	6/152	9/229
(h) 1 in. (25 mm) glass fiber or mineral wool batts sandwiched between two sheets 0.024 in./0.61 mm (24 gage) sheet metal with ventilated air space.	66%	50%	6/152	9/229

[1] Spacers and ties shall be of noncombustible material. No spacers or ties shall be used directly behind appliance or connector.

[2] With all clearance reduction systems using a ventilated air space, adequate air circulation shall be provided as described in 5-5.5. There shall be at least 1 in (25 mm) between the clearance reduction system and combustible walls and ceilings for clearance reduction systems using a ventilated air space

[3] Mineral wool batts (blanket or board) shall have a minimum density of 8 lb per ft^3 (128.7 kg./m^3) and have a minimum melting point of 1500° F (816 ° C).

[4] Insulation material used as part of clearance reduction system shall have a thermal conductivity of 1.0 (Btu-in)/(sq. ft.-hr.°F) or less. Insulation board shall be formed of noncombustible material.

[5] If a single wall connector passes through a masonry wall used as a wall shield, there shall be at least 1/2 in. (13 mm) of open, ventilated air space between the connector and the masonry

[6] There shall be at least 1 in. (25 mm) between the connector and the protector. In no case shall the clearance between the appliance and the wall surface be reduced below that allowed in the table.

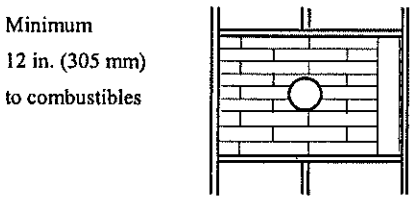
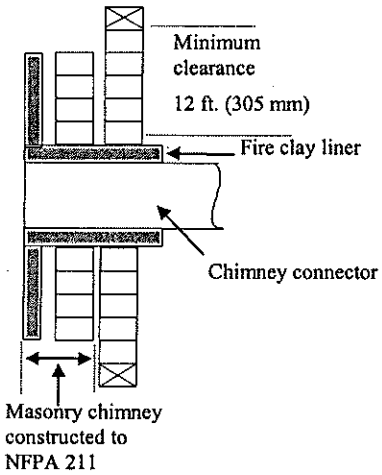
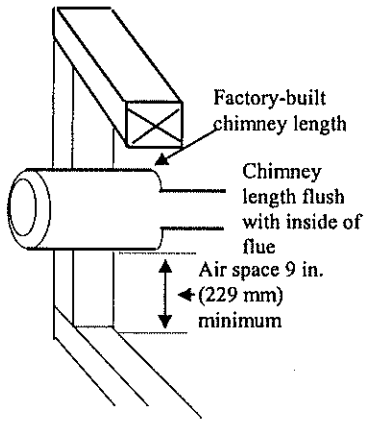
[7] All clearances and thicknesses are minimum; larger clearances and thicknesses are acceptable.

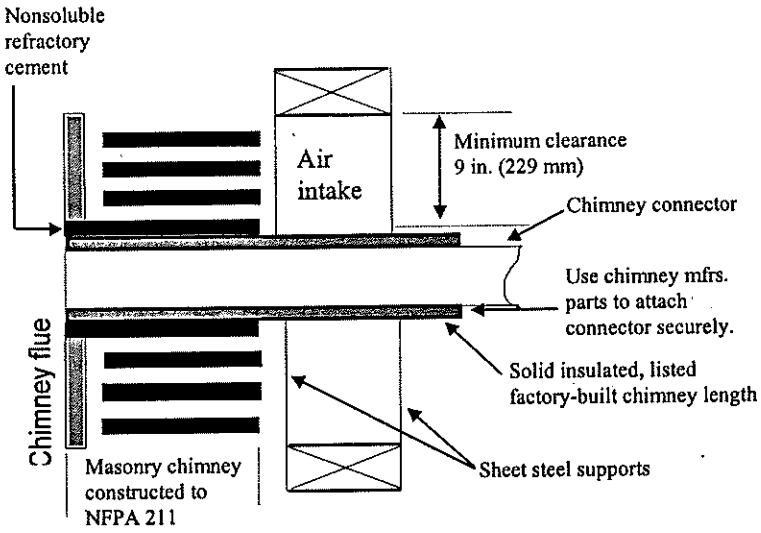
[8] To calculate the minimum allowable clearance, the following formula may be used:

$C_{pr} = C_{un} \times (1\text{-}R/100)$.

C_{pr} is the minimum allowable clearance, C_{un} is the required clearance with no protection, and R is the maximum allowable reduction in clearance.

Connector Systems and Clearances from Combustible Walls for Residential Heating Appliances

	System		Clearance in/mm
Minimum chimney clearance to brick and combustibles 2 in. (51 mm) 	A	Minimum 3.5-in. (90 mm) thick brick masonry wall framed into combustible wall with a minimum of 12 in. (305 mm) brick separation from clay liner to combustibles. Fire clay liner (ASTM C315 or equivalent), minimum 3/8-in. (15=6 mm) wall thickness shall run from outer surface of brick wall to, but not beyond, the inner surface of chimney flue liner and shall be firmly cemented in place.	12/305
			
Minimum chimney clearance from masonry to sheet steel supports and combustibles 2 in. (51 mm) 	B	Solid insulated listed factory-built chimney length of the same inside diameter as the chimney connector and having 1 in. (25 mm) or more of insulation with a minimum 9-in. (229 mm) air space between the outer wall of the chimney length and combustibles. The inner end of the chimney length shall be flush with the inside of the masonry chimney flue and shall be sealed to the flue and to the brick masonry penetration with nonwater-soluble refractory cement. Supports shall be securely fastened to wall surfaces on all sides. Fasteners between supports and the chimney length shall not penetrate the chimney liner.	9/229



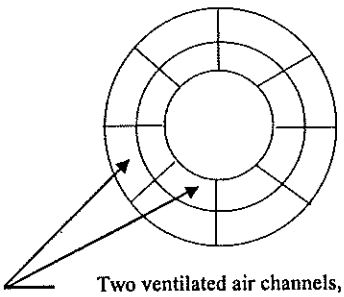
Minimum chimney clearance to sheet steel supports and combustibles 2 in. (51 mm)

C

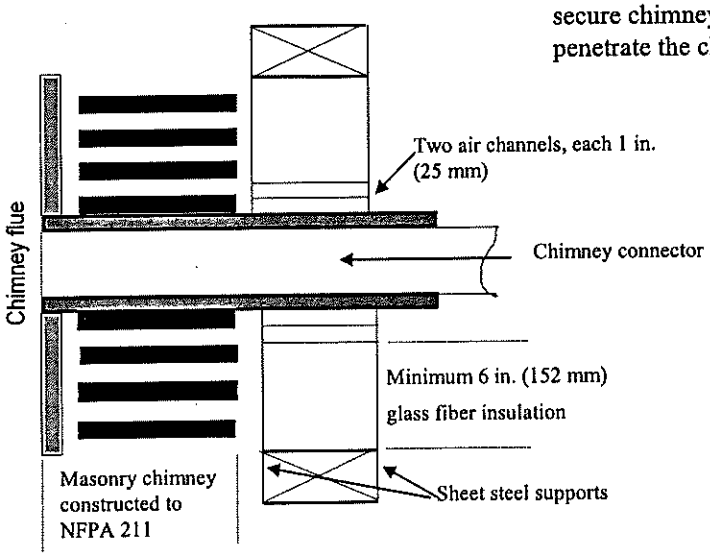
6/152

Sheet steel chimney connector, minimum 24 gage [0.024-in. (0.61 mm)] in thickness, with a ventilated thimble, minimum 124 gage [0.024 in. (0.61 mm)] in thickness, having two 1-in. (25 mm) air channels, separated from combustibles by a minimum of 6 in. (152 mm) of glass fiber insulation. Opening shall be covered and thimble supported with a sheet steel support, minimum 24 gage [0.024 in. (0.61 mm)] in thickness.

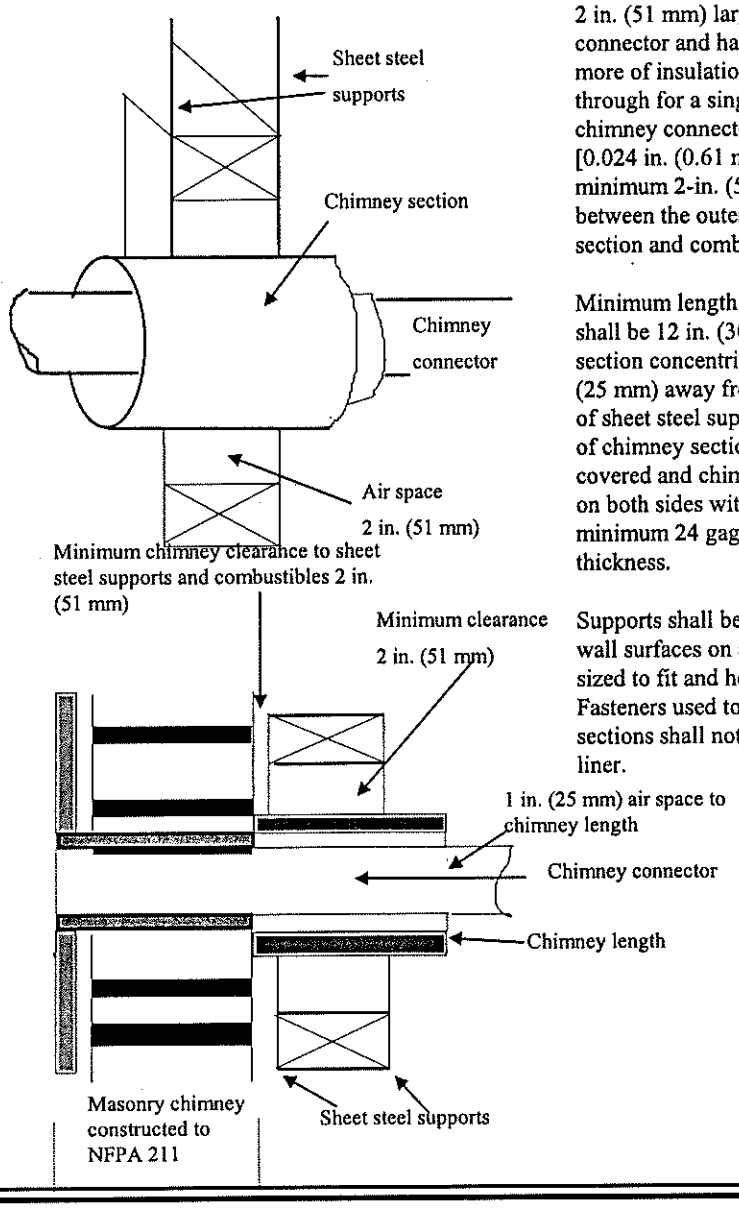
Supports shall be securely fastened to wall surfaces on all sides and shall be sized to fit and hold chimney section. Fasteners used to secure chimney sections shall not penetrate the chimney flue liner.



Two ventilated air channels, each 1 in. (25 mm). Construction of sheet steel.



D



Solid insulated listed factory-built chimney length with an inside diameter 2 in. (51 mm) larger than the chimney connector and having 1 in. (25 mm) or more of insulation, serving as a pass-through for a single wall sheet steel chimney connector of minimum 24 gage [0.024 in. (0.61 mm)] thickness, with a minimum 2-in. (51 mm) air space between the outer wall of chimney section and combustibles.

Minimum length of chimney section shall be 12 in. (305 mm). Chimney section concentric with and spaced 1 in. (25 mm) away from connector by means of sheet steel support plates on both ends of chimney section. Opening shall be covered and chimney section supported on both sides with sheet steel supports of minimum 24 gage [0.024 in. (0.61 mm)] thickness.

Supports shall be securely fastened to wall surfaces on all sides and shall be sized to fit and hold chimney section. Fasteners used to secure chimney sections shall not penetrate chimney flue liner.

Additional Requirements:

1. Insulation material used as apart of wall pass-through system shall be of noncombustible material and shall have a thermal conductivity of 1.0 Btu•in. Ft^2•°F (4.88 kg•cal/hr•m^2•°C) or less.

2. All clearances and thicknesses are minimums; larger clearances and thicknesses are acceptable.

3. Any material used to close up an opening for the connector shall be of noncombustible material.

4. A connector to a masonry chimney, except for System B, shall extend on to pierce through the wall pass-through system and the chimney wall to the inner face of the flue liner but not beyond.

8-6.3.4 Medium-heat industrial-type solid fuel burning appliances that are set on legs or pedestals that provide 18 to 24 in. (457 to 610 mm) of ventilated open space beneath the fire chamber or base of the appliance are permitted to be placed on floors of combustible construction provided the floor under the appliance is protected with two courses of hollow masonry units, each not less than 4 in. (102 mm) in thickness. The masonry units shall be laid with ends unsealed and joints matched in such a way as to provide a free circulation of air through the core spaces of the masonry. The top surface of the masonry shall be covered with a steel plate not less than 3/16 in. (4.8 mm) in thickness. The floor protection shall extend not less than 3 ft. (0;.92 m) beyond the appliance on all sides and 8 ft. (2.45 m) beyond the front or side where ashes are removed.

8-6.3.5 Medium-heat industrial-type solid fuel burning appliances with legs or pedestals that provide less than 18 in. (457 mm) of ventilated open space beneath the fire chamber or base of the appliance shall not be placed on floors of combustible construction.

8-6.4 Mounting of High-Heat Industrial-type Appliances.

8-6.4.1 High-heat industrial-type solid fuel burning appliances shall be placed in one of the following manners:

(1) On concrete bases adequately supported on compacted soil, crushed rock, or gravel;

(2) On floors constructed of noncombustible materials and having a fire resistance rating of not less than 2 hours. This construction shall extend not less than 10 ft. (3.1 m) beyond the appliance on all sides and not less than 30 ft. (9.2 m) beyond the front or side where hot products are removed;

(3) On properly stabilized ground that can support the load of the appliance.

8-6.4.2 Concrete bases and floors shall be designed and constructed to support the appliances.

8-6.4.3 High-heat industrial-type solid fuel burning appliances shall not be placed on floors of combustible construction.

8-7 Clearances

8-7.1 Solid fuel burning appliances shall be installed so that their use will not crate a hazard to person or property. The clearance shall be not less than specified in Table 8-7(a).

Exception No. 1: Appliances listed for installation with clearances less than specified in Table 8-7(a) may be installed in accordance with the terms of their listing and the manufacturer's instructions.

Exception No. 2: Heating furnaces and boilers and water heaters specifically listed for installation in spaces such as alcoves may be so installed in accordance with the terms of their listing provided the specified clearance is maintained regardless of whether the enclosure is of combustible or noncombustible material.

Table 8-7(a)
Standard Clearances for Solid Fuel Burning Appliances

For Reduced Clearances, see Table 8-7(b).
These clearances apply to appliances installed in rooms which are large in comparison with the size of the appliances.

Kind of Appliance	Above Top of Casing or Appliance. Above Top and Sides of Furnace Plenum or Bonnet in./mm	From Front in./mm	From Back[3] in./mm	From Sides[3] in./mm
Residential Appliances Steam Boilers - 15 psi Water Boilers - 250°F max. Water Boilers - 200°F max. All Water Walled or Jacketed	6/152	48/1219	6/152	6/152
Furnaces Gravity and Forced Air	18/457	48/1219	18/457	18/457
Room Heaters, Fireplace Stoves, Combinations	36/914	6/914	36/914	36/914
			Firing Side	Opp. Side
Ranges				
Lined Firechamber	30/762	36/914	24/610	18/457
Unlined Firechamber	30/762	36/914	36/914	18/457

To combustible material or metal cabinets. If the underside of such combustible material or metal cabinet is protected with sheet metal of not less than (0.024 in.) (0.610 mm) 24 gage spaced out in 1 in. (25.4 mm), the distance may be reduced to not less than 24 in. (610 mm).

8-7.2 Clearances from Solid Fuel Burning Appliances.

8-7.2.1 Clearances from listed and unlisted solid fuel burning appliances to combustible material may be reduced if the combustible material is protected as described in Table 8-7(b) and in Figures 8-7(a) to 8-7(d).

8-7.2.2 Clearances from solid fuel burning appliances to combustible material may be reduced if the combustible material is protected by an engineered protection system acceptable to the authority having jurisdiction. Engineered systems installed for the protection of combustible material shall reduce the temperature of such material to 90°F (50°C) rise above ambient. System design shall be based upon applicable heat transfer principles taking into account the geometry of the system, the heat loss characteristics of the structure behind the combustible material, and possible abnormal operating conditions of the heat-producing sources.

8-7.2.3 Clearances from solid fuel burning appliances to combustible material may be reduced by the use of materials or products listed for protection purposes. Materials and products listed for the purpose of reducing clearance to combustibles shall be installed in accordance with the conditions of the listing and the manufacturer's instructions.

8-7.2.4 For clearance reduction systems using an air space between the combustible wall and the wall protector, adequate air circulation shall be provided by one of the following methods as shown in Figure 8-7(e).

Table 8-7(b) Reduction of Appliance Clearance with Specified Forms of Protection [1,2,3,4,5,6,7,8,9,10]

Clearance reduction system applied to and covering all combustible surfaces within the distance specified as required clearance with no protection (see section 8-7.1).	Maximum allowable reduction in clearance (percent).		When the required clearance with no protection is 36 in., the clearances below are the minimum allowable clearances. For other required clearances with no protection, calculate minimum allowable clearance from maximum allowable reduction.[9,10]	
	As Wall Protector	As Ceiling Protector	As Wall Protector (in./mm)	As Ceiling Protector (in./mm)
(a) 3 1/2 in. (90 mm) thick masonry wall without ventilated air space.	33%	---	24/610	---
(b) 1/2 in. (13 mm) thick noncombustible insulation board over 1 in. (25 mm) glass fiber or mineral wool batts without ventilated air space.	50%	33%	18/457	24/610
(c) 0.024 in./0.61 mm (24 gage) sheet metal over 1 in. (25 mm) glass fiber or mineral wool batts reinforced with wire, or equivalent, on rear face with ventilated air space.	66%	50%	12/305	18/457
(d) 3 1/2 in. (90 mm) thick masonry wall with ventilated air space.	66%	---	12/305	---
(e) 0.024 in./0.61 mm (24 gage) sheet metal with ventilated air space.	66%	50%	12/305	18/457
(f) 1/2 in. (13 mm) thick noncombustible insulation board with ventilated air space.	66%	50%	12/305	18/457
(g) 0.024 in./0.61 mm (24 gage) sheet metal with ventilated air space over 0.024 in./0.61 mm (24 gage) sheet metal with ventilated air space.	66%	50%	12/305	18/457
(h) 1 in. (25 mm) glass fiber or mineral wool batts sandwiched between two sheets 0.024 in./0.61 mm (24 gage) sheet metal with ventilated air space.	66%	50%	12/305	18/457

[1] Spacers and ties shall be of noncombustible material. No spacers or ties shall be used directly behind appliance or conductor.

[2] With all clearance reduction systems using a ventilated air space, adequate air circulation shall be provided as described in 8-7.2.4. There shall be at least 1 in (25 mm) between the clearance reduction system and combustible walls and ceilings for clearance reduction systems using a ventilated air space

[3] Mineral wool batts (blanket or board) shall have a minimum density of 8 lb per ft^3 (128.7 kg./m^3) and have a minimum melting point of 1500° F (816 ° C).

[4] Insulation material used as part of clearance reduction system shall have a thermal conductivity of 1.0 (Btu-in.)/(sq. ft.-hr.°F) or less. Insulation board shall be formed of noncombustible material.

[5] If a single wall connector passes through a masonry wall used as a wall shield, there shall be at least 1/2 in. (13 mm) of open, ventilated air space between the connector and the masonry.

[6] There shall be at least 1 in. (25 mm) between the connector and the protector. In no case shall the clearance between the appliance and the wall surface be reduced below that allowed in the table.

[7] Clearances in front of the loading door and/or ash removal door of the appliance shall not be reduced from those in Section 8-6.

[8] All clearances and thicknesses are minimum; larger clearances and thicknesses are acceptable. Clearances are not to be less than 12 in. (305 mm) from appliances.

[9] To calculate the minimum allowable clearance, the following formula may be used:

$C_{pr} = C_{un} \times (1\text{-}R/100)$. C_{pr} is the minimum allowable clearance, C_{un} is the required clearance with no protection, and R is the maximum allowable reduction in clearance.

[10] Refer to Figures 8-7(f) and 8-7(g) for other reduced clearances using materials (a) through (h).

COMM 64.52 MAINTENANCE AND OPERATION.

(1) MAINTENANCE. All heating, ventilating, exhaust and air conditioning systems shall be maintained in good working order and shall be kept clean and sanitary. Clearances and accessibility shall be provided for equipment maintenance. Chimneys or vents and connectors serving solid-fuel burning appliances shall be cleaned and inspected for damage annually. Chimneys and vents, which have been subjected to a chimney fire, shall not be reused until inspected and approved by the department or authorized deputy.

(2) OPERATION. All heating, ventilating and exhaust systems shall be operated to satisfy the requirements of this chapter during periods the building is occupied.

(3) INSTRUCTIONS. The designer or installer shall provide the owner with written instructions for the operation and maintenance of the system and equipment.

COMM 64.53 FINAL TEST REQUIRED.

(1) The designer, installer or recognized balancing agency shall be responsible for the testing and balancing of every heating, ventilating and air conditioning system. The person or agency responsible for balancing of the ventilating system shall document in writing the amount of

outdoor air being provided and distributed for the building occupants and any other specialty ventilation. The document shall be retained at the site and shall be made available to the department upon request.

(2) (a) Air systems shall be balanced in a manner to minimize losses from damper throttling by first adjusting fan speed then adjusting dampers to meet design flow conditions. Balancing procedures shall be acceptable to the department. Damper throttling alone may be used for air system balancing with fan motors of 1 hp or less, or if throttling results in no greater than 1/3 hp fan horsepower draw above that required if the fan speed were adjusted.

(b) 1. Except as provided in subd. 2., hydronic systems shall be balanced in a manner to minimize valve throttling losses by first trimming the pump impeller or adjusting the pump speed then adjusting the valves to meet design flow conditions.

2. As an exception to subd. 1., valve throttling alone may be used for hydronic system balancing under any of the following conditions:

a. Pumps with pump motors of 10 hp or less;

b. If throttling results in no greater than 3 hp pump horsepower draw for pumps of 60 hp or less, or no greater than 5 percent of pump horse power draw for pumps greater than 60 hp, above that required if the impeller were trimmed;

c. To reserve additional pump pressure capability in open circuit piping systems subject to fouling. Valve throttling pressure drop shall not exceed that expected for future fouling; or

d. Where it can be shown that throttling will not increase overall building energy costs.

(3) An operating and maintenance manual shall be provided to the building owner or operator. The manual shall include basic data relating to the operation and maintenance of HVAC systems and equipment. Required routine maintenance actions shall be clearly identified. Where applicable, HVAC controls information such as diagrams, schematics, control sequence descriptions, and maintenance and calibration information shall be included.

Note: National Environmental Balancing Bureau (NEBB) Procedural Standards, the Associated Air Balance Council (AABC) National Standards or equivalent balancing procedures are acceptable to the department.

(4) HVAC control systems shall be tested to assure that control elements are calibrated, adjusted, and in proper working condition.

Note: Submittal of the compliance statement is accepted as verification of compliance with this section.

*The reference to this section on the compliance form is **not** requesting that a report be submitted for review. It is asking that the supervising professional or designer has checked that the document has been completed & provided to the building owner or operator as required.*

Subchapter VIII -- Occupancy Requirements

COMM 64.54 FACTORIES, OFFICE AND MERCANTILE BUILDINGS.

(1) **SCOPE.** This section applies to all places of employment, mercantile buildings, retail establishments where goods and commodities are bought and sold, and places where not more than 100 persons assemble for worship, recreation, entertainment or dining purposes.

Note: For mall corridors of enclosed mall shopping centers, see s. COMM 64.05, Table 1.

(2) VENTILATION. The air change, supply and distribution for all occupancies in this class shall conform to the requirements of s. COMM 64.05, except that natural ventilation or mechanical ventilation need not be provided in warehouses and cold storage buildings.

(3) INDUSTRIAL EXHAUST SYSTEM.

(a) *Contaminants.* Industrial exhaust systems shall be installed and operated to remove harmful contaminants in conformance with ch. COMM 32, Safety and Health Standards for Public Employees.

(b) *Make-up air.* Make-up air shall be provided as required by s. COMM 64.14. The quantity of make-up air shall equal at least 90% of the air exhausted.

Note: The quantity of makeup air shall equal at least 90% of the air exhausted.

(c) *Connections.* Connections between industrial exhaust systems that convey different materials, the combination of which may produce explosive, heat-generating, corrosive, toxic, or otherwise dangerous mixtures, shall be prohibited.

(4) LOCKER ROOMS AND CHANGE ROOMS. Locker rooms and change rooms provided in accordance with s. COMM 54.13 (1) for employees exposed to toxic materials or industrial poisons shall be provided with a direct supply of outside air or air that is transferred from uncontaminated areas. All other locker rooms shall be provided with outside air as specified in Table 64.05.

Note: Exhaust air from locker rooms other than those provided in accordance with s. COMM 54.13 may be directed through the adjoining toilet room or shower room.

COMM 64.55 THEATERS AND PLACES OF ASSEMBLY.

(1) SCOPE. This section applies to all auditoriums, arenas, armories, assembly halls, banquet halls, billiard rooms, bowling alleys, cafeterias, club rooms, dance halls, dining rooms, gymnasiums, lecture halls, lodge halls, playrooms, restaurants, school auditoriums, Sunday schools and places of worship, funeral home chapels, parochial schools, convents, indoor skating rinks, and theaters which accommodate more than 100 persons for entertainment, recreation, worship, or dining purposes.

Note: For areas that will accommodate less than 100 persons, see s. COMM 64.54.

(2) VENTILATION. The air change, supply and distribution for all occupancies under this classification shall conform to the requirements of s. COMM 64.05.

(3) ALTERNATE SERVICE AND CAPACITY. Heating and ventilating systems installed in places of worship, Sunday schools, and lodge halls may be arranged for selective delivery of the entire service to either the first floor area or to the basement floor area provided these areas are not used simultaneously.

(4) STAGES. The stage in any theater or assembly hall, for which a fire curtain is required, shall be supplied with sufficient air or other means to equalize the pressure to avoid deflecting the curtain.

Note: See ss. COMM 55.21 through 55.23 concerning proscenium walls and curtains.

COMM 64.56 SCHOOLS AND OTHER PLACES OF INSTRUCTION.

(1) SCOPE. This section applies to all public and private schools, colleges, universities, academies, seminaries, libraries, museums, art galleries, all places used for vocational instruction and research such as laboratories, shops, science rooms, and all parts of buildings used for instructional purposes.

(2) VENTILATION.

(a) The air change, supply and distribution shall conform to the requirements of s. COMM 64.05.

(b) For corridors provided with lockers, the air supply shall be accomplished by means of air inlets admitting air from adjacent classrooms or by a direct tempered air supply. Air from corridors with lockers may be recirculated.

The corridor ventilation requirement allows air to be transferred from non-laboratory classrooms to the corridor. Since this air is not considered contaminated, it may be exhausted, transferred to a space of higher contamination, or returned to the air handling system. Contaminated air from chemical laboratories and similar uses may not be transferred to the corridors.

(3) EXHAUST SYSTEMS AND HEAT RECOVERY.

(a) An exhaust system, as specified in s. COMM 64.54 (3), shall be provided for all equipment and processes that create dust, fumes, vapors and gases injurious to health.

(b) Exhaust systems whose operation is more than 3600 hours per year shall be equipped with heat recovery devices to reduce the energy consumption in the building.

1. Exception.

a. Systems exhausting explosive materials, such as perchloric acid need not be so equipped.

b. Fan systems exhausting 250 CFM or less need not be so equipped.

COMM 64.57 HEALTH CARE FACILITIES.

(1) SCOPE. The rules of this section apply to hospitals, nursing homes and outpatient surgical facilities where medical services are provided.

This section requires heating, ventilating and air conditioning systems of hospitals, nursing homes and outpatient surgical facilities, including surgical facilities contained within clinics and physicians offices which provide medical services to comply with the Department of Health and Family Services Publications HSS 124 (Hospitals) and HSS 132 (Nursing Homes); as well as the 1996-97, Guidelines for Design and Construction of Hospital and Health Care Facilities. The purpose of this code section is to eliminate conflicting requirements between Safety & Buildings and the Department of Health and Family Services.

(2) GENERAL.

(a) The heating ventilating and air conditioning systems of all occupancies within the scope of this sections shall be designed, operated and maintained as specified in AIA, "Guidelines for Construction and Equipment of Hospital and Medical Facilities."

Note #1: Newer versions of the Guidelines may be used in their entirety when approved by the Department.

Note #2: The 1992-93 edition of the Guidelines has been deemed as acceptable and although other portions of the Guidelines may be used for determining the needs of the HVAC system, the majority of the requirements pertaining to the HVAC system will be found in sections 2, 7.31.A. to D., 8.11.A. to D., 9.2.L., 9.4.I., 9.5.L., and 9.6.J of that standard.

Note #3: The newest version of the Guidelines which has been deemed acceptable and is the 1996-97 edition titled "Guidelines for Design and Construction of Hospital and Health Care Facilities" Although other portions of the Guidelines may be used for determining the needs of the HVAC system, the majority of the requirements pertaining to the HVAC system will be found in sections 2, 7.31.A. to D., 8.31.A. to D., 9.31.L., 9.4.I., 9.5.L., and 9.6.J of the newest standard.

(b) The heating, ventilating and air conditioning system shall also be designed, operated and maintained as specified in the applicable sections of the following standards as referenced in AIA, "Guidelines for Construction and Equipment of Hospital and Medical Facilities."

1. NFPA No. 90A;
2. ASHRAE Handbook of Fundamentals; and
3. ASHRAE Standard No. 52.

(3) APPLICATION OF RULES. Where other provisions of ch. COMM 64 specify different requirements than those contained in this section, the requirements in sub.(2) shall govern.

COMM 64.58 PENAL INSTITUTIONS AND PLACES OF DETENTION.

(1) SCOPE. This section applies to all corridors and areas of compulsory occupancy in penal institutions, mental hospitals and other places of detention.

(2) VENTILATION. The air change, supply and distribution for all areas of this class shall conform to the requirements of s. COMM 64.05.

The minimum ventilation requirement for jail cells provided with a water closet shall be based on either 75 cfm or 2 cfm per square foot of floor area whichever is least.

(3) OVERNIGHT LOCK-UPS. Where cells are provided for not more than 6 occupants for the purpose of overnight detention only, exhaust ventilation shall be provided on the basis of 6 air changes per hour for the occupied area.

COMM 64.59 RESIDENTIAL OCCUPANCIES.

(1) SCOPE. This section applies to all apartments, row houses, rooming houses, hotels, motels, dormitories, and all other places of abode.

Note: See s. COMM 51.01 (102a) for definition of "place of abode."

(2) VENTILATION. The air change, supply and distribution for all areas of this class shall conform to the requirements of s. COMM 64.05.

The common areas in residential occupancies shall be ventilated the same as Chapter 54 occupancies.

(3) RETURN AIR DUCTS. Unlined wood joists and stud spaces will be permitted to be used as return air ducts in individual living units provided with individual heating and ventilating systems.

COMM 64.60 DAY CARE FACILITIES.

(1) SCOPE. This section applies to all public and private day care centers accommodating more than 4 children, including all buildings or parts of buildings used as child day care facilities.

(2) VENTILATION. The air change, supply and distribution for all areas of this class shall conform to the requirements of s. COMM 64.05.

COMM 64.61 REPAIR AREAS.

(1) SCOPE. This section applies to all areas where motor-driven vehicles are repaired involving the fuel system components or requiring the operation of the internal combustion engine.

(2) VENTILATION. The air change, supply and distribution shall be provided in accordance with the requirements of s. COMM 64.05. The exhaust air shall be drawn from not more than 18 inches above the floor.

(3) TAIL PIPE EXHAUST.

(a) *Mechanical exhaust system.* A mechanical exhaust system shall be provided in the repair area to remove the exhaust fumes from internal combustion engines. The duct system shall be designed with sufficient outlets to accommodate the total number of vehicles in the repair area. A flexible hose, equipped with a device for connecting it to the exhaust pipe of the vehicle and to the exhaust system, shall be provided. Each outlet shall be provided with a shut-off valve that can be closed when not in use. The blower capacity shall be sufficient to exhaust a volume of air not less than 100 cubic feet per minute for each opening.

(b) *Nonmechanical exhaust.* A noncombustible flexible tube or hose not more than 10 feet long, connected to the engine exhaust (tail pipe) and terminating outside the building, may be used in lieu of the requirements stated in par. (a).

Note: The requirements stated in sub. (2) need not be increased when satisfying the requirements of either sub. (3) (a) or (b). Also see ch. 32, Safety and Health Standards for Public Employees.

(4) MISCELLANEOUS REPAIR AREAS. Areas involved in the servicing of small internal combustion engines such as lawn mowers, snowmobiles, chainsaws, cycles, boat engines, and similar types of engines, and battery charging areas, shall be ventilated as required for repair areas under s. COMM 64.05.

Question: *Should an enclosure be required for battery charging areas?*

Answer: *COMM 64.61 (4) requires 3/4 cfm of outside air and equivalent exhaust per square foot of* ***enclosed*** *service floor area.*

The hazard relating to battery charging areas is the release of hydrogen. The NEC Handbook cites NFPA 70 480-8(a) as follows:

Hydrogen disperses rapidly and requires very little air change to prevent accumulation. Unrestricted natural air movement in the vicinity of the battery, together with normal air changes for occupied spaces or heat removal, will normally be sufficient. If the space is confined, mechanical ventilation may be required in the vicinity of the battery.

The department has historically allowed the omission of mechanical exhaust where calculations verify the hydrogen content is less than 1.5 percent by volume of the air in the large space.

Therefore, enclosure of a battery charging area is not required. If an enclosure is provided, the enclosure must be ventilated at the rate of 3/4 cfm per square foot of enclosed floor area.

(5) CONTAMINANTS. If the provisions of this section do not provide sufficient ventilation to meet the standards for threshold limit values covered in ch. COMM 32, Safety and Health Standards for Public Employees, the additional exhaust requirements with an equivalent volume of outside air shall be provided to satisfy the requirements found in ch. COMM 32.

Note that the exhaust and air supply requirements for garages (both repair & storage) and vehicle service buildings are the MINIMUMS required to meet the code and that the exhaust air to meet this minimum shall be drawn from not more than 18" from the floor. If additional exhausts are required (due to other contaminants), those exhausts and the required make-up air shall be added to these minimum requirements.

COMM 64.62 VEHICLE SERVICE BUILDINGS.

(1) APPLICATION.

(a) This section applies to liquid fuel dispensing stations and facilities where vehicles can be driven into the building for washing, greasing, oil change, tire replacement, body repair, and similar operations.

The similar operations refer to any area where vehicles are driven into a work station situation. This would include vehicle repair or service estimate areas, drive in insurance claims, auto upholstery, glass replacement, sun roofs, cellular phone installations and radio installation.

(b) The exhaust air shall be drawn from not more than 18 inches above the floor.

(2) VENTILATION.

(a) Air change, supply, distribution and exhaust shall be provided as specified in s. COMM 64.05.

(b) Buildings or portions of buildings having a capacity of and used exclusively for washing 2 or more vehicles simultaneously shall be exhausted at not less than 1/2 cubic foot per minute per square foot of floor area based on that portion of the floor located between the termination of the conveyor system and the vehicle exit door. A supply of makeup air is not required for this exhaust.

(c) If the provisions of this section do not provide sufficient ventilation to meet the standards for threshold limit values covered in ch. COMM 32, Safety and Health Standards for Public Employees, the additional exhaust requirements with an equivalent volume of outside air shall be provided to satisfy the requirements found in ch. COMM 32.

COMM 64.63 GARAGES.

(1) SCOPE. This section applies to all buildings, or parts of buildings, into which motor vehicles are driven for loading or unloading or are stored.

This section also applies to areas where vehicles are driven into for loading or unloading such as drive through loading areas.

(2) VENTILATION.

(a) Except as permitted in pars. (b), (c) and (d), the air change, supply and distribution for garages shall be provided in accordance with s. COMM 64.05. Exhaust air shall be drawn not more than 18 inches above the floor.

(b) The air change, supply and distribution for a storage garage accommodating 6 or more vehicles may be provided by permanent open-wall areas, if:

1. The open-wall areas equal at least 30% of the total wall area enclosing the garage;
2. The open-wall areas are distributed to permit air circulation throughout the garage; and
3. The entire floor of the garage is located at or above grade.

(c) The air movement, supply and distribution for a storage garage accommodating 6 or more vehicles may be provided by 3% openings that comply with s. COMM 64.05(4) if:

1. The building is unoccupied.
2. The storage garage building does not contain and is not attached to any other occupancy or use.

3. The entire floor of the garage is located at or above grade.

(d) An intermittent mechanical exhaust ventilation system may be used in lieu of continuous exhaust if the conditions given in subds. 1. and 2. are met.

COMM 64.63(2)(d) has a typographical error. The sentence should read "An intermittent mechanical exhaust ventilation system may be used in lieu of continuous exhaust if the conditions given in subds.1., 2., **and 3.** *are met. Without recognition of the error, COMM 64.63(2)(d)3. has no application.*

1. The system shall be activated to provide exhaust ventilation rates specified in s. COMM 64.05 by a continuous monitoring and detection system which can maintain carbon monoxide levels below 35 ppm and nitrogen dioxide levels below one ppm.

It is extremely important to maintain the correct calibration and performance features of the monitor/detection system. These must be tested frequently.

2. The system shall be provided with automatic controls to provide exhaust ventilation at a rate of 1/2 cfm per square foot for a total of at least five hours in each 24-hour period.

3. A means shall be provided to maintain negative pressure relative to adjacent areas.

(3) CONTAMINANTS. If the provisions of this section do not provide sufficient ventilation to meet the standards for threshold limit values covered in ch. COMM 32, Safety and Health Standard for Public Employees, the additional exhaust requirements with an equivalent volume of outside air shall be provided to satisfy the requirements found in ch. COMM 32.

COMM 64.64 VEHICLE SHOWROOMS.

(1) SCOPE. This section applies to all vehicle showrooms with offices and occupancies unless designed as part of the vehicle garage adjacent to repair or vehicle storage areas where all vehicles displayed in the showroom are without batteries and fuel tanks are empty and free of fumes.

Note: A live storage area is any area used for storage of fire trucks, tractors, automobiles, trucks, and similar self-propelled vehicles which are driven in and out of the storage area under their own power; it does not include areas where vehicles and equipment are stored for seasonal periods, or areas where vehicles are displayed without batteries and where the gasoline tanks of the vehicles are empty and free of fumes.

(2) VENTILATION. The air change, supply and distribution shall be provided in accordance with the requirements of s. COMM 64.05.

(a) *Separate ventilating system.* A separate ventilating system shall be provided for showrooms or offices where such occupancies are adjacent to repair or live storage areas.

Note: Ventilation is not required if an openable area is provided to conform with the requirements of s. COMM 64.07.

Also see COMM Table 64.05 for percent openable requirements.

(b) *Recirculation.* Air shall not be recirculated from any repair, live storage or service area unless the total volume of air in circulation is in excess of the ventilation required. Excess air may be recirculated.

(c) *Contaminants.* If the provisions of this section do not provide sufficient ventilation to meet the standards for threshold limit values covered in ch. COMM 32, Safety and Health

Standards for Public Employees, the additional exhaust requirements with an equivalent volume of outside air shall be provided to satisfy the requirements found in ch. COMM 32.

COMM 64.65 GENERAL SANITATION AND SERVICE AREAS.

(1) SCOPE. This section applies to toilet rooms, diaper changing rooms, locker rooms, shower rooms, and janitor closets. Separate diaper changing rooms shall be ventilated in the same manner as required for toilet rooms at 2 cfm per square foot.

(2) EXHAUST VENTILATING SYSTEMS. Exhaust ventilating systems serving this class of occupancy may be combined with other exhaust services provided the combined system:

(a) Does not allow recirculation; and

(b) Does not include grease hood exhaust, radioactive exhaust, fume hood exhaust, exhaust required by ch. COMM 32, exhaust that requires electrical grounding, or exhaust that requires spark resistant fan construction.

(3) VENTILATING SYSTEM APPLICATION. Ventilation shall be provided for all areas of this class in accordance with this subsection. Areas of this class that are not ventilated in accordance with applicable pars. (a) through (e) shall be provided with mechanical exhaust ventilation as specified in s. COMM 64.05. The effectiveness of the exhaust shall be greater than the supply.

(a) Toilet rooms that have only one water closet or urinal shall be provided with either natural ventilation via a window with at least 2 square feet of area openable directly to the outside, or mechanical exhaust ventilation as specified in s. COMM 64.05. Toilet rooms that have only one water closet or urinal that are not located in restaurants or taverns may use an approved ductless air circulating and treatment device in place of natural or exhaust ventilation.

(b) Janitor closets that have only one service sink or receptor shall be provided with either natural ventilation via a window with at least 2 square feet of area openable directly to the outside, or an approved ductless air circulating and treatment device, or mechanical exhaust ventilation as specified in s. COMM 64.05.

(c) Bathrooms with one bathtub or shower, or one combined tub and shower, and one water closet or urinal shall be provided with mechanical exhaust ventilation capable of exhausting 50 cubic feet per minute.

Comm 64.65(3)(c) permits a minimum exhaust rate of 50 cfm for the following: (1) one bathtub and one urinal or toilet; (2) one shower and one urinal or toilet; (3) one combination bathtub/shower and one urinal or toilet. A lavatory may be included in all of the above. All other combinations require a minimum of 2 cfm/sq.ft or 75 cfm per toilet fixture. Schools require the maximum exhaust of the two methods listed.

(d) Adjoining locker, shower and toilet rooms shall be exhausted at the rate specified in s. COMM 64.05, based on the largest amount of exhaust required for any of the three rooms. The rooms shall be provided with tempered make-up air supplied directly from the outside or transferred from other areas of the building in accordance with s. COMM 64.18. A negative pressure relationship shall be maintained in the shower and toilet rooms with respect to the locker room.

(e) Rooms for the changing of clothing only with provisions for short-term storage of clothes, other than areas for industrial employees as specified in s. COMM 64.54 or areas for employees exposed to toxic materials as specified in s. COMM 54.13, shall be ventilated as

changing rooms as specified in s. COMM 64.05, Table 64.05. This paragraph does not apply to shower or toilet rooms.

(f) Chemical or septic toilets shall not be placed in rooms provided with mechanical ventilation. Toilet rooms with chemical or septic toilets shall be provided with natural ventilation via a window with at least 2 square feet of area openable directly to the outside. The window shall be provided with a screen to limit the passage of insects and vermin.

(4) MAINTENANCE OF NEGATIVE PRESSURE. Toilet rooms and janitor closets shall be provided with negative pressure relative to adjacent areas. If supply air is provided to toilet rooms or janitor closets, the exhaust must also be provided simultaneously.

In accordance with Comm 64.08(3) & 64.65(4), toilet room exhausts must operate continuously when the building is occupied. Toilet room exhausts may NOT be interconnected with the toilet room lights, unless the lights are on a building, and not a room, lighting system which has occupied/unoccupied modes (i.e. an exhaust fan may NOT be wired to a toilet room's occupancy sensor). The department will allow the operation of toilet room exhausts on a toggle switch or toilet room light switch in residential occupancies.

COMM 64.66 NATATORIUMS.

(1) POOL VENTILATION. In natatoriums, a volume of tempered outside air supply and exhaust shall be provided at the rate specified in s. COMM 64.05. The tempered outside air may be supplied directly from the outside or transferred from other areas of the building in accordance with s. COMM 64.18. The volume of tempered air and exhaust may be reduced to a minimum of one cubic foot per minute per square foot of pool surface provided automatic humidity controls are used to limit the relative humidity to 60%.

The tempered air may be supplied directly from the outside or transferred from other areas of the building in accordance with COMM 64.18.

(2) AIR MOVEMENT. The air change rate in a natatorium shall be not less than 6 air changes per hour unless mechanical cooling is provided to satisfy the heat gain requirement for the space.

COMM 64.67 KITCHENS.

(1) SCOPE. This section applies to all areas where food is prepared, except in domestic science educational facilities from grades kindergarten through 12, and single unit apartments in hotels, motels and apartment buildings.

(2) EXHAUST VENTILATION SYSTEMS. Exhaust ventilation systems serving this occupancy shall not be used for any other service.

(a) *Required exhaust ventilation.* When cooking equipment is being operated, mechanical exhaust ventilation shall be provided at a rate specified in s. COMM 64.05 for every occupied area within the scope of this section. When cooking equipment is not being operated, a minimum supply of outside air and exhaust at 7.5 cfm per person or natural ventilation with openings equal in area to 3% of the floor area as specified in s. COMM 64.07 shall be provided during periods of occupancy.

(b) *Kitchen exhaust hoods.* Cooking equipment which produces grease laden vapors, including but not limited to fryers, grills, griddles and broilers, shall be provided with a kitchen exhaust hood, except an exhaust hood does not have to be provided for a single piece of equipment if:

1. The piece of equipment has a frying/cooking surface area of 4 square feet or less; and
2. The piece of equipment is the only piece of grease-producing equipment for the entire food preparation operation.

Required Exhaust Hood. *Exhaust hoods shall be required where frying, including deep-fat frying and surface frying, or broiling or both is conducted as part of a regular commercial or institutional operation involving ranges, griddles, fryers, broilers and similar grease-producing equipment. See following guidelines from the Hotel & Restaurant licensing agency for further details.*

Referrals from Health and Family Services, Hotel and Restaurant Section, on existing conditions concerning ventilation requirements for cooking equipment must be routed through the central state inspection office for documentation prior to investigation by field staff.

Question: *Which types of food service cooking equipment require commercial ventilation hoods with filters? Which do not?*

Analysis *The following policy is established based on comments and discussions from state and local environmental health professionals and representatives from the Division of Safety & Buildings and its building code interpretations.*

Answer: *The following list by way of illustration and not limitation should serve as a guide in evaluating forms, functions and usage in field situations of various food service cooking devices. All areas where food is prepared must meet the requirements of COMM Chapter 64 Heating, Ventilation and Air Conditioning. Questionable equipment should be field evaluated by the Dept. of Health & Family Services and the Division of Safety & Buildings..*

Commercial Hood With Filters Required

a. Gas broiler/grill combination top and bottom heat.

b. Convection oven - heats at 225°F to 500°F, used to roast meats.

c. Electric or gas range - oven for roasts and frying on burners.

d. Hot plate to cook hamburgers or other grease producing food products.

e. Grill/griddle used for frying (includes grilling of sandwiches, frying bacon, eggs, etc.)

f. Gas-fired South Bend or Stack units/infrared stone (operates at 1500°F. to 1600°F.

g. Charcoal/mesquite grills or other cooking devices which use a chimney or fireplace. (Also requires that all splash areas, interior and exterior surfaces be stainless steel or glazed brick with flush joints.)

h. Broasters and pressurized smokers.

I. Gyros vertical broilers.

j. Deep fryers.

k. Conventional ovens used in the preparation of grease-producing food items.

Note: S&BD official building code interpretation of May 12, 1987, allows grease-producing equipment (griddles, ranges, fryers, broilers, etc.) with a total surface area of less than 4 square feet to be used without a required exhaust hood.

No Commercial Hood Required

a. Electric Clark Broiler or Presto Single Hamburger Cooker.

b. Electric infrared oven to heat hermetically sealed sandwiches.

c. Electric oven to cook frozen or refrigerated pizzas.

d. Microwave oven to heat and cook.

e. Alto Sham Ovens - low temperature cooking at 200°F.

f. Electric or Gas range - cooking soups and baking potatoes only.

g. Commercial slo-cookers.

h. Hot plate to parboil chicken only.

I. Electric or gas pizza oven for fresh pizza.

j. Fancy Fry (Brand) deep fryer units.

In establishments with an existing code-complying hood, the addition of equipment will not require modification of the hood unless the additional equipment exceeds the 4 square feet total surface area. The need for ventilation over a piece of equipment which is questionable must be determined by the sanitarian. Documentation must be made on the inspection report on cooking limitations if a hood with filter is not needed. Specific construction and design criteria for required hoods must meet the standards of the National Sanitation Foundation. Sizing, capacity, air changes, duct work, etc., must be in compliance with the Wisconsin Department of Commerce rules COMM 64.67. S&BD bases much of its policy interpretation on the National Fire Protection Association (NFPA) 96 standards. The 1984 edition of NFPA 96 states that a hood "may be located over most or all of the cooking appliances or it may be a fixed device located in close proximity to a cooking appliance(s)." COMM 64.67 currently requires a hood to be located over equipment.

(3) REPLACEMENT AIR. Adequate replacement air shall be provided to equal the air being exhausted by all exhaust systems.

S&BD policy is that plan submission, review and approval is not required for make-up air if the total exhaust is less than 1/2 air change per hour. The provisions of COMM 64.14 would apply to the ventilation system. The following formula shows how to calculate 1/2 air change per hour.

(volume of occupancy/air change) x (0.5 air change/hr) x (1 hr/60 min) = ½ air change per hour (CFM).

(4) EXHAUST HOOD REQUIREMENTS.

(a) *Size of hood.* The horizontal inside dimensions for canopy hoods shall be sized to effectively capture grease vapors, but in no case shall these dimensions be less than the overall horizontal dimensions of the grease-producing equipment. The horizontal inside dimensions for noncanopy, prefabricated backshelf hoods may be less than the overall horizontal dimensions of the grease-producing equipment.

(b) *Exhaust rates.* The kitchen exhaust hood shall be provided with a capture velocity to effectively capture the grease vapors and may be designed through engineering analysis or the empirical design formulas stated below:

1. Canopy hood. Hood open on all 4 sides: Q = 125 cfm A (area).

2. Wall hood. Hood open on 3 sides or less: Q = 80 cfm A (area).

3. Slotted-type hood. V = 350 feet per minute through the slot opening. The slot shall be at least 3 inches in width and shall extend around the open sides of the hood; and

4. Noncanopy hood. The minimum volume of exhaust air for noncanopy type hoods (prefabricated backshelf) may be not less than Q = 200 cfm L (length).

Exhaust rates may be reduced below those given in the code if the particular hood under consideration is listed for exhausting at a reduced rate. The department recognizes Underwriters' Laboratory fire protection equipment directory listings.

Note: Q equals the exhaust air in cubic feet per minute; A equals the area of the hood over the grease-producing equipment in square feet; V equals the velocity in feet per minute; and L equals the total length in feet of the cooking appliance being ventilated, and measured parallel to the front edge of the appliance.

(c) *Materials.* Hoods shall be constructed and supported by steel not less than .0478 inch U.S. standard gage (No. 18 manufacturers standard gage) or stainless steel not less than .0359 inch U.S. standard gage (No. 20 manufacturers standard gage) or other materials of equivalent strength, fire and corrosion resistance.

Note: The Department of Health and Social Services (DHSS) may have additional requirements for materials in commercial food preparation areas. For more information, contact the DHSS Environmental Sanitation Unit.

(d) *Seams.* All seams and joints shall be liquid-tight.

(e) *Grease-removal devices.* Approved grease extractors, grease filters or other grease-removal devices shall be provided.

(f) *Exposed hood surfaces.* Hood surfaces and exposed exhaust ducts within 18 inches of combustible material shall be protected as specified in sub. (5) (f).

(g) *Concealed hood surfaces.* Hood surfaces that are concealed by or recessed into adjoining construction shall be protected as specified in sub. (5) (f).

(h) *Double-wall hoods utilizing outdoor air.* When hoods are connected to ducts supplying outside air, performance data shall be submitted.

Note: Double-wall hoods provided with a supply of outdoor air conserve energy.

(5) EXHAUST DUCTS FROM HOODS.

(a) *Design.* All ducts shall lead, as directly as possible, to the exterior of the building without forming dips or traps which collect residues. Ducts exposed to the exterior shall be protected with a suitable weatherproof coating.

Note: Temperatures in excess of 2000°F. may be experienced within ducts in the event of fire. A means of expansion of long ducts should be considered.

(b) *Materials.* Ducts shall be constructed of and supported by steel not lighter than .0598 inch U.S. standard gage (No. 16 manufacturers standard gage) or stainless steel not lighter than .0478 inch U.S. standard gage (No. 18 manufacturers standard gage) or other materials of equivalent strength, fire and corrosion resistance.

(c) *Seams and joints.* All seams and joints shall be liquid-tight.

(d) *Clean-out openings.* Accessible clean-out openings at the sides of ducts shall be provided at each change of direction of the duct for inspection and servicing.

(e) *Interior ducts.* Ducts shall not pass through required fire walls or partitions.

(f) *Concealed exhaust ducts.*

1. ' Horizontal ducts.' Horizontal concealed ducts connected to hoods that pass through any other area of the building, including suspended ceilings, shall be protected with insulating material to withstand a flue temperature of not less than 1000°F. The temperature of the exposed surface of the insulating material shall not exceed 250°F. above the normal ambient temperature of 68°F.

The code requires concealed exhaust ducts to be insulated. One layer of 5/8 inch type X gypsum board is acceptable to protect a kitchen exhaust duct to withstand a flue temperature of not less than 1,000 degrees F with the temperature of the exposed surface not exceeding 250°F above the normal ambient temperature of 68°F as outlined in COMM 64.67(5)(f). Proprietary materials such as 2 1/2-inch U.S. Gypsum Thermafiber may be used.

Note: The department will accept the use of masonry chimneys or manufactured chimneys which are tested and approved for use at a flue gas temperature of not less than 1000°F., or insulating materials for fire endurance systems listed in the Fire Resistance Index published by Underwriters' Laboratories, Inc.

2. 'Vertical ducts.' Vertical concealed ducts that pass through any other area of the building, including suspended ceilings, in one- and 2-story buildings, shall be protected with insulating material as specified in subd. 1., or shall be located in 2-hour noncombustible fire-resistive enclosures.

Note: In buildings of 3 or more stories, vertical ducts shall be located in 2-hour noncombustible fire-resistive enclosures.

(g) *Exposed exhaust ducts.* Exposed exhaust ducts connected to hoods or canopies shall be located not less than 18 inches from combustible material unless the duct is protected in accordance with the requirements of par. (f).

(h) *Air discharge.* The air discharge shall be directed away from the roof or combustible materials.

(i) *Dampers.*

1. Fire dampers shall not be installed in kitchen exhaust duct systems unless the assembly includes an approved extinguishing system designed to operate with a fire damper in the closed position.

2. Dampers shall be accessible for cleaning and maintenance.

(6) AUTOMATIC SUPPRESSION SYSTEMS. Exhaust hoods and ducts in kitchens used for commercial purposes shall be protected by an approved automatic fire suppression system. The suppression system shall comply with the following:

(a) When the fire suppression system is activated, all gas and electrical sources serving cooking appliances, grease consuming appliances or fume incinerators and equipment associated with the hoods shall be automatically deactivated. Such gas and electrical sources shall not be capable of reactivation except by manual means after the fire suppression system has been serviced and is again ready for action;

When the fire suppression system is activated, all gas and electrical sources serving cooking appliances, grease consuming appliances or fume incinerators and equipment associated with the hoods shall be automatically deactivated. The exhaust fan is to remain in operation, however, unless the fire suppression manufacturer requires otherwise.

(b) 1. Except as provided in subd. 2., hood and duct suppression systems shall provide for both automatic and manual actuation of the system;

2. Automatic fire sprinkler systems using water need not be provided with means for manual actuation.

(c) A manual station for actuation of the suppression system shall be located at or near one of the means of egress from the area but not nearer than 10 feet to the range hood and shall be

securely mounted not less than 4 1/2 feet nor more than 5 feet above the floor, unless otherwise specifically approved by the chief of the fire department having jurisdiction;

(d) The system shall be maintained at full operating capacity by the owner and shall be serviced every 6 months; and

(e) All nozzles shall be accessible for cleaning and replacement.

(7) SUPPLY DUCTS TO HOODS. Kitchen hood supply ducts shall meet SMACNA gauge steel thicknesses. Exhaust hood assemblies with integrated air supply plenums shall be designed and provided with a fire-actuated damper as specified in NFPA 96.

COMM 64.68 SEASONAL OCCUPANCIES.

When approved in writing by the department, heating requirements may be waived but not ventilation required by s. COMM 64.05, Table 1 during the period of May 15 through September 15 for the following or similar occupancies: drive-in eating places, club houses, outdoor toilets, camp lodge buildings, canning factories and migrant labor camps.

Note: Rules on migrant labor can be found in ch. Comm 301.

Chapter COMM 65

Final Draft

CONSTRUCTION SITE EROSION CONTROL

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This is the draft of the soil erosion control submitted to the Legislature for approval as of November 1998. It is subject to possible change and its effective date has not been set. There are additional provisions in Ch. Comm 50 which are ***not*** *reflected in this edition of the Commentary due to the possibility of revisions. Consult the* Wisconsin Building Codes Report *for updates*

Subchapter I — Introduction

COMM 65.01 PURPOSE.

This chapter establishes minimum statewide practices and inspection procedures for soil erosion control at the construction sites of public buildings and places of employment.

COMM 65.02 SCOPE.

This chapter applies to all land disturbing construction activities that disturb more than 2,000 square feet of surface and that are associated with the construction or alteration of public buildings and buildings that are places of employment falling within the scope of chs. Comm 50 to 64, Comm 66 or Comm 70.

Note: For storm water management requirements after construction is completed, see ch. NR 216 administered by the Wisconsin department of natural resources.

COMM 65.03 DEFINITIONS.

In this chapter:

(1) **"Building construction activity"** means any activity covered under chs. Comm 50 to 64, Comm 66 and Comm 70 associated with the physical construction or alteration of a building.

(2) "**Channelized flow**" means a concentrated flow condition where runoff is restricted to a defined pathway, such as a drainage ditch.

(3) "**Check dam**" means a low structure, dam or weir placed across a channel to control water velocity.

(4) "**Construction site**" means an area where land disturbing construction activity takes place, including areas for parking lots, access drives, walkways and utility work, due to the construction or alteration of a public building or a place of employment.

(5) "**Department**" means the department of commerce.

(6) "**Design storm**" means a selected rainfall pattern of 24-hour duration with a specified amount and frequency that is used as the basis for design of erosion control measures.

(7) "**Enforcing agent**" means any one of the following:

(a) A municipality enforcing this chapter.

(b) A person certified under ch. Comm 5 for the purpose of enforcing this chapter.

(c) A person authorized by the department for the purpose of enforcing this chapter.

(8) "**Engineered practice**" means any erosion control practice that has been designed or sized based on a 10-year, 24-hour design storm, including diversionary measures or sediment traps or basins.

(9) "**Land disturbing construction activity**" means any activity associated with the physical construction of a building which is covered under chs. Comm 50 to 64, Comm 66 and Comm 70 that entails a change to the land surface that could lead to increased soil erosion and transport of sediment into public sewer inlets or the waters of the state.

(10) "**Mechanical erosion control measure**" means any type of erosion control not using living vegetation.

(11) "**Municipality**" means any city, town, village, or county in the state.

(12) "**Person**" means an individual, owner, operator, corporation, partnership, association, municipality, interstate agency, state agency, or federal agency.

(13) "**Place of employment**" has the meaning given in s. 101.01 (11), Stats.

Note: Section 101.01 (11), Stats., reads: "Place of employment" includes every place, whether indoors or out or underground and the premises appurtenant thereto where either temporarily or permanently any industry, trade or business is carried on, or where any process or operation, directly or indirectly related to any industry, trade or business, is carried on, and where any person is, directly or indirectly, employed by another for direct or indirect gain or profit, but does not include any place where persons are employed in private domestic service which does not involve the use of mechanical power or in farming. "Farming" includes those activities specified in s. 102.04 (3), and also includes the transportation of farm products, supplies or equipment directly to the farm by the operator of said farm or employes for the use thereon, if such activities are directly or indirectly for the purpose of producing commodities for market, or as an accessory to such production. When used with relation to building codes "place of employment" does not include an adult family home , as defined in s. 50.01 (1), or, except for the purposes of s. 101.11, a previously constructed building used as a community-based residential facility, as defined in s. 50.01 (1g), which serves 20 or fewer unrelated residents.

(14) "**Public building**" has the meaning specified under s. 101.01 (12), Stats.

Note: Section 101.01 (12), Stats., reads: "Public building" means any structure, including exterior parts of such building, such as a porch, exterior platform or steps providing means of ingress or egress, used in whole or in part as a place of resort, assemblage, lodging, trade, traffic, occupancy, or use by the public or by 3 or more tenants. When used in relation to building codes, "public building" does not include a previously constructed

building used as a community-based residential facility as defined in s. 50.01 (1g) which serves 20 or fewer unrelated residents or an adult family home, as defined in s. 50.01 (1)

(15) **"Responsible party"** means an agent designated by the owner to act on the owner's behalf and to fulfill the responsibilities of the owner under this chapter.

(16) **"Sheet flow"** means a non-concentrated flow condition where runoff flows in a planar sheet as opposed to being concentrated in a channel.

(17) **"Soil erosion"** means the detachment and movement of soil or sediment by water, wind, ice or gravity.

(18) **"Stabilization"** means the process of minimizing the soil erosion potential of a construction site.

(a) **"Temporary stabilization"** means a practice designed to minimize soil erosion for a time period of one year or less, that is generally removed in order to perform further construction activities or to permanently stabilize the construction site.

(b) **"Permanent stabilization"** means a practice designed to minimize erosion for a long, indefinite period after land disturbing construction activities have ceased on the construction site.

(19) **"Tackifier"** means a chemical substance used to bind mulch in order to prevent displacement.

(20) **"Waters of the state"** means those portions of Lake Michigan and Lake Superior within the boundaries of Wisconsin, all lakes, bays, rivers, streams, springs, ponds, wells, impounding reservoirs, marshes, water courses, drainage systems and other surface water or groundwater, natural or manmade, public or private within the state or under its jurisdiction, except those waters which are entirely confined and completely retained on the property of a person.

COMM 65.035 ADOPTED STANDARDS.

(1) **CONSENT.** Pursuant to s. 227.21, Stats., the attorney general and the revisor of statutes have consented to the incorporation by reference of the standards listed in sub. (3).

(2) **COPIES.** Copies of the adopted standards are on file in the offices of the department, the secretary of state and the revisor of statutes. Copies of the standards may be purchased through the respective organizations listed in Table 65.035.

(3) **ADOPTION.** The standards referenced in Table 65.035 are hereby incorporated by reference into this chapter.

TABLE 65.035

ADOPTED STANDARDS

ASTM	American Society for Testing and Materials 100 Barr Harbor Drive West Conshohocken, PA 19428
Standard Reference Number	Title
1. D 4355-92	Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
2. D 4491-96	Test Methods for Water Permeability of Geotextiles by Permittivity
3. D 4632-91	Test Method for Grab Breaking Load and Elongation of

	Geotextiles
4. D 4751-95	Test Method for Determining the Apparent Opening Size of a Geotextile

Subchapter II — Administration and Enforcement

COMM 65.04 MUNICIPAL ORDINANCES.

(1) Pursuant to s. 101.1205 (5m), a municipality may continue to administer and enforce a local ordinance related to soil erosion control at construction sites of public buildings and places of employment if the ordinance meets both of the following conditions:

(a) The standards in the ordinance are more stringent than the standards of this chapter.

(b) The ordinance was in effect on January 1, 1994.

(2) Nothing in this chapter shall prevent a municipality from any of the following:

(a) Employing a credentialed commercial building inspector or credentialed soil erosion inspector to administer and enforce this chapter, whether or not the municipality is certified under ss. Comm 50.21 or Comm 66.24.

(b) Instituting additional administrative or enforcement requirements such as plan review, permitting, or inspecting and charging fees to cover the costs of those requirements.

COMM 65.045 CERTIFICATION OF INSPECTORS.

Inspections performed for the purpose of administering and enforcing this chapter shall be performed by a person credentialed in accordance with ch. Comm 5 as a soil erosion inspector or commercial building inspector.

COMM 65.05 OWNERS RESPONSIBILITY.

The building owner or responsible party is responsible for meeting all requirements of this chapter including:

(1) Completing and submitting the site information form required under s. Comm 65.06.

(2) Preparing a soil erosion control plan for each site prior to submitting the site information form required under s. Comm 65.06 (3).

Note: Section Comm 65.07 requires a certified erosion control planner or other registered professional to develop the soil erosion control plan for a class I site.

(3) Maintaining a copy of the soil erosion control plan at the construction site.

(4) Implementing erosion control measures according to the plan.

(5) Notifying the inspection agency when a site under a stop work order has been brought into compliance.

(6) Performing the erosion control monitoring required under s. Comm 65.10.

(7) Permanently stabilizing the site within 7 days after the final grade is established as required under s. Comm 65.23.

(8) Submitting a copy of the soil erosion control plan to the enforcing agent on request.

COMM 65.06 SITE CLASSIFICATION.

(1) **CLASS I.** Construction sites shall be classified as class I when the total area of all land disturbance, including all phases of construction, is 5 or more acres.

(2) CLASS II. Construction sites shall be classified as class II when the total area of all land disturbance, including all phases of construction, is less than 5 acres.

(3) SITE INFORMATION FORM. The owner or responsible party shall submit the completed site information form along with the filing fee specified in s. Comm 2.32 to the department prior to any land disturbing construction activity.

Note: See appendix for an example of the information needed to complete the site information form, form SBD 10376.

Note: The filing fee as of **[the effective date of this chapter REVISOR INSERTS DATE]** specified in s. Comm 2.32 is forty dollars.

COMM 65.07 PLAN DEVELOPMENT REQUIREMENTS FOR CLASS I SITES.

The soil erosion control plan for a class I construction site shall be developed in accordance with this chapter by a person holding one of the following:

(1) A credential issued by the department as a certified erosion control planner.

Note: See s. Comm 5.315 for requirements.

(2) A registration issued by the department of regulation and licensing in one of the following categories:

(a) Architect.

(b) Professional engineer.

(c) Landscape architect.

(3) A certification issued by the department of agriculture, trade and consumer protection as an agricultural engineering practitioner.

Note: See s. ATCP 50.95 for requirements relating to agricultural engineering practitioners.

COMM 65.075 PLAN REVIEW PROCESS.

(1) The erosion control plan shall be available at the construction site for review.

(2) Plans may be submitted to the department for an in-office review. Fees in accordance with s. Comm 2.32 shall be submitted.

Note: Section 65.04 (2) allows municipalities to institute plan review, inspection or permitting activities and charge fees to cover the costs of those activities.

COMM 65.08 GENERAL PLAN REQUIREMENTS.

(1) ALL SITES. The soil erosion control plan for all construction sites under the scope of this chapter shall show all of the following:

(a) A narrative description of the site and the nature of the construction activity.

(b) The location of all existing and proposed roadways, buildings, surface waters and the limits of clearing and grading on the site with respect to property lines.

(c) Drainage patterns before and after land disturbing construction activities.

(d) Erosion control measures, including placement, installation details and materials used.

(e) The total area of the construction site and the total area which is expected to be disturbed by construction activities.

(f) A description of the intended sequence of major activities which disturb soils for major portions of the construction site, such as grubbing, excavation, or grading.

(g) A proposed schedule of intended soil disturbing activities.

(h) A description of proposed stabilization methods.

(2) ADDITIONAL REQUIREMENTS FOR CLASS I SITES. In addition to the requirements listed in sub. (1), plans for Class I construction sites shall show all of the following:

(a) Data describing the surface soil and subsoils planned to be exposed. For the purposes of this section, subsoils shall be the B horizons in soils with distinct profiles or, in soils with weak profiles, the soil below which roots do not normally grow.

(b) 1. The existing and proposed topography and drainage patterns, roads and surface waters, drawn to a scale of at least 1 inch = 50 feet, with contours shown at 2-foot intervals for areas with slopes less than 20 percent and contours shown at 5-foot intervals in areas where slopes are 20 percent or greater.

2. The topographical information shall extend 200 feet beyond the disturbed area or to the property line, whichever is less.

(c) Cross sections of channels designed to convey concentrated flows.

(d) A description of the method used for sizing any engineered erosion control practices.

(e) The name and identification number of the certified erosion control planner or the name and registration number of the architect, professional engineer, land surveyor, or landscape architect that created the plan.

COMM 65.09 PLAN CHANGES FOR CLASS I SITES.

The owner or responsible party shall obtain the approval and signature of a person certified or registered in accordance with s. Comm 65.07 prior to making any of the following changes to the soil erosion control plan of a class I construction site:

(1) A phasing change that affects the land disturbance.

(2) A substitution for an engineered erosion control practice.

(3) An alteration to the seeding plan which eliminates temporary seeding.

(4) Eliminating or decreasing the size of sediment traps, basins, berms, stone outlets, or size and type of stones or piping.

(5) Grading changes that extend grading beyond previously designated limits.

COMM 65.10 MONITORING BY THE BUILDING OWNER OR RESPONSIBLE PARTY.

The building owner or responsible party shall monitor the soil erosion control measures for structural failure at least weekly and anytime there is rainfall that exceeds 0.5 inches in a 24-hour period.

COMM 65.11 EMERGENCY SITUATIONS.

When the failure of erosion control measures results in an immediate threat of displaced soil entering adjacent properties, public sewers or the waters of the state, procedures shall be implemented immediately to repair or replace the measures to a code-compliant state.

COMM 65.12 VIOLATIONS AND PENALTIES

(1) NOTICE OF NONCOMPLIANCE.

(a) *Notification.* Upon finding of noncompliance, the enforcing agent shall notify the owner and the responsible party, in writing, of the violations to be corrected.

(b) *Timing of orders.* The enforcing agent shall order all cited violations of erosion control requirements under this chapter corrected within 72 hours after notification.

Note: The sediment cleanup requirements of s. Comm 65.22 (2) have different time limits and are unaffected by the 72-hour notice provision.

(c) *Stop work order.*

1. Pursuant to s. 101.1205 (6), Stats., failure to comply with an order issued in accordance with par. (b) may result in the issuance of a special order directing an immediate cessation of all construction work.

2. Construction work may resume when the conditions of the stop work order have been met.

(2) PENALTIES. Penalties for violations of this chapter shall be assessed in accordance with s. 101.02, Stats.

Note: Section 101.02, Stats., provides for fines of up to $100 for each violation of rules promulgated under this section. Each day of continued violation may constitute a separate offense.

COMM 65.14 PETITION FOR VARIANCE.

Petitions for variance to the requirements of this chapter may be submitted to the department in accordance with ch. Comm 3.

Subchapter III — Design Requirements

COMM 65.20 DESIGN REQUIREMENTS.

(1) Erosion control measures shall be planned and installed to minimize the erosion of disturbed soil and minimize the transport of soil offsite or into public sewer inlets or the waters of the state.

(2) Erosion control measures shall be planned, installed and maintained to remain in place and to function as designed for at least the duration of land disturbing construction activity up to the time of final site stabilization.

(3) Erosion control measures shall be planned, installed and maintained to remain in place and to function as designed when subjected to the forces of storm water and displaced soil associated with the appropriate design storm:

(a) Measures to minimize erosion resulting from overland flow shall be planned and installed to withstand the 2-year, 24-hour design storm for the county in which the construction site is located.

(b) Measures to minimize erosion resulting from channelized flow shall be planned and installed to withstand the 10-year, 24-hour design storm for the county in which the construction site is located.

(4) Rainfall amounts specified in Table 65.20 shall be used for designing these measures.

TABLE 65.20

RAINFALL IN INCHES FOR A 24-HOUR PERIOD

County	2 Year	10 Year	County	2 Year	10 Year
Adams	2.8	4.1	Marathon	2.7	4.0
Ashland	2.6	3.9	Marinette	2.4	3.6
Barron	2.7	4.1	Marquette	2.7	4.1
Bayfield	2.6	3.9	Menominee	2.5	3.7
Brown	2.5	3.7	Milwaukee	2.7	3.9
Buffalo	2.9	4.3	Monroe	2.9	4.2
Burnett	2.7	4.0	Oconto	2.4	3.7
Calumet	2.5	3.8	Oneida	2.5	3.8
Chippewa	2.7	4.1	Outagamie	2.5	3.8
Clark	2.8	4.1	Ozaukee	2.6	3.9
Columbia	2.8	4.1	Pepin	2.8	4.3
Crawford	3.0	4.3	Pierce	2.8	4.2
Dane	2.9	4.2	Polk	2.7	4.1
Dodge	2.8	4.0	Portage	2.7	4.0
Door	2.4	3.6	Price	2.6	4.0
Douglas	2.6	3.9	Racine	2.7	4.0
Dunn	2.8	4.2	Richland	2.9	4.3
Eau Claire	2.8	4.2	Rock	2.9	4.1
Florence	2.4	3.6	Rusk	2.7	4.1
Fond du Lac	2.6	3.9	St. Croix	2.8	4.2
Forest	2.4	3.7	Sauk	2.9	4.2
Grant	3.0	4.3	Sawyer	2.6	4.0
Green	3.0	4.2	Shawano	2.5	3.8
Green Lake	2.7	4.0	Sheboygan	2.5	3.8
Iowa	3.0	4.3	Taylor	2.7	4.1
Iron	2.5	3.8	Trempealeau	2.9	4.3
Jackson	2.8	4.2	Vernon	3.0	4.3
Jefferson	2.8	4.0	Vilas	2.5	3.8
Juneau	2.8	4.1	Walworth	2.8	4.1
Kenosha	2.8	4.0	Washburn	2.7	4.0
Kewaunee	2.4	3.7	Washington	2.7	3.9
La Crosse	2.9	4.3	Waukesha	2.7	4.0
Lafayette	3.0	4.3	Waupaca	2.6	3.9
Langlade	2.5	3.8	Waushara	2.7	4.0
Lincoln	2.6	3.9	Winnebago	2.6	3.9
Manitowoc	2.4	3.8	Wood	2.7	4.1

(5) If a site crosses the boundary between two or more counties, the county with the highest rainfall amounts shall be used for design purposes.

(6) Except as limited under this chapter, the department will accept practices installed and maintained in accordance with either of the following references as providing erosion control in accordance with this chapter:

(a) Chapter 3 of Wisconsin Construction Site Best Management Practice Handbook published by Wisconsin Department of Natural Resources.

(b) Chapter 10 of Facilities Development Manual published by Wisconsin Department of Transportation.

Note: Copies of Chapter 10 of Facilities Development Manual are available from Manual Development Engineer, Bureau of Highway Development, Room 651, P.O. Box 7916, Madison, WI, 53707. The cost as of the effective date of this chapter is $5, which must accompany the order. Copies of the Best Management Practice Handbook are available from the Department of Administration, Document Sales, P.O. Box 7840, Madison, WI, 53707. Phone (608) 266-3358 for information or 1-800-362-7253 for credit card orders.

COMM 65.21 GENERAL INSTALLATION REQUIREMENTS.

(1) GENERAL.

(a) All erosion control measures shall be constructed, maintained, and, if necessary, altered in accordance with this chapter.

(b) The erosion control measures shall be installed, used and maintained until the construction site is permanently stabilized.

(2) COMPLIANCE TIMES. Except for tracking pads, all planned erosion control measures shall be properly installed prior to the start of the current phase of land disturbing construction activities.

Note: See sub. (7) for tracking pad requirements.

(3) PERIMETER EROSION CONTROL MEASURES.

(a) Erosion control measures shall be placed between the area of soil disturbance and the downslope property lines as needed to contain soil that would otherwise be transported offsite.

(b) Downslope perimeter erosion control measures shall be installed prior to beginning upslope land disturbing activities.

(c) If vegetative barriers are used as perimeter erosion control measures, their use shall meet all of the following requirements:

1. The disturbed area upslope from a vegetative barrier shall have no slopes greater than 6%.

2. The area used for the barrier shall have no slope greater than 5%.

3. The barriers shall be at least 10 feet wide for every 50 feet of open ground draining to them.

4. An individual barrier may not be less than 25 feet wide in the direction of maximum slope.

5. If the barriers are driven on, become silt covered, or are otherwise rendered ineffective, other perimeter erosion control measures shall be used.

(5) FLOW IN CHANNELS. Velocity dissipation devices shall be placed at discharge locations and along the length of any receiving channels as necessary to prevent erosive flow from the site.

(6) SEWER INLET PROTECTION. Onsite sewer inlets that are downslope of the disturbed area and that discharge to a public storm sewer system or to waters of the state shall be protected with erosion control measures.

(7) SOIL TRACKING.

(a) *General.* Measures shall be provided to minimize the tracking of soil off the construction site.

(b) *Tracking Pad.* Where a tracking pad is used to minimize tracking, all of the following requirements shall be met:

1. The length of the pad shall be at least 50 feet measured from the property line where the street or sidewalk is accessed or the distance from the road to the disturbed area, whichever is less.

2. a. The width of the pad shall be at least 10 feet.

b. If it is necessary to have vehicles pass one another on the tracking pad, the pad shall be at least 20 feet wide.

3. a. The topmost layer of the tracking pad shall consist of at least 6 inches of 2- to 3-inch aggregate or equivalent.

b. If soils are at least 50% clay or silt, an appropriate geotextile liner shall be used to separate the aggregate from the soil below.

4. All vehicles entering or leaving the site shall use the tracking pad.

5. The tracking pad shall be installed within 24 hours after beginning land disturbing construction activity.

(8) SOIL STOCKPILES.

(a) Unstabilized soil stockpiles are considered to be disturbed soil.

(b) Soil stockpiles that are planned to be left undisturbed for 45 consecutive days or more shall be immediately protected with temporary stabilization measures or perimeter erosion control measures.

(c) Soil stockpiles may not be located in areas of concentrated flow.

(9) DEWATERING. If a site requires dewatering, measures shall be taken to minimize the transport of soil offsite.

Note: A pit dewatering permit may be required from the department of natural resources in accordance with ch. 283, Stats.

(10) APPROVED MATERIALS. When the following products are used for erosion control, the products shall meet the following requirements:

(a) *Silt fence fabric.* Fabric used in silt fencing shall meet all of the following requirements:

1. 'Grab strength'. A minimum grab strength of 450 newtons measured parallel and perpendicular to the manufacturing direction when tested in accordance with ASTM standard D 4632.

Note: 450 newtons is approximately equal to 100 pounds of force.

2. 'Ultraviolet stability'. A minimum retained tensile strength of 70% after 500 hours of exposure to ultraviolet light and water when tested in accordance with ASTM standard D 4355.

3. 'Apparent opening size'. A maximum apparent opening size of 0.6 mm, as determined by ASTM standard D 4751.

4. 'Water transmission rate'. A minimum permittivity of 0.05 sec^{-1} when tested in accordance with ASTM standard D 4491.

(b) *Matting, tackifiers and chemical soil stabilizers.* Materials used as matting, tackifiers or chemical stabilization shall be listed in the Wisconsin department of transportation erosion control product acceptability lists.

Note: See appendix for further information on the WISDOT erosion control product acceptability lists.

(1) GENERAL. All erosion control measures shall be monitored by the owner or responsible party and maintained in operating condition until the disturbed area is stabilized.

(2) SEDIMENT CLEANUP.

(a) Mechanical erosion control measures shall be cleared of sediment by the time the accumulation reaches 50% of the height of the control measure.

(b) Offsite sediment deposition occurring as a result of a storm event shall be cleaned up within 24 hours after the end of the storm event.

(c) All other offsite sediment deposition occurring as a result of construction activities shall be cleaned up by the end of the same work day.

COMM 65.23 CONSTRUCTION SITE STABILIZATION.

(1) GENERAL. Stabilization of construction sites shall be provided in accordance with this section. Stabilization methods include the following:

(a) Establishing perennial vegetation with a minimum coverage rate of 70% of the soil surface.

(b) Covering the soil with a hard surface such as concrete, bituminous material or riprap.

(c) 1. Using anchored mulch spread at a minimum depth of one inch.

2. The means of anchoring mulch include punching the mulch or using a tackifier.

3. When seed and mulch are planned to be used as final stabilization and final grade is established outside of the seeding or dormant seasons as shown in Table 65.23, anchored mulch without seeding shall be used.

(d) 1. Seeding and mulching.

2. Seeding and mulching shall be used only during the growing season or during the dormant season as shown in Table 65.23.

3. Temporary seeding during the growing season shall use an annual herbaceous plant, such as grass, that germinates within 10 days.

4. Temporary seeding during the dormant season shall use winter wheat or winter rye.

(e) Using a chemical soil stabilizer that is applied in accordance with the manufacturer's recommendations.

(2) TIMING.

(a) 1. Except as provided in subd. 2., the construction site shall be stabilized within 7 days after the final grade is established.

2. If more than 7 days will elapse between final grading and stabilization, perimeter erosion control measures and sewer inlet protection shall be maintained in place or shall be reinstalled.

(b) Disturbed soil that is planned to be left inactive for one year or more shall be treated as final grade and be permanently stabilized.

(3) STABILIZATION OF CHANNELS.

(a) If sod is used to stabilize a channel, it shall be staked to prevent movement.

(b) Vegetation may not be used as the sole means of final stabilization of channels if the 10-year 24-hour storm event will produce flow velocities greater than or equal to the following:

1. 3.0 feet per second for sand, silt, sandy loam and silty loam soils.
2. 4.0 feet per second for sandy clay loam and silty clay loam soils.
3. 5.0 feet per second for clay soils.

(c) Vegetation shall be established prior to using the channel as a control measure unless checkdams or other planned erosion control measures are installed to reduce water velocities and prevent channel erosion.

(d) Measures shall be taken to minimize the transport of suspended soil in channels prior to discharging the water from the site.

(4) STABILIZATION OF AREAS SUBJECT TO SHEETFLOW.

(a) *Seeding and mulching.*

1. Seeding shall be scheduled in accordance with Figure 65.23 and Table 65.23.



SEEDING SCHEDULE

Region	Growing Season	Dormant Season
North	5/1 to 9/6	11/1 to 3/20
Central	4/15 to 9/15	11/1 to 3/15
South	4/1 to 9/20	11/15 to 3/1

TABLE 65.23

2. Seeding shall be protected with mulch that is anchored in place by a tackifier or mechanical means.

3. If seeding is done during the dormant season, the site shall be reseeded during the following growing season as necessary to achieve a minimum soil coverage rate of 70%.

4. If final grade is established outside of the growing or dormant seasons, the soil shall be covered with anchored mulch prior to seeding.

(b) *Sod.*

1. Sod may be used any time of the year that conditions allow for establishment.

2. Except for use in channels, sod shall be staked to remain in place anytime the slope is greater than 4 to 1.

Note: Paragraph (3) (a) requires sod to be staked anytime it is used to stabilize a channel.

(5) STABILIZATION OF STEEP SLOPES USING VEGETATION. Fill slopes longer than 10 feet with a slope of 3 to 1 or more and cut slopes longer than 10 feet with a slope of 2 to 1 or more that use vegetation for stabilization shall incorporate one or more of the following practices:

(a) Erosion control matting is used in accordance with the manufacturer's recommendations.

(b) Sod is staked to prevent movement.

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Chapter COMM 66

UNIFORM MULTIFAMILY DWELLINGS

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Subchapter I — Administration and Enforcement

COMM 66.01 PURPOSE.

The purpose of this chapter is to establish uniform statewide construction standards and inspection procedures for multifamily dwellings in accordance with the requirements of ss. 101.14 (4m) and 101.971 to 101.976, Stats.

Note: This chapter cannot address every conceivable design option. Points of code application and clarification and formal code interpretations will be addressed and issued from time to time and will be published in the monthly *Wisconsin Building Codes Report* available from the Safety and Buildings Division, P.O. Box 7969, Madison, Wisconsin 53707.

QUESTION: *COMM 66 (the Uniform Multifamily Code) is a "uniform" code. What does this mean?*

ANSWER: *This means that the code is a "minimum-maximum" code. Municipalities generally may not enact stricter requirements than are listed in the code (with the qualified exceptions of a municipality being allowed to have certain pre-existing sprinkler ordinances and municipalities being able to enact zoning, land use, property line, and similar requirements). See COMM 66.04 for more specific information.*

QUESTION: *Do I need any other code books besides COMM 66 to prepare or review plans for code compliance?*

ANSWER: *Yes. As adopted by COMM 66, you will need the Commercial Building Code (COMM 66.60, 66.61, and 66.62 adopt COMM 51 through COMM 64, as well as COMM 69 for certain common areas) AND Volume 2, COMM 16 (which also adopts the National Electrical Code), AND the Wisconsin Plumbing Code, Chs. COMM 81 - 86).*

COMM 66.02 SCOPE.

(1) The requirements of this chapter apply to all of the following:

(a) Every multifamily dwelling as defined in s. COMM 66.03 which is constructed after April 1, 1995.

(b) Every addition to an existing multifamily dwelling which is constructed after April 1, 1995.

(c) Any building or portion of a building which is converted to a multifamily dwelling after April 1, 1995, except as provided in s. COMM 66.025.

(d) All remodeling or alteration which affects the structural strength, fire hazard, exits, or required natural lighting, or the replacement of major equipment, for a multifamily dwelling constructed after April 1, 1995. These requirements do not apply to minor repairs necessary for the maintenance of any building.

(2) Dormitories, rooming houses, and other places of abode that are within the scope of ch. COMM 57 are not included in the scope of this chapter.

(3) The scope of this chapter does not extend to driveways, sidewalks, landscaping, and other similar features not having an impact on a multifamily dwelling.

Note: Building inspectors and fire inspectors have separate responsibilities in the overall enforcement of this chapter. Normally, a building inspector has primary responsibility during construction of a building, while a fire inspector has primary responsibility after a building is completed.

QUESTION: *What residential occupancies (previously included in COMM 57) does COMM 66 Multifamily Code include?*

ANSWER: *COMM 66 covers any building with three or more attached dwelling units, including rowhouses, apartments, elderly housing, and similar non-transient residential multifamily occupancies up to 60 feet or six stories high.*

"Transient" residential commercial occupancies such as hotels, motels, and Community Based Residential Facilities previously included in COMM 57 are still covered by COMM 57. ***Multifamily occupancies over 60 feet or 6 stories in height are also covered under COMM 57.***

QUESTION: *If I am altering or adding to an existing apartment building that was previously reviewed under COMM 57, do I design the "new" work to COMM 57 or to COMM 66?*

ANSWER: Unless requested otherwise, we will review under Ch. 66. If review under Ch. 57 is requested, then it will be handled on a case-by-case basis with the following rationales:

ALTERATIONS: *Existing features will be "grandfathered" to the extent that they comply with the previous edition of Chapter 57 and those features are not degraded by the new work. The current edition of Chapter 57 would then be applied to review the "new" alteration work unless new dwelling units are being created as part of the work.*

ADDITIONAL LIVING UNITS: *When new dwelling units are created, they will be subject to Ch. 66. If the additional units result in the building exceeding ILHR 66.33-A thresholds, we will apply the area limits of Comm 66.33 and Table 66.33-A. Options to achieve compliance are to provide a sprinkler system, compartmentalize with 2 hour construction or divide the building into smaller sections with 4 hour fire division walls.*

COMM 66.02 Elderly Housing: *With the August 9, 1995, Emergency Rule, "elderly housing" was formally included in the scope of COMM 66. Please note Community Based Residential Facilities are still included in COMM 57 (as are hotels, motels, rooming houses, dormitories, and similar "transient" occupancies).*

COMM 66.02 Scope: *Code application for less than three living units in conjunction with a commercial use:*

The COMM 66.03 (6) definition of a multifamily dwelling is three or more attached dwelling units. State statutes indicate that a building with three or more tenants is governed by the commercial code. COMM 57.001 scope includes places of abode. Therefore, a residential occupancy, in conjunction with two or more commercial tenants, will be considered a Chapter 57 use until the building has three or more living units, in which case the residential occupancy will be a Chapter 66 use.

These three cases may occur:

a). One dwelling unit and one commercial tenant space: dwelling unit must comply with the Uniform Dwelling Code.

b). One dwelling unit and two or more commercial spaces or two dwelling units and one or more commercial spaces: dwelling units comply with current edition of COMM 57, rather than COMM 66, since three or more dwelling units are not involved.

c). Three dwelling units with or without attached commercial spaces: dwelling units shall comply with COMM 66.
It is important for designers to know that if dwelling units are added to a building in a) or b) above, resulting in three or more dwelling units within the building, then all the units must comply with COMM 66. Thus, it is advisable to initially design these units utilizing the most restrictive features of both COMM 57 and COMM 66. Keep this in mind also for hotels (COMM 57) which may be converted to condominiums (COMM 66) and vice versa for condominiums (COMM 66), where units may be rented as hotel rooms (COMM 57). The conversion of an COMM 57 hotel, dormitory, rooming house, etc., to an COMM 66 use is considered a change of use, so current code requirements apply.

COMM 66.02 NFPA 13 and 13R Sprinkler Systems: *Question: If an COMM 66 building that is sprinklered with a NFPA 13R system is proposed to be added to a Chapter 57 building which is sprinklered with a NFPA 13 system, then must a 4-hour fire-resistive wall separate the two areas?*

Answer. Yes. In this case, the more restrictive would apply to maintain the integrity of the NFPA 13 system.

COMM 66.02 (1) Additions and Alterations: *These will be administered the same way that additions and alterations to buildings constructed under older codes are presently handled.*

The new additions or alterations must satisfy COMM 66 requirements. Features of the existing buildings that met the code at the time of construction are "grandfathered" unless the new work activates an COMM 66 requirement. For instance, if the additional area of the new construction puts the building over the COMM 66 area or number of unit thresholds, then the entire building will have to be sprinklered.

The designer may also utilize COMM 66.33 (1) (d) and COMM 51.02 (13) to separate an existing building from the new addition by a 4-hour ***unpierced*** *building wall. This would allow the existing building to comply with the previous code and the addition to comply with COMM 66.*

COMM 66.02 (1)(c) Conversions: *After the effective date of this code, any conversion from a non-multifamily residence use to a multifamily residence shall comply with COMM 66 except for buildings complying with COMM 70, the Historic Building Code. Note that an existing COMM 57 building utilized as apartments, condominiums, elderly housing, or other uses included in the scope of COMM 66, are already multifamily dwellings therefore, it would not be considered a change of use when it is altered or enlarged.*

COMM 66.025 HISTORIC BUILDING CODE.

Buildings qualified under ch. COMM 70 as being historic and which are elected to be subject to that code are not required to conform to any of the provisions of this chapter which are addressed by ch. COMM 70.

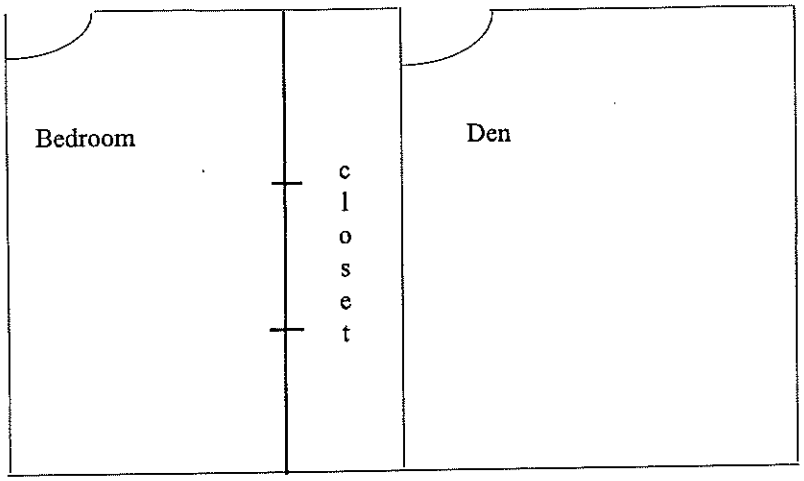
COMM 66.03 DEFINITIONS.

In this chapter:

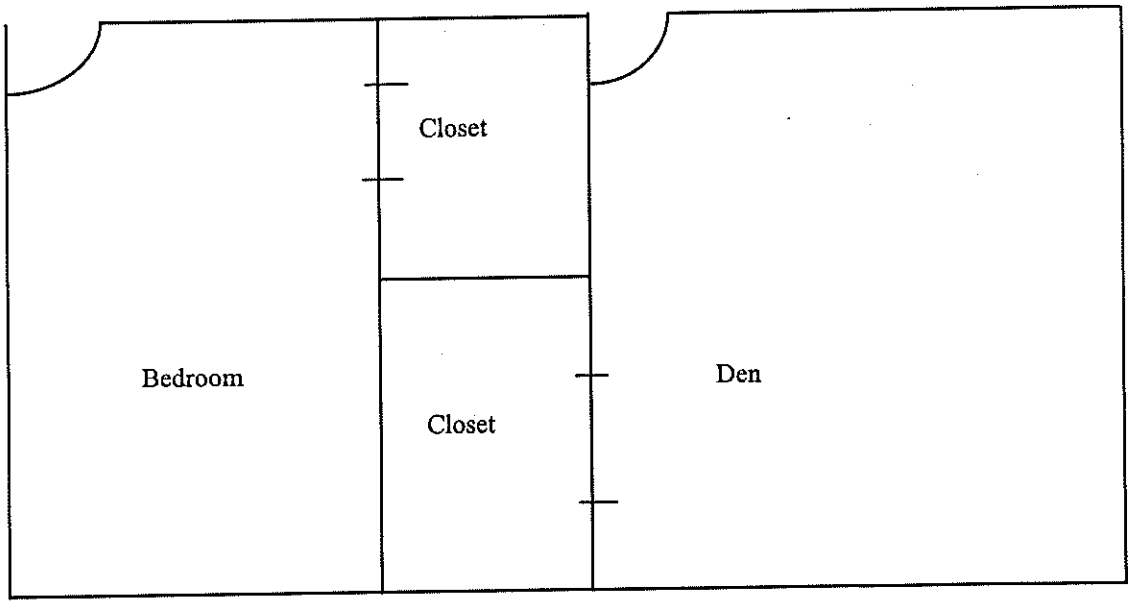
(1) "**Apartment building**" means any building containing 3 or more attached dwelling units, whether designated as apartment house, tenement, rowhouse, townhouse, garden apartment, or any other name.

(2) "**Bedroom**" means a room designed or intended to provide a space for sleeping, or a room designated as "study" or "den" that contains or is adjacent to a closet.

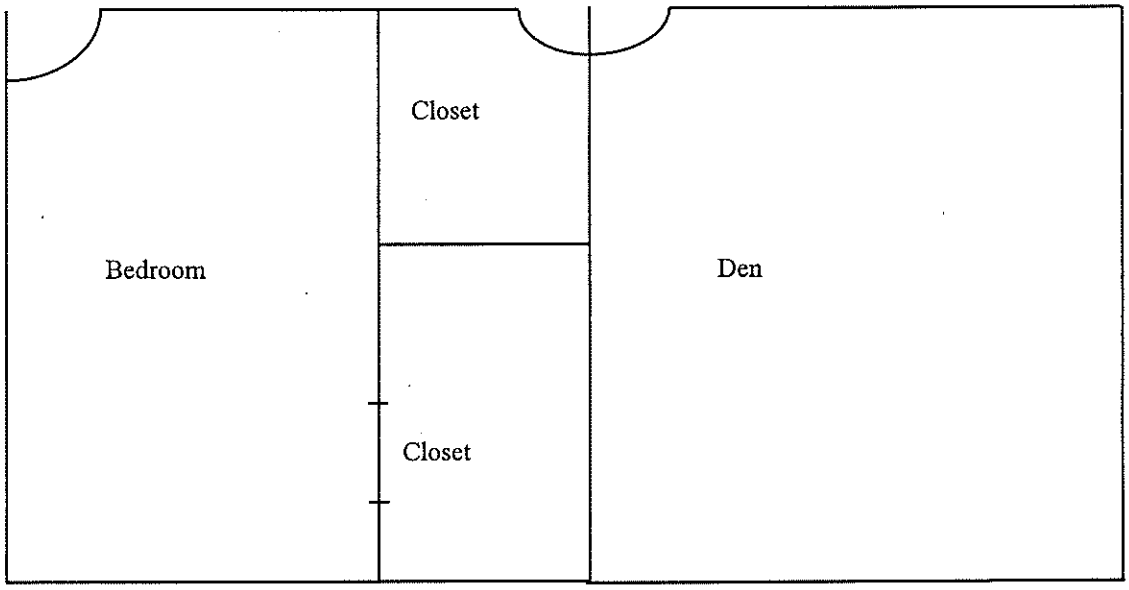
COMM 66.03 (2) Bedroom: *Includes room designated as study or den, etc., that contains or is adjacent to a closet. The intent of this section is to prevent people from circumventing code requirements by mislabeling a room likely to be used as a bedroom.*



Adjacent to a closet is not intended to consider closets already in bedroom as adjacent. In this instance, the closet is **not** adjacent to the den (so the "den" would **not** be considered a bedroom).



Closet is in the room, therefore the "den" is a bedroom.



Closet is adjacent to the "den," therefore the "den" is a bedroom.

(3) "Condominium" means a multifamily dwelling subject to condominium declaration under ch. 703, Stats.

(4) "Dwelling unit" has the meaning given in s. 101.61 (1), Stats.

(4m) "Housing for the elderly" means a residential occupancy building, the construction of which is financed by governmental agencies with occupancy limited to people meeting specific age or disability criteria as specified by the financing agency.

Note: Section 101.61 (1), Stats., reads in part: "Dwelling unit" means a structure or that part of a structure which is used or intended to be used as a home, residence or sleeping place by one person or by 2 or more persons maintaining a common household, to the exclusion of all others.

(5) "Loft" means a dwelling unit's upper room or floor that has at least 50% of the common wall open to the floor below.

COMM 66.03 (5) Loft: *To qualify as a loft, the area must be open to the floor below. At least 50 percent of the length of one common wall must be open to the floor below. Loft exiting criteria are included in COMM 66.345 (2).*

Additionally, a floor level greater than one-third of the level below is considered a story per COMM 51.02 (14).

(6) "Multifamily dwelling" has the meaning given in s. 101.971 (2), Stats.

Note: Section 101.971 (2), Stats., reads: "Multifamily dwelling" means an apartment building, rowhouse, town house, condominium or manufactured building, as defined in s. 101.71 (6), that does not exceed 60 feet in height or 6 stories and that consists of 3 or more attached dwelling units the initial construction of which is begun on or after January 1, 1993. "Multifamily dwelling" does not include a facility licensed under ch. 50.

Facilities "licensed" under ch. 50 will include licensed Community Based Residential Facilities (CBRF's), even if the CBRF includes "complete dwelling units". "Assisted Living Facilities" are ***not*** *considered "licensed" under ch. 50 of the State Statutes, and would be reviewed under COMM 66 (unless over 60 feet or six stories).*

Note: Section 101.71 (6), Stats., reads: (a) "Manufactured building" means any structure or component thereof which is intended for use as a dwelling and:

1. Is of closed construction and fabricated or assembled on-site or off-site in manufacturing facilities for installation, connection, or assembly and installation, at the building site; or

2. Is a building of open construction which is made or assembled in manufacturing facilities away from the building site for installation, connection, or assembly and installation, on the building site and for which certification is sought by the manufacturer.

(b) "Manufactured building" does not mean any manufactured home or mobile home under s. 101.91 or any building or open construction which is not subject to par. (a) 2.

(7) "**Municipality**" means any city, village, town, or county in this state.

(8) "**Nondwelling unit portions**" has the meaning given in s. 101.14 (4m) (a) 4., Stats.

Note: Section 101.14 (4m) (a) 4., Stats., reads: "Nondwelling unit portions" means the common use areas of a multifamily dwelling, including corridors, stairways, basements, cellars, vestibules, atriums, community rooms, laundry rooms or swimming pool rooms.

(9) "**Ramp**" means a sloping floor or walk and the necessary platforms or landings connecting them to form a continuous passage from one elevation to another.

(10) "**Rowhouse**" **and** "**Townhouse**" mean a building not more than 3 stories in height, arranged to accommodate 3 or more attached, vertically separated, side-by-side or back-to-back dwelling units, with each dwelling unit served by an individual exterior exit within 6 feet of the exit discharge grade.

See COMM 66.345(3)(e) for a special exiting exception that may be applied to an upper floor level of a rowhouse or townhouse. Please note that the vertical separation must extend from slab to roof deck with a continuous membrane.

(11) "**Stairway**" means one or more flights of steps and the necessary platforms or landings connecting them to form a continuous passage from one elevation to another.

(12) "**Two-hour fire resistance**" has the meaning given in s. 101.14 (4m) (a) 5m., Stats.

Note: Section 101.14 (4m) (a) 5m., Stats., reads: "Two-hour fire resistance" means 2-hour fire separations for all walls that separate dwelling units, exit corridors and exit stair enclosures and for all floors and ceilings, so that the specified walls, floors and ceilings are capable of resisting fire for a period not shorter than 2 hours.

COMM 66.04 QUESTION: *Is "2-hour fire resistance" in this code the same as the 2-hour vertical division walls in COMM 57?*

ANSWER: *No. The intent of the 2-hour fire resistance of COMM 66.02(12) is to completely compartmentalize each unit from each other and from any common corridors.*

(13) "**Type X gypsum wallboard**" means conforming to the type X specifications in ASTM C 36, as adopted by reference in s. COMM 51.25.

COMM 66.04 LIMITATIONS.

(1) MUNICIPAL ORDINANCES.

(a) Except as provided in pars. (b) to (d), no municipality may enact an ordinance on any subject falling within the scope of this chapter, including establishing restrictions on the occupancy of dwellings, for any reason other than noncompliance with the provisions of this chapter. This chapter does not apply to occupancy requirements occurring after the first occupancy for residential purposes following the final inspection.

(b) This chapter may not be construed to affect local requirements relating to land use, zoning, property line requirements, or other similar requirements. This chapter does not affect the right of municipalities to establish safety regulations for the protection of the public from hazards at a construction site.

(c) Any municipality may, by ordinance, require permits and fees for any construction, additions, alterations, or repairs not within the scope of this chapter.

(d) A municipality may regulate the construction and installation of windows and doors in multifamily dwellings if the regulation is related to preventing illegal entry.

(e) Under subch.VI of ch. 101, Stats., only a municipality with a preexisting stricter sprinkler ordinance as specified under par. (g) may enact an ordinance requiring the automatic fire sprinkler system protection or 2-hour fire resistance specified in s. 101.14(4m)(d) and (e) Stats. Under s. 101.14(4m), Stats., no municipality may enact an ordinance specifying threshholds for sprinkler protection or fire resistance that differ from s. COMM 66.33(1)(a) or s.101.14(4m)(d) and (e), Stats. Specifying the threshholds in s.101.14(4m)(d) and (e) does not enable a municipality to depart from any other criteria or procedure in this chapter.

Note: See Appendix A for a tabular listing of the threshholds in s.101.14(4m)(d) and (e), Stats., and for a listing of municipalities that the department believes have a stricter sprinkler ordinance.

(f) A municipality may not require backflow protection for automatic fire sprinkler systems connected to plumbing systems except where specified in ch. COMM 82.

(g) This chapter does not affect municipal requirements contained in a "preexisting stricter sprinkler ordinance," as provided in s. 101.975 (3), Stats.

Note: Section 101.975 (3), Stats., reads: In this subsection, "preexisting stricter sprinkler ordinance" means an ordinance that fulfills all of the following requirements:

1. The ordinance requires an automatic sprinkler system in multifamily dwellings containing 20 or less attached dwelling units.

2. The ordinance was in effect on January 1, 1992, and remains in effect on May 1, 1992.

3. The ordinance does not conform to this subchapter and s. 101.02 (7m) or is contrary to an order of the department under ss. 101.01 to 101.25.

4. The ordinance is more stringent than the corresponding provision of this subchapter or s. 101.02 or the contrary provision of an order of the department under ss. 101.01 to 101.25.

If a political subdivision has a preexisting stricter sprinkler ordinance, that ordinance remains in effect, except that the political subdivision may amend the ordinance to conform to this subchapter and s. 101.02 (7m) and to be not contrary to an order of the department under ss. 101.01 to 101.25.

(2) LEGAL RESPONSIBILITY. The department or the municipality having jurisdiction may not assume legal responsibility for the design or construction of multifamily dwellings.

(3) RETROACTIVITY. The requirements of this chapter are not retroactive.

(4) INNOVATIVE DWELLINGS. No part of this chapter is intended to prohibit or discourage the construction of innovative multifamily dwellings, such as a building built below ground, a geodesic dome, a concrete building, a fiberglass building, or any other nonconventional structure, provided written approval from the department is obtained. Under this section, written approval from the department includes an acceptance through preliminary design consultation, plan review, petition for variance, official code interpretations, material approval, or other written forms of approval.

(5) CHANGE OF USE.

(a) If the use of an existing building is changed to a multifamily dwelling and the requirements of this chapter are more stringent than those for the previous use, the building shall be made to comply with the requirements of this chapter except as provided in this subsection.

(b) The requirements for the new use may be modified through written approval of the department.

(c) An existing building undergoing a change of use will not be required to comply with the barrier-free environment provisions of s.COMM 52.04 unless the building undergoes physical remodeling in accordance with the percentages established in s. COMM 57.79.

Note: These exceptions do not allow exemption from the standards in the federal Americans with Disabilities Act Accessibility Guidelines.

(d) If, upon inspection of an existing building, it is found that the use has changed and the building does not comply with the requirements of this chapter that were in effect at the time of the change, the building shall be made to comply with those requirements.

COMM 66.05 JURISDICTION.

(1) MUNICIPAL JURISDICTION. Pursuant to ss. 101.14 (4m) and 101.975, Stats., municipalities may exercise jurisdiction over the construction and inspection of new multifamily dwellings. Municipalities intending to exercise jurisdiction shall adopt this chapter in its entirety. No additional standards within the scope of this chapter may be adopted by the municipality unless specific approval has been granted by the department pursuant to s. COMM 66.27.

(2) DEPARTMENT JURISDICTION. Pursuant to s. 101.14 (4m), Stats., the department will administer and enforce this chapter in any municipality that has not adopted or is not covered by an ordinance in accordance with this section.

(3) UNIFORMITY. Pursuant to s. 101.972, Stats., this chapter shall be applied uniformly throughout the state. The responsibility for uniform interpretation and application of this chapter ultimately rests with the department. Pursuant to s. 101.972 and 101.974, Stats., the department may consult with the multifamily dwelling code council established under s. 15.227 (20), Stats., in applying or modifying this chapter.

COMM 66.05 Adoption of COMM 66 by Municipalities: *The Division is taking the position that municipalities which currently have ordinances adopting COMM 50-64 automatically have adopted COMM 66 by reference due to Chapter 50 code changes. It is advisable to have the municipal legal counsel review ss. COMM 66.24, COMM 66.04 and COMM 66.05 effects on any local ordinances which may be in conflict with COMM 66 and take any appropriate action required.*

COMM 66.06 DESIGNING REQUIREMENTS.

(1) DESIGN. Every new building or alteration to a building shall be designed in compliance with this chapter.

(2) BUILDINGS CONTAINING NOT MORE THAN 50,000 CUBIC FEET TOTAL VOLUME. The plans and specifications for every new building or alteration to a building, containing not more than 50,000 cubic feet total volume, or addition to a building in which the volume of the addition results in the entire building containing not more than 50,000 cubic feet total volume, may be prepared by a registered architect, engineer, designer, contractor, or an authorized agent.

(3) BUILDINGS CONTAINING MORE THAN 50,000 CUBIC FEET TOTAL VOLUME. The plans and specifications for every new building or alteration to a building, containing more than 50,000 cubic feet total volume, or addition to a building in which the volume of the addition results in the entire building containing more than 50,000 cubic feet total volume, shall be designed as follows:

(a) *Building or structural design.* The plans and specifications for the design of the building shall be prepared, signed, and sealed by a Wisconsin registered architect or engineer.

(b) *Heating, ventilating, and air conditioning design.* The plans and specifications for the heating, ventilating, and air conditioning system shall be prepared, signed, and sealed by a Wisconsin registered architect, engineer, or designer of heating, ventilation, and air conditioning systems.

(c) *Energy conservation design.* The plans and specifications for energy conservation design shall be prepared, signed, and sealed by a Wisconsin registered architect, engineer, or designer of heating, ventilation, and air conditioning systems.

(d) *Fire protection design.* The plans and specifications for a fire protection system shall be prepared, signed, and sealed by a Wisconsin registered architect, engineer, or designer of fire protection systems.

Note: See s. COMM 51.01 (139a) for definition of total volume.

Note: The above terms "registered architect, engineer, or designer" mean a registered architect, registered professional engineer, or designer as defined by the laws regulating the practice of engineering and architecture, as found in ch. 443, Stats. Designers are restricted to the specific limitations outlined in s. A-E 5.06. See s. A-E 2.02 for rules pertaining to signing, sealing, and dating of plans prepared by registered architects, registered engineers, or designers. In par. (D), "designer" also means a licensed automatic fire sprinkler contractor.

Note: According to s. 87.30, Stats., every building, structure, fill, or development that is placed or maintained within any flood plain is required to satisfy local or state regulations adopted pursuant to that section.

COMM 66.07 PLANS, SPECIFICATIONS, AND CALCULATIONS PREPARED OUTSIDE WISCONSIN.

(1) GENERAL. Plans, specifications, and calculations for multifamily dwellings under s. COMM 66.06 (3) may be prepared by an architect or engineer registered outside of the state of Wisconsin provided the conditions of this section are satisfied.

(2) REGISTRATION. The state agency or entity that registers the architect or engineer shall be an agency or entity recognized by the department of regulation and licensing as having equivalent standards for registration.

(3) SEAL. The plans, specifications, and calculations shall bear the signature and seal or stamp of a registered architect or registered engineer.

(4) CERTIFICATE. A certificate that is dated, signed, and sealed by an architect or engineer registered in Wisconsin shall be attached to the plans, specifications, and calculations. The certificate shall indicate that the plans, specifications, and calculations were prepared in a state other than Wisconsin by an architect or professional engineer registered in that state; describe the work performed by the Wisconsin registered architect or engineer; state that the plans and specifications have been reviewed and comply with this chapter; and state that the reviewing architect or engineer will be responsible for the supervision of the construction in accordance with the requirements in s. COMM 66.09.

COMM 66.09 SUPERVISION.

(1) GENERAL. All constructions or installations under s. COMM 66.06 (3) shall be supervised by a Wisconsin registered architect or engineer except that Wisconsin permitted designers may supervise the installation of components or systems within the field of their permit. The person responsible for supervision shall also be responsible for the construction and installation being in substantial compliance with the approved plans and specifications. If the supervising architect, engineer, or designer observes a nonconformance to this chapter during or at the end of construction, the supervising individual, together with the designing architect, engineer, or designer, shall effect compliance or notify the department or its authorized representative of the noncompliance.

(2) DUTIES. Supervision of construction is a professional service, as distinguished from superintending of construction by a contractor, and includes the performance or the supervision thereof of reasonable on-the-site observations to determine that the construction is in substantial compliance with the approved plans and specifications.

(3) NAME OF SUPERVISING ARCHITECT, ENGINEER, OR DESIGNER. Prior to the start of construction, the owner of the building, whose name must be a part of or accompany all plans submitted for approval, or an authorized agent, shall designate in writing to the department or its authorized representative the name and Wisconsin registration number of the architect, engineer, or designer retained to supervise construction of the building or structure.

(4) COMPLIANCE STATEMENT. Prior to initial occupancy of a new building or addition, and prior to final occupancy of an alteration of an existing building, the supervising architect, engineer, or designer shall file a written statement with the department certifying that, to the best of his or her knowledge and belief, construction of the portion to be occupied has been performed in substantial compliance with the approved plans and specifications. This statement shall be on a form prescribed by the department. In a municipality administering this chapter, a copy of this statement shall be filed with the municipality.

Note: See Appendix A for an example of the compliance statement form (SBD-9720).

COMM 66.10 OWNER'S RESPONSIBILITY.

No building owner may construct or alter any building or portion of a building, or permit any building to be constructed or altered, except in compliance with this chapter. Compliance with this section does not relieve the building owner from compliance with the administrative rules established in other codes.

Note: Section COMM 66.06 (3) specifies which plans and specifications must be prepared by a registered architect, engineer, or designer. Section COMM 66.09 (1) specifies which construction must be supervised by a registered architect, engineer, or designer. Section COMM 66.09 (3) specifies the building owner's responsibilities in informing the department of the construction supervisor. Section COMM 66.09 (4) specifies the requirements for filing compliance statements prior to occupancy. Section COMM 66.12 requires submittal of a building permit application form, and that form must be signed by the building owner or other applicant. Section COMM 66.14 specifies the requirements for plan submittal and approval. Section COMM 66.15 requires submittal of a plans approval application form, and that form must be signed by the building owner.

COMM 66.11 WISCONSIN UNIFORM MULTIFAMILY BUILDING PERMIT.

A building owner or authorized agent shall obtain a Wisconsin uniform multifamily building permit from the municipality administering and enforcing this code before any on-site construction within the scope of this code is commenced, including excavation for a building, except where a footing and foundation approval has been issued under s. COMM 66.17 or where a permit to start construction has been issued under s. COMM 66.18.

Note: This section and s. COMM 66.12 can be disregarded where no municipality administers and enforces this chapter.

Note: Section 66.036, Stats., prohibits issuance of building permits by municipalities for structures requiring connection to a private domestic sewage treatment and disposal system unless the system satisfies all applicable requirements or all necessary permits for such system have been obtained.

COMM 66.11 Application Form: *COMM 66.11 and COMM 66.12 specify that the application form shall be obtained from the department or the municipality may create a form which includes all the information prescribed by the department. The Commercial Building Code application SB-118 will be considered the form satisfying the requirement for the time being. The form will be periodically revised to incorporate features desired by the Code Council and other features developed to streamline and coordinate Safety and Building processes.*

Note that if disturbing more than five acres (which can occur when multiple buildings at the same site are simultaneously under construction), the Notice of Intent is required until such time that formal soil erosion rules are adopted and in place.

COMM 66.11 and COMM 66.12 Permit Card: *The intent is to allow the municipality to decide if they want a card posted at the construction site and to choose what information they want on the card. A uniform card is not required.*

COMM 66.12 PROCEDURES FOR OBTAINING A UNIFORM MULTIFAMILY BUILDING PERMIT.

(1) APPLICATION FOR A WISCONSIN UNIFORM MULTIFAMILY BUILDING PERMIT. Application for a Wisconsin uniform multifamily building permit shall be on a form obtained from the department or on a form obtained from the municipality administering and enforcing this chapter. Forms provided by the municipality shall include all the information prescribed by the department. No application may be accepted that does not contain all the information requested on the form.

Note: See Appendix A for an example of the Wisconsin uniform multifamily building permit (SBD-9886) and an example of the department's plans approval application form (SBD-118), which includes prescription of the data pertinent to multifamily dwellings.

Note: Section 101.973 (5) requires the department to collect and publish data secured from multifamily building permits.

Note: Any municipality exercising jurisdiction may require reasonable supplementary information not contained on the Wisconsin multifamily building permit application.

(2) FILING OF A WISCONSIN UNIFORM MULTIFAMILY BUILDING PERMIT APPLICATION. A Wisconsin uniform multifamily building permit application shall be filed with the municipality administering and enforcing this chapter or its authorized representative.

(3) PERMIT FEES. The municipality shall, by ordinance, determine fees to cover expenses for issuance of the Wisconsin uniform multifamily building permit. Fees shall be submitted to the municipality when a Wisconsin uniform multifamily building permit application is filed there.

(4) ISSUANCE OF PERMITS. A Wisconsin uniform multifamily building permit shall be issued if the department and municipal requirements for filing and fees are satisfied and the plans have been conditionally approved. The municipality may require a building permit card to be posted in a conspicuous place at the dwelling site. The permit shall expire 2 years after issuance if the dwelling exterior has not been completed, unless the permit has been extended by the municipality or the department for a period of up to 2 years. A municipality issuing the permit

shall either send a copy of the application to the department or tally and transfer the data to the department in either written or electronic-based format.

(5) ACTION TO APPROVE OR DENY. Action to approve or deny a uniform multifamily building permit application shall be completed within 15 business days of receipt of all forms, fees, plans, and documents required to process the application. Denied applications shall include a written statement specifying the reasons for denial.

COMM 66.13 SUSPENSION OR REVOCATION OF WISCONSIN UNIFORM MULTIFAMILY BUILDING PERMIT.

The department or the municipality administering and enforcing this chapter may suspend or revoke any Wisconsin uniform multifamily building permit if it appears that the permit or plan approval was obtained through fraud or deceit, where the applicant has willfully refused to correct a violation order issued under s. COMM 66.23, or where the inspector is denied access to the premises. No construction may take place on a multifamily dwelling after suspension or revocation of a permit.

COMM 66.14 PLAN SUBMITTAL.

(1) TYPES OF PLAN APPROVAL. The following types of plans shall be submitted to the department or its authorized representative for examination and approval before construction for a multifamily dwelling is commenced:

(a) General building plans.

COMM 66.14 Additional Data Required for Plan Submittal: *In addition to the basic Commercial Code submittal requirements, the Department will require the submitter to convey additional items of information to the reviewing agency:*

1) *An area summary including number of dwelling units, total dwelling unit area, total non dwelling unit area, total building area, and building footprint area.*
2) *If the building is indicated as being partially sprinklered, the submitter must convey which areas are sprinklered and which are not. This can be done as a summary note, designation on the plans, a column on the room schedule, or other easily discernible method.*
3) *A Notice of Intent Form (see Plan Submittal Kit for current form) is required to be forwarded to the Department when 5 or more acres will be disturbed. (SEE COMM 50.115 FOR MORE INFORMATION). Note that the 5 or more acres applies to the entire developed site.*
4) *Effective with 10/98 version of the application form, you will find a worksheet to list multiple buildings that are being submitted for review and approval under the same transaction number. This form allows submittal of a single application form for multiple buildings (provided all the buildings were properly scheduled for review under a single transaction number, are all located on the same "site", and are shown on the same bound planset). Previously, separate application forms were required for each building. Identical buildings submitted under the same transaction number are still subject to a reduced fee according to the current fee schedule.*

(b) Structural plans.

(c) Heating and ventilating plans.

(d) Data and information relative to the requirements of chs. COMM 63 and 64, for the replacement of a major piece of heating or air conditioning equipment.

(e) Alteration plans for existing buildings except for those alterations involving changes in interior finishes only.

(f) Footing and foundation plans.

(g) Fire escape plans.

Note: See s. COMM 66.24 (5) for plan submittal procedures in certified municipalities.

Note: Section 101.12 (3) (h), Stats., prohibits local issuance of permits or licenses for construction or use of public buildings until drawings and calculations have been examined and approved by the department or its authorized representative.

(2) PLANS AND SPECIFICATIONS.

(a) *General.*

1. At least 4 complete, bound sets of plans, which are clear, legible, and permanent copies, and one copy of specifications shall be submitted to the department. The plans shall be bound in a manner that enables them to be reviewed without removing the binding.

2. All plans shall contain the address of the building, the name of the building owner, and the name of the person who prepared the plans. Plans prepared by a registered architect, engineer, or designer shall be signed, sealed, and dated in accordance with s. A-E 2.02.

(b) *General building plans.*

1. 'Plot plan.'

a. The location of the building with respect to property lines, lot lines, adjoining streets, alleys, and any other buildings on the same lot or property shall be indicated on the plot plan. For recycling space designated adjacent to a building, as specified in s. COMM 52.24, the area and dimensions shall be indicated on the plot plan. A small-scale plot plan shall be submitted on an 8 1/2" x 11" sheet for projects containing multiple buildings. For purposes of this requirement, a plot plan does not have to be a certified survey map.

b. The site plan shall clearly indicate the location of a barrier-free accessible building and its accessible entrances; the exterior accessible route to, from, and between all accessible parking spaces; the size and location of accessible parking spaces; the gradient or slope information for all walks and ramps on accessible routes; any recreational and public facilities and areas on the site; public transportation stops adjacent to the property; sidewalks; public streets, if the site plan is not on the same sheet as the plot plan; and, if provided, passenger loading zones.

2. 'Floor plans.' Floor plans shall be provided for each floor. The size and location of all rooms, doors, windows, fire walls, toilet facilities, structural features, exit passageways, exit lights, fire alarms, standpipes, stairs, and other pertinent information shall be indicated. Schematic exit plans shall be provided for large buildings, indicating normal paths of egress.

3. 'Elevations.' The elevations shall contain information on the exterior appearance of the building; indicate the location and size of doors, windows, roof shape, chimneys, exterior grade, footings, and foundation walls; and include information about the exterior materials.

4. 'Sections and details.' Sections and details shall include information to clarify the building design.

5. 'Interior barrier-free design information.' The general building floor plans, elevations, and sections shall clearly show the following:

a. All barrier-free accessible routes through accessible buildings, facilities, tenant spaces, and living units.

b. The design and location of all interior and exterior ramps, including the gradient or slope information.

c. The areas of rescue assistance in multilevel buildings, including dimensions of the area and the fire-resistive construction details.

d. The location and type of mechanical vertical transportation equipment, such as elevators and lifts, and the shaft design.

e. The design of bathrooms, toilet rooms, and unisex toilet rooms, including door clearances; lavatory or vanity design; plumbing fixture mounting heights; turnaround spaces; clear spaces required for plumbing fixtures; and the size and arrangement of toilet compartments.

(c) *Heating, ventilating, and air conditioning plans.* Heating, ventilating, and air conditioning plans shall indicate the layout of the system, including location of equipment and size of all piping, ductwork, dampers, fire dampers, chimneys, vents, and controls. The quantity of outside air introduced to each zone and the quantity of supply air and exhaust air for each room shall be listed on the plans. The type of equipment and capacities shall be indicated on the plans or equipment schedules. Input and output capacities shall be included for heating equipment.

(d) *Specifications.* The specifications shall be properly identified with the drawings and describe the quality of the materials and the workmanship.

(e) *Schedules.* Schedules shall be provided which contain information pertinent to doors, room finishes, equipment, and the use of all rooms and number of occupants accommodated therein, unless this information is indicated on the plans.

Note: Original drawings are not considered a substitute for permanent copies.

Note: Duplicate information need not be submitted when heating, ventilating, air conditioning, and building plans are submitted simultaneously.

Note: For pit depth and overhead clearance requirements applicable to design of elevator hoistways, see ch. COMM 18, Elevator Code.

(3) DATA REQUIRED.

(a) *General.* All plans submitted for approval shall be accompanied by sufficient data and information for the department or its authorized representative to judge if the design of the building, the capacity of the equipment, and the performance of the system will meet the requirements of this chapter.

(b) *Structural data.*

1. Sample structural calculations, including the assumed bearing value of soil, live loads and itemized dead loads, unit stresses for structural materials, and typical calculations for slabs, beams, girders, columns, and trusses, shall be submitted. Typical wind and bracing calculations and diagrams, including the manner in which shear transfer is made between resisting elements, shall also be included. Complete structural calculations shall be furnished upon request of the department or other authorized approving official.

2. The building designer shall submit one copy of the following minimum information for structural components, such as wood trusses, precast concrete, laminated wood members,

steel joists, and steel girders, when the component fabricator is specified as being responsible for the component design:

a. Structural framing plan.

b. Bearing support and connection details of the component to the structure.

c. Design loads, including location and magnitude of uniform superimposed dead and live loads; concentrated dead and live loads; nonuniform snow loads; wind and bracing loads for each component system; and wind, bracing, and gravity forces required to be developed at interfaces with other materials.

d. Required fire rating.

e. Outside configuration of components.

f. Permanent bracing system.

3. The building designer shall also submit the following information with the initial building plan submittal or the component plan submittal:

a. A framing plan showing all members and labels, handling and erecting or other special installation instructions, and any required permanent bracing which was the basis for the component design.

b. Information regarding the member design of the following structural components: web configuration, stress diagram or tabulation of axial force in the members, member size, grade of lumber, fabricated splices, and member bracing, for wood trusses; web configuration, stress diagram or tabulation of axial force in the members, member size, steel yield, fabricated splices, and number bracing, for steel joists and joist girders subjected to nonuniform loading; specified concrete strengths, prestressing data including final effective forces and centroids, mild reinforcing including release and confinement steel, shear reinforcing, and stripping, transportation, and erection handling points, for precast concrete members; and species of wood, bending stress of wood, adhesive, and member sizes, for laminated wood members.

c. Information pertaining to the design of connections within or between like components for the following structural components: web and chord connection details and connector plate holding values, for wood trusses; web and chord connection details, for steel joists and joist girders subjected to nonuniform loading; bearing confinement steel, dapped end reinforcing, corbel reinforcing, bearing pads, and loose and embedded connection steel including welding and bolting requirements, for precast concrete members; and member connection and bearing details, for laminated wood members.

4. For the purposes of this paragraph, the department does not consider truss layout plans or truss erection plans as architectural practice or engineering practice, and therefore, such plans are not required to be signed and sealed or stamped in accordance with s. COMM 66.06 or 66.07.

5. Information regarding reinforcement, concrete strength, and fire resistive ratings for precast concrete components may be provided in either the specifications or calculations furnished with the precast concrete plans.

(c) *Energy conservation data.* Calculations and specifications that contain the details and data required by s. COMM 63.01 shall be submitted for the types of projects outlined in

s. COMM 63.001. The submittal shall be on forms provided by the department or other forms approved by the department.

Note: See A50.12 of the appendix of chs. COMM 50 to 64 for sample copies of forms.

On April 1, 1997, the Department adopted new lighting and energy conservation standards. Generally, lighting plans will be required to be submitted for common areas (interior and exterior lighting) where the lighting is powered by the building electrical service. (See COMM 63 for more information about what is covered under the new code – lighting within located within/controlled by individual dwelling units is typically exempt from review). The building thermal envelope must now comply with new energy conservation standards, and the designer may demonstrate compliance through use of software such as ComCheck EZ or several other methods explained in COMM 63 (optional worksheets are available in the Plan Submittal Kit).

(d) *Heating and ventilating data.* A description of the construction for the walls, floors, ceilings, and roof and the transmission coefficients of the construction materials shall be furnished. The calculations shall include heat losses for the individual rooms; transmission, infiltration, or ventilation losses, whichever are greater; and a summary of the total building heat loss expressed in BTU per hour or watts; heat gain calculations for air conditioning systems; ventilation calculations, including outside air requirements for each space and ventilation system expressed in cubic feet per minute or liters per second; and percent of outside air at minimum and maximum flow rates when the building is occupied.

Effective April 1, 1997, Table COMM 64.05 was altered to allow application of either 4% openable OR 30 cfm/room of mechanical ventilation in residential occupancies. Please note that if providing mechanical ventilation in a bedroom, at least one openable window or door complying with COMM 66.345(1) will still be required to provide the second means of egress from the sleeping room.

Note: If the code does not specify a required calculation method, the department will accept as the basis for calculations and design data the methods and standards recommended by the Mechanical Contractors' Association of America; the American Society of Heating, Refrigerating and Air-Conditioning Engineers; and the Institute of Boiler and Radiator Manufacturers.

(e) *Data for recycling space.* Verifiable data or calculations and specifications shall be submitted in accordance with s. COMM 52.24 for determining adequate space for the separation, temporary storage, and collection of recyclable materials.

(f) *Additional data.* When requested by the department or its authorized representative, additional data pertaining to design, construction, materials, and equipment shall be submitted for approval.

COMM 66.15 APPLICATION FOR APPROVAL.

A plans approval application form prescribed by the department and the fee specified in ch. COMM 2 shall be included with the plans submitted to the department. The department shall review and make a determination on an application for plan review within 15 business days of receipt of the application and all forms, fees, plans, and documents required to complete the review.

Note: See Appendix A for an example of the plans approval application form (SBD-118).

COMM 66.16 DEPARTMENT APPROVAL OF PLANS.

(1) **PLAN APPROVAL.** If the department determines that the submitted plans and application for approval substantially conform to this chapter and other legal requirements, an approval shall be issued. The plans shall be stamped "conditionally approved." At least one copy shall be

returned to the applicant and at least one copy shall be retained by the department. The conditions of approval shall be indicated in a letter to the applicant and the building owner. All conditions of the approval shall be met during construction.

COMM 66.16 Plan Review Actions: The intent is that the plan review is conducted the same way it is now for commercial buildings. Even though COMM 66.16 does not mention a "HOLD" action, it is an appropriate action to deal with easily correctable deficiencies.

(2) DISAPPROVAL OF PLANS. If the department determines that the plans or the application for approval do not substantially conform to this chapter, approval shall be denied. A written statement specifying the reasons for denial shall be sent to the applicant and to the building owner. Plans which do not substantially conform to this chapter shall be stamped "not approved." One copy shall be returned to the applicant and one copy shall be retained by the department.

COMM 66.165 REVISIONS TO APPROVED PLANS.

(1) All revisions and modifications which involve provisions of this chapter and which are made to plans or specifications that have previously been granted approval by the department or municipality shall be submitted to the department or municipality for review. Revisions or modifications to approved plans may be shown on 8 1/2- by 11-inch addendums to bound plans.

(2) All revisions and modifications to the plans shall be approved in writing by the department or municipality prior to the work involved in the revision or modification being carried out.

(3) A revision or modification to a plan, drawing, or specification shall be signed and sealed in accordance with s. COMM 66.06 (3) or 66.07, if applicable.

COMM 66.17 FOOTING AND FOUNDATION APPROVAL.

(1) The department or its authorized representative, as provided in s. COMM 66.24, may conditionally approve footing and foundation plans, to permit construction of footings and foundations prior to the examination and approval of the complete plans, upon submission of all of the following:

(a) The plans approval application form specified in s. COMM 66.15 or s. COMM 66.24 (5)(d) 3.b., whichever is applicable.

Note: See Appendix A for an example of the plans approval application form (SBDB-118).

(b) The fee specified in ch. COMM 2 or s. COMM 66.24 (7), whichever is applicable.

(c) At least 4 bound sets of footing and foundation plans which include a plot plan and which are signed and sealed in accordance with s. COMM 66.06 (3) or 66.07, if applicable.

(d) At least 1 set of all of the following:

1. Schematic floor plans indicating the exits.
2. Building elevations.
3. Itemized structural loads.
4. Structural footing and foundation calculations.

(2) The department or its authorized representative shall review and make a determination on an application for footing and foundation approval within 15 business days of receipt of the application and all forms, fees, plans, and documents required to complete the review.

COMM 66.18 PERMISSION TO START CONSTRUCTION.

(1) The department or its authorized representative, as provided in s. COMM 66.24, may grant a permission to start construction for the footings and foundations upon submission of the following:

(a) The plans approval application form specified in s. COMM 66.15 or s. COMM 66.24 (5)(d) 3.b., whichever is applicable.

Note: See Appendix A for an example of the plans approval application form (SBD-118).

(b) 1. At least 4 bound sets of building plans as specified in s. COMM 66.14 (2) or the number of copies required under s. COMM 66.24 (5)(d), whichever is applicable, and one copy of specifications, or

2. At least 4 bound sets of footing and foundation plans and the information specified in s. COMM 66.17 (1)(d).

(c) A written request by the building owner to start construction, on a form prescribed by the department.

(d) The fee specified in ch. COMM 2 or s. COMM 66.24 (7), whichever is applicable.

Note: See Appendix A for an example of the permission to start construction form (SBDB-198).

(2) Building owners who submit a permission to start construction form proceed at their own risk without assurance that a conditional approval for the building will be granted.

(3) The department or its authorized representative shall review and make a determination on an application for permission to start construction within 3 business days of receipt of the application and all forms, fees, plans, and documents required to complete the review.

COMM 66.19 EVIDENCE OF PLAN APPROVAL.

The architect, engineer, designer, builder, manufacturer, or building owner shall keep at the building site one set of plans bearing the stamp of conditional approval and a copy of the specifications. The plans shall be open to inspection by an authorized representative of the department or municipality.

COMM 66.195 SPRINKLER DOCUMENTS.

(1) PLANS.

(a) 1. Except as provided in subd. 2, where automatic fire sprinkler systems are to be installed or altered, sprinkler plans and specifications shall be present at the installation site and made available, upon request, to the department or municipality, and their authorized representatives.

2. a. When a project involves the alteration or addition of 20 or fewer sprinkler heads to an existing automatic fire sprinkler system, sprinkler plans and specifications shall not be required to be present at the installation site or made available unless required by local ordinance.

b. When sprinkler plans and specifications are not provided for a project involving the alteration or addition of 20 or fewer sprinkler heads to an existing automatic fire sprinkler system, the automatic fire sprinkler contractor responsible for the work shall provide a written description of the type and scope of the work. The description shall be included with the material and test certificate, if required. The description shall be made available, upon request, to the department or municipality, and their authorized representatives.

(b) The sprinkler plans at the installation site shall be:

1. Signed and sealed in accordance with s. A-E 2.02 by an architect, engineer, or sprinkler designer who is registered or permitted by the department of regulation and licensing; or

2. Signed, including license number, and dated by an automatic fire sprinkler contractor who is responsible for the installation of the sprinklers and who is licensed by the department.

(c) Where automatic fire sprinkler plans are required by local ordinance to be reviewed and approved by a local governmental agency or their agent, the sprinkler plans at the installation site shall bear evidence of that approval.

(d) The plans for the automatic fire sprinkler system to be at the installation site shall include at least:

1. The name of the:

   a. Owner of the building.

   b. Occupant or occupants in the building.

COMM 66.195 (1)(d) 1.b. Sprinkler Information: *The intent of the requirement is that the occupancy of the building or individual tenants will be identified for correlation with sprinkler design.*

2. The location or address of the building.

3. A full height cross section through the building.

4. The location within the building of:

   a. Partitions, walls, and fire walls.

   b. Concealed spaces, closets, attics, and bathrooms.

   c. Sprinklers.

   d. Alarms.

   e. Pumps, valves, drain pipes, and test connections.

   f. Pipe hangers and supports.

5. The occupancy class of each area or room within the building as defined in s. COMM 51.01 (87).

6. The sources of water supply, including the static pressure, residual pressure, the flow, and the dates and time of determination for each.

7. The location and size of:

   a. All aboveground and underground piping.

   b. Hose outlets.

8. The number of sprinklers on each riser per floor.

9. The relative elevations of sprinklers, junction points, and supply points.

(e) The specifications for the automatic fire sprinkler system to be at the installation site shall include at least:

1. The type of materials and devices that comprise the sprinkler system.

2. The settings of pressure reducing valves.

3. Type and amount of antifreeze solutions being employed, if any.

(2) SPRINKLER MATERIAL AND TEST CERTIFICATES.

(a) Where automatic fire sprinkler systems have been installed or altered, completed sprinkler material and test certificates shall be made available, upon request, to the department, its agent, or local governmental agencies exercising jurisdiction.

(b) A sprinkler material and test certificate shall provide at least the information as enumerated in s. 8-1 of NFPA 13 or s. 2-1 of NFPA 13R, as adopted by reference in s. COMM 51.25, depending upon the type of sprinkler system.

COMM 66.20 REVOCATION OF APPROVAL.

The department or municipality may revoke any approval that they issue under the provisions of this chapter, for any false statements or misrepresentation of facts on which the approval was based.

COMM 66.21 EXPIRATION OF PLAN APPROVAL AND EXTENSION OF PLAN APPROVAL.

(1) EXPIRATION OF PLAN APPROVAL.

(a) *Building shell.* Plan approval by the department or its authorized representative for new buildings and building additions shall expire 2 years after the approval date indicated on the approved building plans if the building shell is not closed in within those 2 years.

(b) *Occupancy.* Except as provided in sub. (2), plan approval by the department or its authorized representative for new buildings and building additions shall expire 3 years after the approval date indicated on the approved building plans if the building is not ready for occupancy within those 3 years.

COMM 66.21 Expiration of Plan Approval: *Note this section and COMM 50.17 were changed in a previous code edition to provide reasonable construction time limits. The building shell must now be enclosed within 2 years and be ready for occupancy within 3 years. The plan reviewing agency may extend the plan approval. The permitting agency may extend the permit based on local ordinances.*

(c) *Alterations.* Except as provided in sub. (2), plan approval by the department or its authorized representative for interior building alterations shall expire 1 year after the approval date indicated on the approved building plans if the alteration work is not completed within that year.

(d) *HVAC construction only.* Except as provided in sub. (2), plan approval by the department or its authorized representative for heating, ventilating, or air conditioning construction that does not include any associated building construction shall expire 1 year after the approval date indicated on the approved plans if the building or building area affected by the plans is not ready for occupancy within that year.

(2) EXTENSION OF PLAN APPROVAL. Upon request and payment of the fee specified in ch. COMM 2, the expiration dates in sub. (1) (b), (c), and (d) shall be extended for one 1-year period provided the request is submitted prior to expiration of the original approval.

Note: According to s. 66.05 (1) (a), Stats., the local governmental body or building inspector may order the razing of buildings or portions thereof, where there has been a cessation of normal construction for more than 2 years.

COMM 66.22 DESIGN RESPONSIBILITY.

A conditional approval of a plan by the department or municipality may not be construed as an assumption of any design responsibility.

COMM 66.23 INSPECTIONS.

(1) CERTIFICATION OF INSPECTORS. All inspections for the purpose of administering and enforcing this chapter, except for inspections performed by fire inspectors, shall be performed by a certified commercial building inspector. Certifications shall be in accord with the requirements in ch. COMM 5 for certified commercial building inspection.

*COMM 66.23 **Certification of Inspectors:** Comm 5 has been issued and includes COMM 66 under the Commercial Building Inspector Certification category. Thus, people with the Certified Commercial Building Inspector Credential are certified to inspect COMM 66 buildings.*

(2) REQUIRED INSPECTIONS. Inspections may be conducted by the department or the municipality administering and enforcing this chapter to determine whether the construction or installation conforms to the conditionally approved plans, the notice of conditional approval, the Wisconsin uniform multifamily building permit application, and this chapter.

Note: See Appendix A for an example of the inspection progress report form (SBD-224) and an example of the inspection report and orders form (SBD-2).

(3) NOTICE OF COMPLIANCE OR NONCOMPLIANCE. Upon an inspector's finding of noncompliance, the department or the municipality enforcing this code shall notify the applicant and the building owner in writing of the violations to be corrected. All cited violations shall be ordered corrected within 30 days after written notification unless an extension of time is granted pursuant to s. COMM 66.28.

COMM 66.24 CERTIFIED MUNICIPALITIES.

(1) GENERAL. This section establishes the manner under which municipalities may examine building plans and inspect multifamily dwellings.

*COMM 66.24 **Plan Review and Inspection by Municipalities:** There are no differences from the commercial code (COMM 50-64). Note that the revised COMM 50.21 (5) and the new COMM 66.24 (5) have changed the municipal building review limits to allow a volume or square foot basis. Inspections under COMM 66.24 (6) have no volume or square foot limits. Noncertified municipalities may adopt and enforce COMM 66, but must have a certified inspector performing the duties. COMM 66.04 (1) (a) states "this chapter does not apply to occupancy requirements occurring after first occupancy for residential purposes following the final inspection." This is intended to be applied the same as in the Uniform Dwelling Code. After the final inspection and the building is occupied, local maintenance codes may be imposed. Inspection for the maintenance codes may be done by noncertified inspectors.*

*Also note there is no intent to change the ability of municipalities to require sprinkler plan review (COMM 66.195) or who can be delegated to do the plan review **under municipal contract** in order to maintain control.*

(2) CONDITIONS OF PARTICIPATION.

(a) Before assuming the responsibilities of examining building plans and providing inspection services, a municipality shall comply with all of the conditions in pars. (b) through (h). While certified, the municipality shall comply with pars. (f), (h), (i), and (j).

(b) Notify the department in writing at least 30 days prior to the date upon which the municipality or county intends to assume the responsibilities.

(c) Adopt by ordinance or regulation the responsibilities of plan examination and building inspection.

(d) Adopt by ordinance or regulation this chapter in its entirety.

(e) Submit to the department a certified copy of all ordinances or regulations assuming the plan examination and building inspection responsibilities and adopting this chapter.

(f) Employ one or more certified commercial building inspectors to perform the plan examinations and building inspections.

(g) Receive from the department certification to perform the plan examinations and building inspections.

(h) Forward to the department any information requested by the department relative to the examination of plans and the inspections of buildings.

(i) Forward to the department any multifamily dwelling data collected from a city, village, or town that does not administer and enforce this chapter, as specified in sub. (5)(d) 3.b.

(j) Notify the department in writing at least 30 days prior to the date upon which the municipality intends to relinquish the responsibilities of examining plans or inspecting buildings.

(3) JURISDICTION.

(a) *Departmental.*

1. Nothing in this section prevents the department from conducting its own investigations or inspections, or from issuing orders relative to the administration and enforcement of this chapter.

2. The department shall administer and enforce this chapter in any municipality which has not assumed the responsibilities for plan examination and building inspection.

(b) *County.*

1. Ordinances enacted by a county for establishing county plan examination and building inspection functions shall apply to all cities, villages, or towns within that county which have not assumed those functions.

2. Ordinances enacted by a county for establishing county plan examination and building inspection functions may not prevent or prohibit any city, village, or town within that county from assuming those functions pursuant to sub. (2) at any time.

(4) CERTIFICATION OF INSPECTORS. Inspectors employed by municipalities to administer and enforce this chapter under sub. (2) shall be certified by the department in accordance with ch. Comm 5 as certified commercial building inspectors.

(5) PLAN EXAMINATION.

(a) *First class cities.* Drawings, specifications, and calculations for all multifamily dwellings except state-owned buildings, to be constructed within the limits of a first class city, shall be submitted to that city if that city has assumed the responsibilities of plan examination and building inspection.

(b) *Other municipalities.* Drawings, specifications, and calculations for all multifamily dwellings except state-owned buildings, to be constructed within the limits of a municipality other than a first class city, shall be submitted to that municipality if that municipality has

assumed the responsibilities of plan examination and building inspection, and if the plans are for any of the following:

1. A new building containing less than 5,000 square feet of total floor area.

2. An addition to a building where the area of the addition results in the entire building containing less than 5,000 square feet of total floor area.

3. An alteration of a space involving less than 10,000 square feet of total floor area.

Note: The department will allow use of 50,000 and 100,000 cubic feet of total volume in lieu of the thresholds of 5,000 and 10,000 square feet of total floor area, respectively, as established in s. 101.12 (3)(b), Stats., provided calculations showing that volume are included in the submittal to the municipality.

(c) *Project waiver.* A certified municipality may waive its jurisdiction for the plan review of a specific project, in which case plans and specifications shall be submitted to the department for review and approval.

(d) *Plan submittal procedures.*

1. A building permit application shall be included with the submitted plans.

2. At least 2 sets of complete building plans and one copy of specifications shall be submitted to the municipality having jurisdiction for examination. The municipality may by ordinance require submittal of additional copies of plans and specifications.

3. Building plans submitted to a municipality for examination shall include all of the following:

a. The information specified in s. COMM 66.14.

b. The department's plans approval application form specified in s. COMM 66.15, unless a municipally supplied form is submitted that includes the building owner's, designer's, and supervising professional's statements and signatures which are required on the department's form. Any municipally supplied plan approval application form for a multifamily dwelling in a city, village, or town that does not administer and enforce this chapter shall also include the multifamily dwelling data prescribed by the department.

Note: See Appendix A for an example of the department's plans approval application form (SBD-118), which includes prescription of the data pertinent to multifamily dwellings.

(e) *Plan approval.*

1. a. If the municipality having jurisdiction determines that the plans submitted substantially conform to this chapter and other legal requirements, an approval shall be issued in accord with this paragraph.

b. The plans shall be stamped "CONDITIONALLY APPROVED," signed, and dated by a certified commercial building inspector.

c. At least one set of the conditionally approved plans and all calculations and correspondence shall be retained in their original form or as microfilm or electronic-based copies for at least 4 years by the municipality. All other plans shall be returned to the submitter or the submitter's representative.

d. A notice of conditional approval shall be provided in writing to the submitter and the building owner stating all conditions of approval.

2. All conditions of the conditional approval shall be met before or during construction, and before occupancy of the building.

(f) *Denial of plan approval.*

1. If the municipality determines that the plans submitted do not substantially conform to this chapter or other legal requirements, a denial of plan approval shall be issued in accord with this paragraph.

2. The plans shall be stamped "NOT APPROVED," signed, and dated by a certified commercial building inspector.

3. At least one set of the not-approved plans shall be retained by the municipality. All other plans shall be returned to the submitter or the submitter's representative.

4. A notice of the not-approved plans shall be provided in writing to the submitter and the building owner stating the reasons for the denial.

(g) *Liability.* A conditional approval of a plan by a municipality may not be construed as an assumption of any responsibility on the part of the municipality, the certified commercial building inspector, or the department for the design or construction of the building.

(6) INSPECTIONS.

(a) Inspections shall be conducted by a certified municipality in accord with this subsection to determine whether the construction or installation conforms to the conditionally approved plans, the notice of conditional approval, the Wisconsin uniform multifamily building permit application, and this chapter.

(b) All inspections for the purpose of administration and enforcement of this chapter shall be performed by a certified commercial building inspector.

(c) At least one inspection report shall be written for the construction or installation shown on the approved plans. All reports shall include the name of the certified commercial building inspector.

(d) A copy of each inspection report shall be furnished to the building owner and plan submitter.

(e) A copy of each inspection report, or an electronic-based version of the data from the report, shall be permanently maintained in the files of the municipality.

(f) The inspection report shall indicate all items of noncompliance noted during the inspection.

(g) If noncomplying items are not corrected, orders to correct shall be issued in accordance with local ordinances.

(7) FEES. Municipalities and counties having jurisdiction for plan examination and building inspection may set by ordinance the fees for plan examination and building inspection services.

Note: See Appendix A for a list of the municipalities providing plan examination and building inspection under this section.

COMM 66.25 BUILDING MATERIAL APPROVALS.

(1) ALTERNATE MATERIALS. No provision in this chapter is intended to prohibit or prevent the use of any material, equipment, device, or method of construction not specifically mentioned in this code. Approval of an alternate material, equipment, device, or method of construction shall be obtained from the department.

(2) APPLICATION. Application for approval shall be made on a form prescribed by the department. The application shall include the fee specified in ch. COMM 2 and evidence

showing that the material, equipment, device, or method of construction meets the requirements of this chapter.

(3) TESTS.

(a) The department may require testing of any material, component, system, equipment, device, or method to determine the suitability for the intended use or to substantiate any claims made regarding equivalency to the requirements of this chapter. The department will accept results of tests conducted by a recognized, independent testing agency. The person requesting the approval shall bear the cost of any testing.

(b) The test method used to determine compliance with this chapter shall conform to a nationally recognized standard.

(c) If no nationally recognized standard exists, past performance or recognized engineering analysis may be used to determine suitability.

(4) TESTING LABORATORIES. A testing laboratory may submit to the department a request to be recognized as an approved testing laboratory that evaluates and certifies materials, products, or assemblies for conformance with the specifications or standards of this chapter. The request shall include all of the following:

(a) A completed building material approval application.

(b) Information, data, and other evidence describing the operations, policies, and procedures of the testing laboratory.

(c) The fee specified in ch. COMM 2.

(5) REQUIRED APPROVALS. An approval shall be obtained from the department for the following:

(a) Light-transmitting plastics.

(b) Direct vent sealed combustion chamber appliances.

(6) UNGRADED OR USED MATERIALS. Ungraded or used building materials may be used or reused as long as the materials possess the essential properties necessary to achieve the level of performance required by this chapter for the intended use. The department or the municipality enforcing this chapter may require tests in accordance with sub. (3). Approval for use of ungraded or used materials may be issued under this section or may be issued for a specific project under s. COMM 66.14.

(7) APPROVAL PROCESSING TIME. The department shall review and make a determination on an application under this section within 30 business days of receipt of all forms, fees, plans, and documents required to complete the review.

Note: A building material approval application form (SBD-8028) may be obtained from the Safety and Buildings Division, P.O. Box 7969, Madison, Wisconsin 53707.

COMM 66.255 MANUFACTURED MULTIFAMILY DWELLINGS.

(1) GENERAL. Pursuant to s. 101.75 (2), Stats., all manufactured multifamily dwellings approved by the department shall be deemed to comply with the requirements of all building ordinances and regulations of any local government except the security regulations permitted under s. 101.975 (1), Stats., and any regulations related to zoning and siting requirements, such as building setback requirements, side and rear yard requirements, and property line requirements.

Note: Department approvals for manufactured multifamily dwellings do not apply to on-site constructed elements, such as footings, foundations, attached porches or steps, concrete floor slabs, and on-site constructed mechanical systems.

(2) AFFIXING WISCONSIN INSIGNIA. A Wisconsin insignia shall be installed on a manufactured multifamily dwelling approved by the department and inspected at the manufacturing plant. Each Wisconsin insignia shall be assigned and affixed to a specific manufactured multifamily dwelling, in the manner approved by the department, before the dwelling is shipped from the manufacturing plant. The serial number shall be located on the manufacturer's data plate.

(3) MANUFACTURER'S RESPONSIBILITIES.

(a) *Insignia records.* The manufacturer shall keep permanent records regarding the handling of all Wisconsin insignias indicating the number of Wisconsin insignias which have been affixed to manufactured multifamily dwellings, building components, or groups of components; which Wisconsin insignias have been applied to which manufactured multifamily dwelling or building component; and the disposition of any damaged or rejected Wisconsin insignias. The records shall be maintained by the manufacturer or by the independent inspection agency for at least 10 years. A copy of the records shall be sent to the department upon request.

(b) *Lost or damaged insignia.*

1. If Wisconsin insignias become lost or damaged, the department shall be notified immediately in writing by the manufacturer or dealer.

2. If a Wisconsin insignia becomes damaged, the insignia shall be returned to the department with the fee specified in ch. COMM 2 to obtain a new insignia.

(4) INSIGNIA SUSPENSION AND REVOCATION.

(a) The department may suspend or revoke its approval if it determines that the standards for the construction or manufacture and installation of a manufactured multifamily dwelling do not meet this chapter, or if such standards are not being enforced as required by this chapter.

(b) Upon suspension or revocation of the approval, no further insignias may be attached to any manufactured multifamily dwelling or type of manufactured multifamily dwelling with respect to which the approval was suspended or revoked.

(c) Upon suspension or revocation of the approval, all insignias allocated to the manufacturer shall be returned to the department no later than 30 days from the effective date of the suspension or revocation.

(5) IN-PLANT INSPECTIONS. Manufacturers of multifamily dwellings shall contract with the department or an independent inspection agency to conduct in-plant inspections to assure that the manufactured multifamily dwellings are in compliance with the plans approved by the department. All inspections shall be performed by a certified commercial building inspector.

COMM 66.26 INDIVIDUAL VARIANCE FROM A SPECIFIC RULE.

(1) GENERAL. The department may grant an individual variance to a specific rule only if the granting of the variance does not result in lowering the level of health, safety, and welfare established or intended by the specific rule. The department may consider other reasonable criteria in determining whether a variance should be granted, including the effect of granting the variance on statewide and local uniformity.

Note: Section 101.02 (6), Stats., and ch. COMM 3 outline the procedure for submitting petitions to the department and the department procedures for hearing petitions.

COMM 66.26 Variances: *The intent of the variance procedure in COMM 66.26 is to basically be the same as that used now for the Commercial and Uniform Dwelling Code. One change is that now* ***both*** *the fire department and municipal recommendations* ***are required*** *for all petitions on life-safety issues. If the fire department does not have a responsibility for the rule being petitioned, they may indicate "no comment". For this reason, it is advisable that municipalities, which have not already done so, to develop a local procedure to coordinate these recommendations. The SBD-9890 two part variance form shall be used.*

Proper petition for variance preparation - submitters who wish to use the "petition for variance" process because of inability to comply with an COMM 66 provision should be advised that a petition is required ***for each major code issue or requirement..***

For example, a petition to apply COMM 57 in its entirety to a new building will not be accepted and processed. The submitter in this instance should identify which issues or requirements cannot be complied with (perhaps second floor dwelling unit entrances are more than 35 feet to a primary exit but other safety features make use of rescue platforms reasonable for second exits from the units). If specific code compliance to code-complying exiting cannot be achieved for a compelling reason, then that specific requirement should be petitioned with "equivalency" to the specific requirement, such as extra exits, increased fire resistance ratings, sprinklering or smoke detection, etc., offered with the petition application materials submitted.

(2) APPLICATION FOR VARIANCE. The applicant shall submit the application for variance on a form prescribed by the department to the municipality exercising jurisdiction. Where no municipality exercises jurisdiction, the application shall be submitted to the department. The following items shall be submitted when requesting a variance:

(a) A clear and concise written statement of the specific provisions of this chapter from which a variance is requested, together with a specific statement of the procedure and materials to be used if the variance is granted.

(b) The fee specified in ch. COMM 2.

(c) Any fee for processing the application that is required by a municipality which administers and enforces this chapter.

Note: See Appendix A for an example of the petition for variance application form (SBD-9890).

(3) MUNICIPAL RECOMMENDATION. The municipality administering and enforcing this chapter shall submit all applications for variance to the department within 10 business days after receipt. The municipality's submittal shall include the fire department's position statement in sub. (4), if applicable, and may include a municipal recommendation of whether the variance should be granted. Any recommendation from a municipality shall be on a form prescribed by the department and include all of the following:

(a) What inspections, if any, have taken place concerning the dwelling for which a variance is requested.

(b) Whether any correction orders have been issued concerning the dwelling.

(c) Whether the granting of the variance would substantially affect the health, safety, or welfare of any individual within the municipality.

Note: See Appendix A for an example of the municipal recommendation form (SBD-9890).

(4) FIRE DEPARTMENT POSITION STATEMENT. A fire department having responsibility in a rule for which a variance is being requested may only report its position on the variance on a form prescribed by the department.

Note: See Appendix A for an example of the fire department position statement form (SBD-9890).

(5) DEPARTMENTAL ACTION. Where a municipality administers and enforces this chapter, the department shall approve or deny applications for variance and mail a notice of the results to the municipality and the applicant within 30 business days after receipt of the application and recommendation. Where the department administers and enforces this chapter, the department shall approve or deny applications for variance and mail a notice of the result to the applicant within 30 business days for regular petitions for variance, or within 10 business days for priority petitions for variance as provided in ch. COMM 2.

COMM 66.27 MUNICIPAL VARIANCE FROM THIS CHAPTER.

(1) GENERAL. Any municipality exercising or intending to exercise jurisdiction under this chapter may apply to the department for a variance permitting the municipality to adopt an ordinance not in conformance with this chapter. The department shall review and make a determination on a municipal request under this section within 60 business days of receipt of the request.

COMM 66.27 allows a municipality to petition for a variance from the uniformity of COMM 66 under the circumstances of special climate or soil conditions.

(2) APPLICATION FOR VARIANCE. The department may grant a municipal variance only where all of the following are demonstrated:

(a) The municipality demonstrates that the variance is necessary to protect the health, safety, and welfare of individuals with n the municipality because of specific climate or soil conditions generally existing within the municipality.

(b) The municipality demonstrates that the granting of the variance, when viewed both individually and in conjunction with other variances requested by the municipality, does not impair the statewide uniformity of this chapter.

(3) DEPARTMENTAL INQUIRY. Prior to making a determination, the department shall solicit within the municipality and consider the statements of any interested persons as to whether the variance should be granted.

(4) UNIFORMITY. This section shall be strictly construed in accordance with the goal of promoting statewide uniformity.

COMM 66.28 APPEALS OF ORDERS AND DETERMINATIONS AND FOR EXTENSION OF TIME.

(1) APPEALS OF ORDERS AND DETERMINATIONS BY A MUNICIPALITY EXERCISING JURISDICTION.

(a) *General.* Appeal of an order or determination of a municipality exercising jurisdiction under this chapter, including denial of an application for a permit, shall be made in accordance with the procedure in ch. 68, Stats., except as provided in this subsection.

COMM 66.28 Appeals of Municipal Decisions: *incorporates the same procedures utilized now to informally and formally resolve disagreements in code application. The municipal code enforcers*

should contact the Division of Safety & Buildings directly to resolve any unclear issues rather than ask the submitter to get state approval of a concept.

(b) *Appeal of a final determination by a municipality exercising jurisdiction.* Appeal of a final determination by a municipality may be made to the department in lieu of the judicial review specified in ch. 68, Stats. Any appeal to the department shall be in writing stating the reason for the appeal. All appeals shall be filed with the department within 10 business days of the date the final determination is rendered under ch. 68, Stats. The department shall render a written decision on all appeals within 60 business days of receipt of all calculations and documents necessary to complete the review.

(c) *Informal appeal of any determination by a municipality exercising jurisdiction.* Informal appeal of any determination by a municipality may be made to the department prior to exhausting the procedures in ch. 68, Stats. The department may require the appeal to be in writing and may require the municipality's response to the appeal, prior to issuing a determination. The department's determination may be in writing but may not prevent the appellant from exhausting the procedures in ch. 68, Stats., and par. (b).

(d) *Appeal of a determination by a municipality electing to not be governed by ch. 68, Stats.* Any appeal of an order or determination of a municipality exercising jurisdiction under this chapter and electing to not be governed by ch. 68, Stats., shall be in writing to the department and shall state the reason for the appeal. The department shall render a written decision on any appeal within 60 business days of receipt of all calculations and documents necessary to complete the review.

(2) APPEALS OF ORDERS AND DETERMINATIONS BY THE DEPARTMENT. Appeal of an order or determination of the department made pursuant to this chapter, including denial of an application for approval, shall be in accordance with the procedure in s. 101.02 (6) (e) to (i), and (8), Stats. The department shall review and make a determination on an appeal of an order or determination within 60 business days of receipt of all calculations and documents necessary to complete the review.

(3) EXTENSIONS OF TIME.

(a) When an order issued under s. COMM 66.23 is appealed, the time specified in s. COMM 66.23 (3) for correction of the order is automatically extended to the termination of the appeal procedure.

(b) The department or municipality administering and enforcing this chapter may grant additional time to comply with a violation order.

COMM 66.29 VIOLATIONS AND PENALTIES.

(1) VIOLATIONS. No person may construct or alter any dwelling in violation of any provision of this chapter.

COMM 66.29 Violations and Penalties: *Again, the intent is to follow the current practices. The department was not given authority to limit the municipality citation powers established in other statutes.*

(2) INJUNCTION. When a violation occurs, the department may bring legal action to enjoin the violation.

(3) ORDINANCES. This chapter does not affect the enforcement of any ordinance or regulation, the violation of which occurred prior to the effective date of this chapter.

(4) PENALTIES. Penalties for violations shall be assessed in accordance with s. 101.978, Stats.

Note: Section 101.978, Stats., reads, "Any person who violates this subchapter or any rules promulgated under this subchapter shall forfeit not less than $25 nor more than $500 for each offense. Each day of continued violation constitutes a separate offense."

(5) MUNICIPAL ENFORCEMENT. Any municipality which administers and enforces this chapter may, by ordinance, provide remedies and penalties that do not conflict with subs. (1) to (4).

Subchapter II — Occupancy Requirements

COMM 66.32 CONSTRUCTION.

(1) GENERAL. For the purpose of determining the maximum height and area of buildings within the scope of this chapter, the building construction is classified in accordance with the construction standards specified in s. COMM 51.03. Floor systems for mezzanines, lofts, and open balconies located within an individual dwelling unit may be nonrated.

COMM 66.32 (1) - General: *Although a mezzanine, etc. contained within a living unit may be unrated, if T. 51.03-A requires it to be noncombustible, then it must comply.*

Storage: *The question is often asked how "storage" areas within individual dwelling units are handled (either in the residential part of the dwelling unit or in a private garage serving only that unit). [See COMM 66.33 (1)(h) for sprinkler design requirements specific to storage in common areas and COMM 66.47 regarding "combustible hazards" in common areas.]*

For example, an "attic" space above the finished envelope might be desired as informal storage space (similar to how homeowners in one- and two-family dwellings store small items in the attic space). What types of code requirements must be addressed for this to be done in a multifamily dwelling?

Briefly, within such an attic space the following types of issues would need to be addressed:

- Separation from adjacent attic space (i.e., at least one layer of 5/8-inch fire code rock on each side of a separation between the two attic spaces unless 2-hour separations are required to meet area limits).

- Headroom - as per COMM 66.465 (4), there is no minimum headroom required in storage areas.

- Live load - attic storage within living units shall be designed for a minimum 20 psf live load as per Table COMM 53-I (1)(g) 3.

- Permanent stairs (other than standard attic scuttle fold-down stairs) shall comply with COMM 66.39 stair requirements including complying rise and run, adequate stair width, and handrails (adequate headroom, as above, is not strictly required but is advisable).

- Light and ventilation - an area used strictly for storage is considered nonhabitable and, as such, would not require light and ventilation.

- Determination of number of stories - providing a permanent stair to a finished space or floor area will create a new "floor level" (which, if not consistent with the definition of a "loft," may add another story to the building).

Also, if it is intended at any time in the future that the "storage" area be later finished for habitable space, all requirements relative to the "habitable" use will apply at the time of conversion

(including light and ventilation, headroom, insulation and/or heating equipment, egress windows from a sleeping room, etc.).

(2) DWELLING UNIT SEPARATION.

(a) 1. Except where 2-hour fire resistance is provided in accord with s. COMM 66.33 (1), each dwelling unit shall be separated from other units, common use areas, and the exit access corridors by construction protected with fire-protective membranes consisting of at least the equivalent of one layer of 5/8-inch type X gypsum wallboard with taped joints, on each side of the wall and on the ceiling. Where the building is equipped with an automatic fire sprinkler system in accordance with s. COMM 66.33 (1), and except as provided in s. COMM 66.33 (2)(a), the protection may be reduced to a single layer of 1/2-inch type X gypsum wallboard with taped joints, on each side of the wall, and on the ceiling.

2. The fire-protective membrane required in subd. 1. shall be fastened to the framing or suspended in the manner required for 1-hour fire-resistive rated assemblies, except the fastening to the ceiling may be made without the clips associated with that manner if the spacing of the fasteners does not exceed the spacing of the framing elements.

3. The fire-protective membrane required in subd. 1. may be omitted on the ceiling of the topmost story if the dwelling unit separation wall extends to the roof deck.

(b) 1. Mineral fiber or glass fiber type insulation may be used to fill the cavity spaces of the separation specified in par. (a).

2. Soundboard products may be used in conjunction with the systems specified in par. (a).

COMM 66.32 (2)(a) 1. Dwelling Unit Separation: *Caution: Do not confuse the allowed reduction of the living unit separation to 1/2-inch Type X gypsum wallboard in a sprinklered building with the class of construction requirements. Based on the Type 7 structural fire ratings and COMM 66.33 (2)(a) (referenced by this section), the load-bearing walls and ceilings of Type 8 buildings exceeding threshold limits usually require 5/8-inch Type X gypsum. The only instances where the reduction to 1/2-inch gypsum may occur on bearing walls or floor/ceilings are typically in Type 8 buildings below the threshold limit and voluntarily sprinklered, or as included as a listed element of a recognized specific fire resistive assembly. When the reduction is utilized, it is very important that bearing and nonbearing walls are clearly identified on the plans. Caution: If any reduction is taken due to sprinklering, it is possible that attempting to use the sprinkler system as additional equivalency for a variance may not be accepted.*

COMM 66.32(2)(a)2. QUESTION*: When the code states that ceiling wallboard shall be fastened or suspended in the same manner as required for 1-hour fire-resistive rated assemblies, except the fastening to the ceiling may be made without the clips associated with that manner, what does this mean?*

ANSWER*: The easiest way for a designer to approach this is to use the UL or Gypsum Fire Resistance manual to find 1-hour fire-resistive systems utilizing the same* ***type of structural member*** *(dimensional lumber, TJI, engineered truss, etc.)* ***at the same spacing*** *(16" on center, 24" on center, etc.). If the listed assembly would require resilient channels or clips for proper fastening of the wallboard to the framing member at the required member spacing, then the designer should specify the same method of attachment, fastening schedule, etc., for the dwelling unit separation.*

COMM 66.32(2) – QUESTION: How should dwelling unit separations be handled at exterior wood decks serving individual dwelling units?
ANSWER: *If the deck is outside the main building (i.e., exterior to the thermal envelope or shell of the building), no dwelling unit separation is required between continuous decks from separate dwelling units. A simple "privacy screen" on an attached exterior deck would be allowable as the dwelling unit separation.*

(3) BASEMENT AND GROUND FLOORS.

(a) A ceiling located below the first story of a multifamily dwelling shall be protected with a fire-protective membrane consisting of at least the equivalent of one layer of 5/8-inch type X gypsum wallboard with taped joints. Fastening of the membrane shall be in accord with sub. (2)(a) 2.

(b) The provisions of par. (a) do not apply where the space below the first story is a dwelling unit or portion thereof, where the space below the first story is a nondwelling unit portion that is protected by an approved automatic sprinkler system, and in crawlspaces.

(c) All foundations shall meet the requirements for the soil bearing values contained in s. COMM 53.21 and the structural design standards listed in s. COMM 53.61. All pressure-treated wood and plywood shall be treated and identified in accordance with the adopted standards of the American Wood Preservers Bureau.

COMM 66.32(3)(c) QUESTION: Are wood foundations allowed in this code?
ANSWER: *Effective with the July 1, 1996, code change package, wood foundations are allowable if designed and constructed in accordance with COMM 53 requirements.*

Note: The National Forest Products standard for "All-Weather Wood Foundation System, Basic Requirements" Technical Report No. 7 is an accepted standard for wood foundation design.

(4) ATTACHED GARAGES.

(a) An attached garage that is larger than 600 square feet in area shall either be separated from the rest of the multifamily dwelling by 3-hour fire-resistive rated construction, or be protected by an automatic fire sprinkler system and be separated by 2-hour fire-resistive rated construction. As used throughout this chapter, an attached garage includes, but is not limited to, a basement garage.

Note that a garage attached to or within 10 feet of a Multifamily occupancy is considered part of the Multifamily occupancy (and cannot be considered a separate Chapter 59 garage occupancy unless vertically separated by an ***unpierced vertical 4 hour fire division wall).***

Therefore, a basement multifamily common garage must have egress (COMM 66.34), smoke or fire detection (COMM 66.49), fire alarm pull stations and horns (COMM 66.50) the same as other multifamily common areas. Also, storage on the garage level requires isolation of hazards from the garage area in accordance with COMM 66.47.

(b) 1. a. An attached garage which is 600 square feet or less in area, or which is divided into areas of 600 square feet or less by construction having at least one-hour fire-resistive rating, shall be separated from the rest of the multifamily dwelling by the construction specified in sub. (2). Any opening in a wall separating the garage from the rest of the multifamily dwelling shall be protected by means of a self-closing door assembly providing a minimum fire-resistive rating of 3/4 hours, except as provided in subpar. b.

Note that if the 1 hour fire resistive walls between the 600 sf or less garage areas do not extend all the way from the slab to the underside of the roof deck (i.e., through the garage attic space), then a one hour fire resistive assembly or "finish" is required at the garage ceiling. A one hour "finish" may be accomplished by using the 60 minute or better membrane "finish" as from an assembly such as L505 or L511 (UL Fire Resistance Manual).

b. For an attached garage that serves a single dwelling unit, the door shall have a minimum fire rating of 20 minutes. A 1 3/4-inch solid core wood or insulated metal door may be installed with a pair of 1 1/2-inch steel hinges in a 1 7/32-inch minimum thick solid wood frame with a 1/2-inch thick door stop. The self-closing device may be omitted.

2. Facilities for repairing or fueling vehicles are prohibited within an attached garage.

(c) Small, gasoline-fired equipment and associated, incidental containers of gasoline that are used in maintaining the dwelling premises may be stored in an attached garage, without providing additional fire-resistive separation.

Note: Automatic operators of residential vehicular garage doors are required by the federal consumer product safety commission to include an external entrapment protection device that conforms to various specifications. Operators that comply with this requirement generally are labeled with the Underwriters Laboratory logo or listing mark and a date of manufacture subsequent to January 1, 1993.

COMM 66.32(4)(b) and 66.33 (1)(a) QUESTION: *If my attached garages are compartmentalized into 1-hour sections as allowed by the code, when must a 45-minute door assembly be used and when may a 20-minute fire door be used?*

ANSWER: *An individual garage serving an individual dwelling unit may have a 20-minute fire door between the dwelling unit and the garage. In instances where a larger bank of common area garages are compartmentalized into areas of 600 square feet or less by 1-hour construction, but the garages have doors into a common area, the doors from the garages to the common areas must be minimum 45-minute door assemblies.*

Note: If seeking to exclude from area limits the individual garages as allowed by COMM 66.33 (1)(a), the doors shall be minimum 45-minute fire door assemblies. ***Attached garages - if serving tenants only*** *and attached to the COMM 66 occupancy by other than an unpierced 4-hour fire-division wall, the garage is considered part of the COMM 66 occupancy and is* ***not*** *considered an COMM 59 occupancy. This is true when the attached garage is in a common area (thus counting toward any nondwelling unit area limits, as per Table 66.33-A) as well as when the attached garage directly serves an individual dwelling unit (and the garage area is counted as part of the dwelling unit in Table 66.33-A).*

There are a number of implications to this that designers must be aware of in the design of the COMM 66 "garage" use area. For example, an attached residential common garage which is separated by 2- or 3-hour construction as required by COMM 66.32 (4)(a) must then meet exit distance as per COMM 66.34(4), have smoke detection as per COMM 66.49 (at least one in the basement and at the door on each floor level leading to the enclosed stair), have fire alarm sounding devices and pull stations as appropriate per COMM 66.50.

If a designer chooses to separate the attached garage by a complete ***unpierced*** *vertical 4-hour fire-division wall as per COMM 66.33 (2) (c), then the garage area is covered under COMM 59 and may be treated as a separate occupancy from the COMM 66 section.*

Special case for garages that serve more than just Chapter 66 occupants*: If the garage serves other than residential tenants, such as employees working in ,or the public frequenting*

nonresidential occupancies in the same building, ***then the garage is subject to not only COMM 59 requirements, but also to ADAAG requirements.*** *This includes a 96-inch vertical vehicle clearance.*

COMM 66.32 (4)(a) Attached Garages, Sprinkler Systems*: Garages are determined to be part of the dwelling units for area computation unless separated by 1-hour construction; they must also be considered as part of the NFPA 13R system for fire protection purposes. Garages are not listed in the exception section of NFPA 13R..*

For example, a 22-unit apartment building has a large common activity room and an attached underground parking garage. Inside the dwelling unit, the design area for a NFPA 13R system is based on the flow for up to four residential sprinklers in the hydraulically most demanding compartment. Outside the dwelling units (the activity room), the design discharge, number of sprinklers, water demand of the system, sprinkler coverage and position of the sprinklers must comply with the provisions of NFPA 13 for the appropriate hazard classification. The above-mentioned design considerations of NFPA 13 would apply to the garage.

Remember: The hazard classification and fire incidence statistics are the foremost design considerations for sprinkler systems.

COMM 66.32 (4)(c) Gasoline Storage*: Incidental gasoline storage must still satisfy COMM 14 requirements.*

COMM 66.32(4)(a) Elevator Shafts/Basement Garage Separation Considerations *– Frequently, basement garage levels in sprinklered multifamily buildings have an elevator that is used for interior circulation from the basement to occupied residential levels. In instances where the building code allows a 1 or 2 hour shaft (and that shaft rating is maintained to a properly constructed 1 or 2 hour fire-resistive "cap" in conjunction with 45 minute or 90 minute elevator doors), it* ***may*** *be possible to allow the elevator to open into the garage if the shaft wall, the garage floor-ceiling and elevator doors can maintain the needed 2 hour separation of the garage from the rest of the building. (Note that the code prohibits opening the elevator shaft directly into a required stair enclosure).*

(5) PENETRATIONS.

(a) *Fire-resistive assemblies.* Openings that occur around ducts, pipes, and conduits or other penetrating items that penetrate required fire-resistive assemblies shall be protected in accordance with s. Comm 51.049.

(b) *Fire-protective membranes.* The annular space around ducts, pipes, and conduits or other penetrating items that penetrate fire-protective membranes required under or referenced in subs. (2)(a), (3)(a), and (4)(b) 1.a., s. COMM 66.33 (2)(a) and (b) 1., and s. COMM 66.42 (2) shall be protected in the same manner as required for 1-hour fire-resistive rated assembles in s. Comm 51.049.

Note: The reference to 1-hour fire-resistive rating does not require that the fire-protective membranes as described in s. COMM 66.32 (2) provide a 1-hour rating as listed assembly.

Please see Commentary under COMM 51.049 for additional discussion of protection of openings. Note that the dwelling unit separation required per COMM 66.32(2) does not necessarily include the floor sheathing – as in the case of interruption of the floor sheathing for tub drains or similar mechanical penetrations.

(c) *Ceiling ducts.*

1. Except as provided in subd. 2., a duct larger than 20 square inches that penetrates a ceiling fire-protective membrane required under or referenced in subs. (2)(a), (3)(a), and (4)(b) 1.a., s. COMM 66.33 (2)(a) and (b) 1., and s. COMM 66.42 (2) shall be protected in the same manner as required for 1-hour rated assemblies in accordance with one of the following:

   a. A fire damper as specified in s. COMM 64.42.

   b. A listed duct outlet protection system.

   c. A least six feet of continuous steel ductwork from the membrane penetration toward the air-handling unit.

2. A duct is not required to be protected in accordance with subd. 1 provided the floor-ceiling assembly has been tested and listed without protecting the duct penetration and maintains the fire-resistance rating of the assembly.

Note: The reference to 1-hour fire-resistive rating does not require that the fire-protective membranes as described in s. COMM 66.32 (2) provide a 1-hour rating as a listed assembly.

*The Department will accept **metal** bath fan housings in living unit ceiling membrane if vented with at least 6 feet of **steel** ductwork per (c)1.c.*

COMM 66.33 ALLOWABLE AREA AND HEIGHT.

(1) FLOOR AREAS.

(a) An automatic fire sprinkler system or 2-hour fire resistance shall be provided in every multifamily dwelling that contains floor areas or dwelling units exceeding any of the thresholds established in Table 66.33-A. The floor areas specified in the threshholds do not include any of the following:

1. Areas that are outside the building, as in the following:

   a. Porches that are open to the outside atmosphere.

   b. Exterior stairs.

   c. Exterior platforms.

   d. Exterior landings.

   e. Exterior decks.

2. An attached garage that meets all of the following criteria:

   a. Has a floor area of 600 sf or less.

   b. Serves a single dwelling unit.

   c. Is accessed directly from the dwelling unit.

   d. Is separated from the remainder of the building by at least 1-hour rated fire-resistive construction.

Note: Housing units that receive federal funding may be required by federal regulations to have sprinkler protection regardless of building size.

***Table 66.33-A QUESTION:** When my building exceeds any one of the thresholds of Table 66.33-A, what are my options if it is impractical to provide a sprinkler system in the building?*

ANSWER: If the building exceeds the thresholds of Table 66.33-A, then options to provide a sprinkler system would include:
***Compartmentalizing** each dwelling unit with 2-hour fire-resistive construction (see COMM 66.03 and 66.37 for more information). This is different from the "2-hour vertical division walls" previously allowed by COMM 57.*

***Separating** the building into smaller "buildings" by unpierced 4-hour fire division walls.*

***Connecting** the building into smaller "buildings" by pedestrian walkways that comply with COMM 62 - Subchapter VII.*

***Excluding** individual garages (each separated from the dwelling unit it serves by one hour construction with 45 minute fire doors) or excluding exterior porches, platforms, landings, decks (see COMM 66.33(2)(a)).*

Note: Pre-existing sprinkler ordinances are enforced locally with lower thresholds. Your options are the same as above or you may possibly obtain a variance from the municipality for their additional requirements beyond Table 66.33-A. See the code appendix for a list of municipalities known to be enforcing pre-existing sprinkler ordinances.

***COMM 66.33 QUESTION**: I wanted to submit a petition for variance on COMM 66.33 threshold limits and was told that such a petition could not be accepted or processed because the Wisconsin State Statutes specifically define these thresholds. Why is this not petitionable?*

***ANSWER:** Because the state statutes are specific as to what the "threshold" limits are in Table COMM 66.33-A, a state agency may not administratively by code or petition for variance waive them. Normally state law gives a state agency authority to create administrative rules and modify them as necessary. However, when the state statutes are specific as to the requirements, such as the thresholds of COMM 66.33-A, an administrative code or petition for variance may not contradict what is stated in the state statutes. The only way the requirements can be changed is for the statutes to change.*

(b) An unpierced 4-hour-rated building division wall constructed as specified in s. COMM 51.02(13) may be used to separate a building into smaller buildings which individually do not exceed the thresholds in Table 66.33-A and which therefore are not required to have an automatic fire sprinkler protection or 2-hour fire resistance.

Note: The separation specified in this paragraph does not enable circumvention of requirements relating to barrier-free accessibility or fair housing.

(c) Two-hour fire resistance for sloping roofs may be provided with one of the following:

1. A 2-hour rated ceiling.

2. a. Extension of all two hour vertical separations to the underside of the roof deck, except as provided in subd. 2.b.

Note: Section COMM 51.042(8) requires a 2-hour fire-resistive rating for structural elements that support 2-hour fire-resistive construction.

b. Where an exterior wall of a dwelling unit extends above the roof of an adjoining unit, the portion of the wall extending above that roof is not required to have a 2-hour rating if the underlying roof-ceiling assembly has a rating of at least 1-hour of the ceiling membrane provides a finish rating of at least 60 minutes.

Note: A floor-ceiling assembly separating one level of a dwelling unit from another level of the same unit is not required to have a 2-hour fire-resistive rating, except as specified in COMM Table 51.03-A. However, under

COMM 66.32(1), the ratings in that table do not apply to floor systems, lofts, and open balconies within a dwelling unit.

COMM 66.33 (1)(e) COMM 66.03 (12) Two-Hour Fire Resistance: *COMM 66.03 (12)/66.33 (2) When applying the "2-hour fire resistance" option to exceed the allowable areas of Table 66.33-A, designers are cautioned that the requirement is very different from the "2-hour division walls" previously allowed in COMM 57.02 (2)(b).*

COMM 66.03 indicates "Two-hour fire resistance" in this code has the following meaning given in s. 101.14 (4m)(a) 5m., Stats:

NOTE: Section 101.14 (4m)(a) 5m., Stats., reads: "Two-hour fire resistance" means 2-hour fire separations for all walls that separate dwelling units, exit corridors and exit stair enclosures and for all floors and ceilings so that the specified walls, floors and ceilings are capable of resisting fire for a period not shorter than 2 hours."

To meet this definition of 2-hour fire resistance, essentially each living unit must be encapsulated in 2-hour construction.

Designers should also be aware that as this is defined and set as such in the state statutes, the division is unable to process any administrative code changes, including consideration of petitions for variance, on this item.

To comply with this method of exceeding the Table A threshold limits, all walls or floor/ceilings that ***separate*** *dwelling units, exit corridors, and exit enclosures and any supporting structure for these walls and floor/ceiling, must be 2-hour rated. In addition, the topmost ceiling must be 2-hour rated to limit fire spread across the roof to other living units. If the roof is sloping, the two options are acceptable per the following diagrams. Note that it may not be easy to attain a 2-hour or 1-hour sloped truss assembly with insulation. For the option on the right, a 1-hour finish rating may be used if insulation is raised off the ceiling finish.*

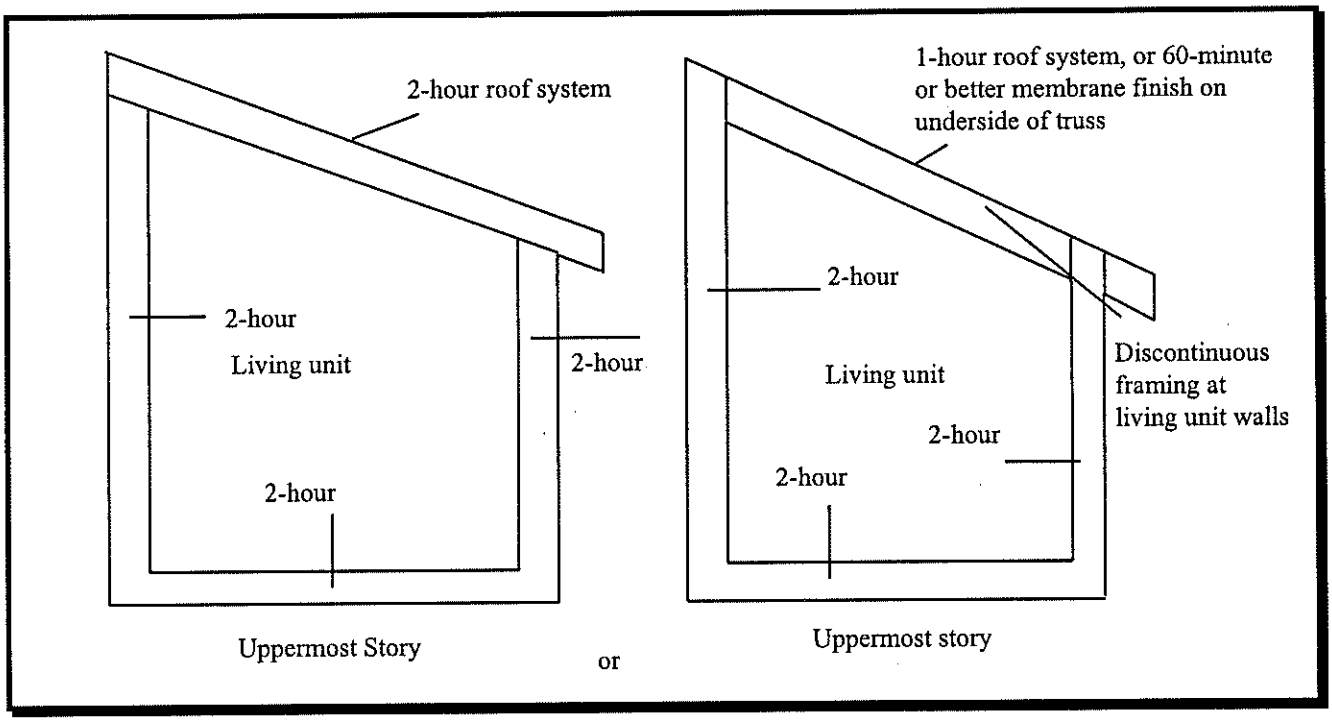


TABLE 66.33-A

THRESHOLDS ABOVE WHICH SPRINKLERS OR 2-HOUR SEPARATIONS ARE REQUIRED

Class of Construction	Total Floor Area Within Individual Dwelling Units	Number of Units	Total Floor Area of Nondwelling Unit Portions (Common use areas, such as corridors, stairways, basements, cellars, vestibules, community rooms, laundry rooms, pools, etc.)
Type 1 Fire Resistive Type A	16,000 sq ft	20 units	16,000 sq ft
Type 2 Fire Resistive Type B			12,000 sq ft
Type 3 Metal Frame Protected			8,000 sq ft
Type 4 Heavy Timber Type 5A Masonry Protected Type 5B Masonry Unprotected Type 6 Metal Frame Unprotected Type 7 Wood Frame Protected			5,600 sq ft
Type 8 Wood Frame Unprotected			4,800 sq ft

(d) Automatic fire sprinkler systems in buildings of 4 stories or less shall comply with NFPA 13R or 13, as adopted by reference in s. COMM 51.25, except the sprinklers within the dwelling units shall be residential type conforming to NFPA 13R and installed in accord with the recommendations and requirements of the manufacturer.

(e) Automatic fire sprinkler systems in buildings of 5 to 6 stories shall comply with NFPA 13 as adopted by reference in s. COMM 51.25, except the sprinklers within the dwelling units shall be residential type conforming to NFPA 13R and installed in accord with the recommendations and requirements of the manufacturer. However, any dwelling unit areas for which sprinkler manufacturers do not have residential type recommendations shall be protected in accord with NFPA 13.

(f) In the automatic fire sprinkler systems specified in pars. (d) and (g), sprinklers may be omitted in the following locations:

1. Unheated exterior storage rooms that do not exceed 12 square feet in area.

2. Unheated exterior mechanical equipment rooms that do not exceed 16 square feet in area.

3. Storage areas not exceeding 1500 square feet in area that are in nondwelling unit portions and separated from the remainder of the building by at least 2-hour fire-resistive construction, provided the areas are equipped with an approved smoke detection system which complies with all of the following:

a. The smoke detection system is directly and permanently wired to a proper unswitched circuit.

b. The smoke detection system is interconnected with the building manual fire alarm system. If the building does not have a manual fire alarm system, the smoke detection system shall be capable of sounding an audible alarm that can be heard in all occupied areas of the building.

(g) Except as specified in par. (f) 3., a building that will contain a sprinklered portion and a 2-hour fire-resistive unsprinklered portion shall have those portions separated by a 4-hour unpierced fire wall.

(2) ALLOWABLE AREA AND HEIGHT.

(a) *Buildings exceeding the thresholds in sub. (1).* Buildings protected by an automatic fire sprinkler system or 2-hour fire resistance in accordance with sub. (1) are not limited in area or height, up to the 60-foot maximum in s. COMM 66.03 (6), except that buildings of Type 7 or 8 construction may have no more than 4 occupied floor levels of wood frame construction; any additional floor levels shall be of Type 5 or better construction, and the total number of stories may not exceed 4. For Type 8 buildings, the structural building elements as listed in Table 51.03-A, and the dwelling unit separations listed in s. 66.32 (2), but not those elements specified in sub. (1)(a) 1., shall be protected with at least the 5/8-inch type X wallboard or equivalent as specified in s. 66.32 (2).

Note: There are other requirements that impact or affect the fire-resistive ratings or properties of exterior walls and elements, such as the setback limitations for property lines under s. Comm 51.03.

COMM 66.33(2) Structural Considerations in Larger Type 7 and 8 Structures *– Designers are advised to consider "crushing" (i.e., compression perpendicular to grain and parallel to grain) in the taller wood frame structures allowed under COMM 66.33. It may be necessary to reinforce the wood framing with steel or change framing to avoid "crushing" at those locations where the loads are higher than the 1991 NDS Wood Design Manual would allow.* ***Special Note To Inspectors And Contractors****: Changing to a lesser grade of wood than that specified by the designer in these larger structures could result in unforseen "crushing" problems on the lower floor levels of the building.*

COMM 66.33 (2)(a) Allowable Area:

CODE APPLICATION APRIL 1 - AUGUST 9, 1995: Note that a Type 8 building with 5/8-inch fire code rock on structural parts and walls, ceilings, etc., may be built to Type 7 limits if it does not exceed any of the thresholds of applicable Table 66.33-A or B.

AFTER AUGUST 9, 1995, EMERGENCY RULE ISSUANCE: Table COMM 66.33-C was revised to remove specific square footage limitations and to address maximum number of stories in unsprinklered/non-2-hour protected buildings only. Thus, if a building is under the thresholds of Table 66.33-A, the aggregate dwelling unit area, common area, etc., may be distributed any way the submitter wishes within the maximum number of stories.

CODE CHANGE PACKAGE EFFECTIVE JULY 1, 1996: Exterior decks, porches, and individual garages may be excluded from area limit thresholds if meeting the criteria in COMM 66.33 (1)(a) 1. and 2.

EXAMPLE: A Type 8 building has 10,000 square feet on the first floor level (6,000 square feet residential units, 4,000 square feet garages serving individual dwelling units) and 6,000 square feet on the second floor (all residential units). As the garages directly service individual units and open directly to the living units, this building will be just "at" the 16,000 square feet maximum aggregate dwelling unit area of Table 66.33-A. If the 16,000 square feet is exceeded OR there are more than 20 units OR there is a common area exceeding 4,000 square feet, then the building will exceed "thresholds." The submitter must then either sprinkler the building, compartmentalize each living unit with 2-hour construction, use unpiereced 4-hour fire-division walls to divide the larger building into smaller buildings within the applicable thresholds, or separate the individual garage by the fire separations (see COMM 66.33 (1)(a)). A fifth design option would be to redesign the building to be under all thresholds.

COMM 66.33 (2)(a) Allowable Levels of Wood Frame: *Type 7 or 8 buildings exceeding the threshold limits may have no more than four occupied floor levels of* ***wood frame*** *construction. Attached garages, such as a typical underground common garage level, are considered occupied floor levels.*

(b) *Buildings at or below the thresholds in sub. (1).*

1. Buildings without the sprinkler protection or 2-hour fire resistance required by sub. (1) shall comply with Table 66.33-B, except that Type 8 buildings may be built to the Type 7 limits in that table if the structural building elements listed in Table 51.03-A for Type 8, but not those elements specified in sub. (1)(a), are protected with at least the 5/8-inch type X wallboard or equivalent as specified in s. COMM 66.32 (2).

Note: There are other requirements that impact or affect the fire-resistive ratings or properties of exterior walls and elements, such as the setback limitations for property lines under s. Comm 51.03.

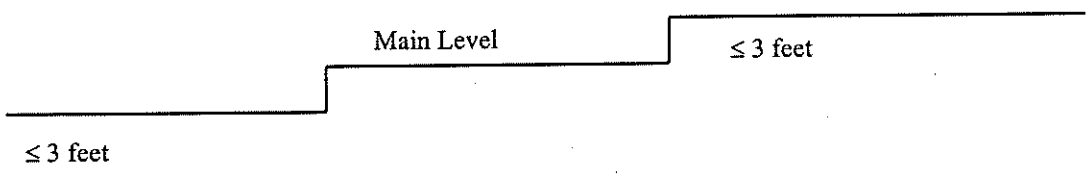
Exterior deck supports in "Type 7" classified buildings - "heavy timber" elements such as 6 x 8 columns will be accepted in lieu of 1-hour fire-resistive column assemblies.

2. a. Except as provided in subpars. b. and c., a building without the sprinkler protection or 2-hour fire resistance required by sub. (1) shall be separated from any other building or property line by either a 10-foot setback or a 4-hour-rated wall.

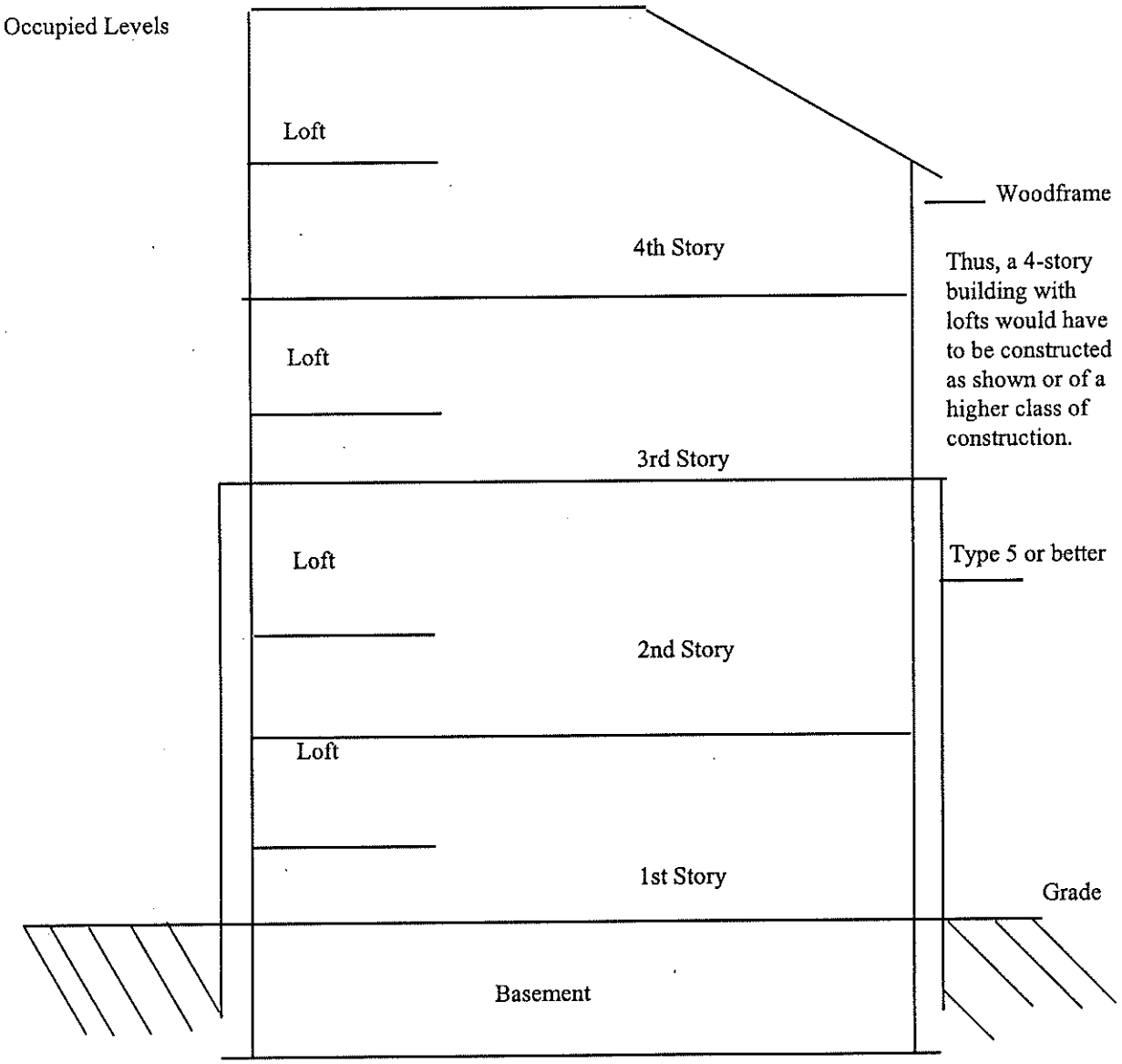
b. The property lines specified in subpar. a. do not include property lines along streets.

c. The separation in subpar. a. does not apply where the combined areas or dwelling units of buildings closer than 10 feet are at or below the threshholds in sub. (1).

As per COMM 51.01, a floor level may have a raised or depressed area within 3 feet of the proposed floor, thus, the following may be considered one floor level:



It is important to note that lofts are considered floor levels.



COMM 66.33 (2)(b) 2. Building Location: *Since buildings, which are sprinklered or constructed satisfying the 2-hour fire-resistance requirements, are unlimited in area, they may be closer than 10 feet to each other. The COMM 51.03 Table A and B requirements would still apply to buildings in proximity to property lines. It should be noted that COMM 66.33 (2)(b) 2. imposes a 4-hour rated wall or 10-foot separation from property lines including Type 6 or better construction, which is a more restrictive requirement than COMM Table 51.03-A. Also, note that court widths for exiting and light and ventilation must still be maintained. Caution: If detached buildings are considered as one building due to proximity, then requirements for code-complying fire alarm and smoke detection systems, sprinkler systems, emergency power systems, etc., must be satisfied as if the buildings were one building in the absence of an unpierced 4-hour fire-division walls separating the sections.*

TABLE 66.33-B
HEIGHT LIMITATIONS FOR BUILDINGS WITHOUT AUTOMATIC FIRE SPRINKLER SYSTEM PROTECTION OR TWO-HOUR FIRE RESISTANCE

Class of Construction	Number of Stories
Type 1 - Fire-Resistive Type A Type 2 - Fire-Resistive Type B	6
Type 3 - Metal Frame Protected	4
Type 4 - Heavy Timber Type 5A - Exterior Masonry Protected	4
Type 5B - Exterior Masonry Unprotected, Type 6 - Metal Frame Unprotected, and Type 7 - Wood Frame Protected	3
Type 8 - Wood Frame Unprotected	2

(c) *Mixed use buildings.*

1. In a building containing a multifamily dwelling and one or more occupancies that are regulated by chs. COMM 54 to 62, the chs. COMM 54 to 62 occupancy shall comply with subds. 2 and 3 and be separated from the multifamily dwelling in accord with s. COMM 51.08 except as follows:

a. In applying Table 51.08, the multifamily dwelling shall be treated as a ch. COMM 57 occupancy.

b. Any of the fire-resistive ratings in Table 51.08 that are less than 4 hours shall be increased by 1 hour.

2. The chs. COMM 54 to 62 occupancy may not be on a floor or story that exceeds the height limitation specified in s. COMM 51.02 (21).

3. The chs. COMM 54 to 62 occupancy shall comply with the applicable requirements in chs. COMM 50 to 64, including class of construction separation, maximum floor area, and minimum automatic fire sprinkler system protection.

4. An unpierced, 4-hour-rated building division wall constructed as specified in s. COMM 51.02 (13) may be used to separate the multifamily use. Buildings in which the multifamily use is separated from chs. COMM 54 to 62 occupancies in this manner may be designed to meet only the ch. COMM 66 requirements on the multifamily side and to meet only the chs. COMM 50 to 64 requirements on the other side.

COMM 66.33 (2)(c) Mixed Use Buildings: *As stated in COMM 66.32 (4) commentary, an attached residential garage* ***serving only residential tenants*** *is not considered an COMM 59 occupancy. However, if the garage serves other occupancies in addition to the COMM 66 occupancy (such as retail stores, offices and services for which the PUBLIC will enter the building), then the attached garage will have to meet all applicable requirements of COMM 59 as well as COMM 66.*

Common Areas/Services For Tenants Only *- Some apartment complexes offer services for tenants only (such as a community room, dry cleaning drop off or even limited retail or service facilities like beauty shops). Such a core area with Chapter 54 functions requires separation in accordance with COMM 66.32(2) from the COMM 66 residential areas. A community room serving* ***tenants only*** *and their guests, such as immediate family, should be documented clearly on the plans. Similarly, a dining area serving* ***only tenants*** *should be clearly identified on the plans - otherwise*

the plan reviewer may be forced to apply more stringent COMM 55 requirements if it appears that such areas could be rented to groups (and the usage, based on 10 sq. ft./per person, could exceed 100 persons).

COMM 66.33 (2)(c) 1.a. COMM 57/66 Separations: *Due to differences in classes of construction features and automatic fire sprinkler systems coverage between COMM 57 and COMM 66 uses, the actual separation between an COMM 57 occupancy and an COMM 66 occupancy may be required to be 4-hour rated for class of construction and sprinklered/nonsprinklered separation.*

COMM 66.33 (2)(c) 1.a. COMM 57/66 Separations: *Previously, apartments and condominiums were contained in the same occupancy Chapter COMM 57 as hotels, motels, and community based residential facilities and similar occupancies. With the creation of COMM 66, mixed use between COMM 57 (such as motel, CBRF, or "transient" residential uses) and COMM 66 (non-transient multifamily residential) will occur.*

In a "mixed" COMM 57/66 building that alternates motel or other "transient" use with apartments or condominiums, the separations between dwelling units will be required to be a minimum 1-hour separation. As both COMM 57 and COMM 66 allow 20-minute fire doors into 1-hour corridors, the doors to the common corridors may continue to be 20-minute rated (although any connecting fire doors between units shall be at least 45-minute fire doors).

As described in the code, a "mixed use" building shall also meet the more restrictive height and area requirements of the applicable occupancy code chapters.

Designers with complex "mixed uses" (such as mixed Historic Building Code COMM 70 with COMM 66) may wish to schedule a preliminary design consultation if direction is needed on one or more major code issues.

COMM 66.33 (2)(c) 1.b. Occupancy Separation Ratings: *For this application, the living unit separation requirement of 5/8-Type X gypsum wallboard will be considered as 0-hour rated. Thus, where COMM 51.08 only requires a living unit separation (note i), the 1-hour increase required by COMM 66 will result in a true 1-hour assembly being required.*

(3) ATTIC COMPARTMENTALIZATION. Attics shall be compartmentalized in accordance with s. COMM 51.02 (19), except that the uncompartmentalized area may not exceed 15,000 square feet in attics containing sprinkler protection complying with NFPA 13 or in buildings having the 2-hour fire resistance required by par. (1).

COMM 66.335 ACCESS ROADWAYS FOR FIRE APPARATUS.

(1) Buildings shall be accessible to fire department apparatus by means of access roadways. An access roadway shall be at least 24 feet in width, have a driving surface capable of supporting the imposed loads of the fire apparatus during all weather conditions, be located within 50 feet of the building, extend along at least 25% of the total building perimeter, and have a minimum vertical clearance of 13 feet 6 inches. Alternate means of access not complying with the specific criteria listed in this section but receiving written approval of the local fire department shall be considered as meeting these requirements.

(2) From the access roadway, at least 50% of the building perimeter shall be reachable with 150 feet of fire hose, and the remaining perimeter shall be reachable with 250 feet of fire hose.

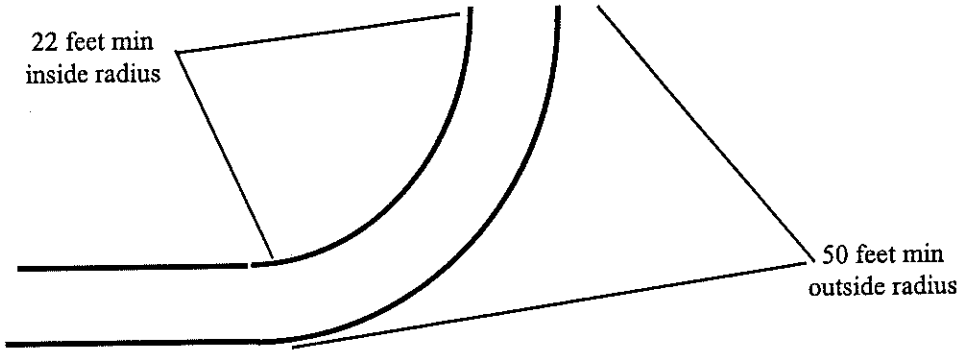
(3) The space between the access roadway and the building shall be free of permanent obstructions that may impede firefighting access, such as fences, hedges, walls, substantial grade changes, or waterways.

(4) (a) A minimum outside turning radius of 50 feet and a minimum inside turning radius of 22 feet shall be provided and maintained.

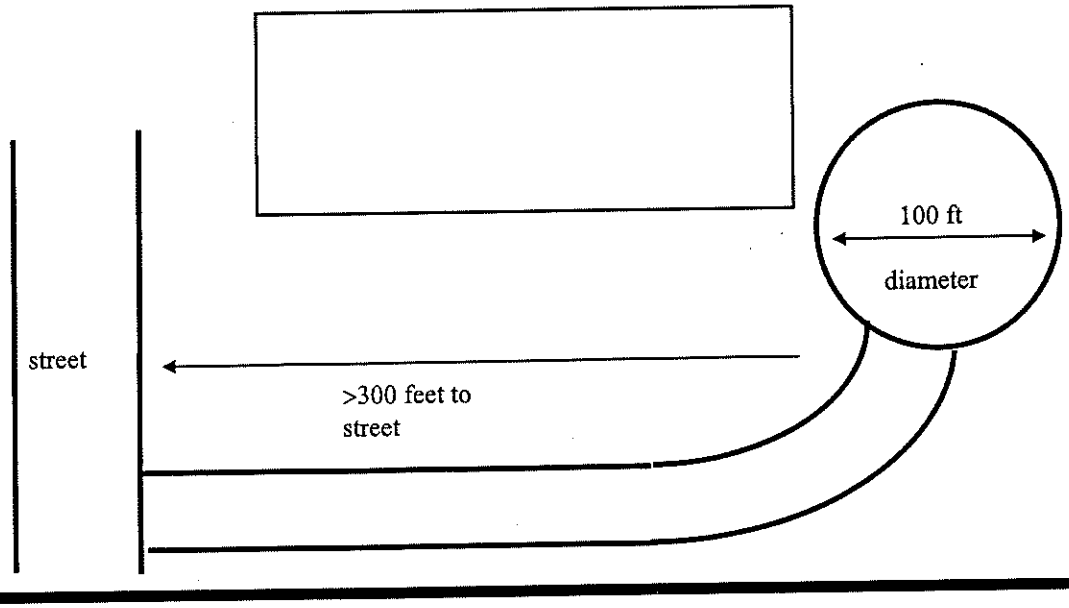
(b) A dead-end private access roadway longer than 300 feet shall have a turnaround with a minimum outside radius of 50 feet.

*COMM 66.335 (3) **Obstructions Impeding Fire Fighting:** First, note that obstructions are prohibited only if permanent. Thus, parking of vehicles between the street and the building is permitted. Secondly, the obstruction must impede firefighting access. Therefore, shrubbery, landscaping, etc., may be allowed at the discretion of the local fire chief. This will not be evaluated at the time of plan review, unless an obvious violation is apparent.*

*COMM 66.335 (4)(a) **Access Roadway Turns:** Note that this is a change from COMM 57 which allowed several options to satisfy the road requirement. Now **both** 25 percent of the perimeter within 50 feet of a street **and** two requirements for walls reachable by hose lengths are required to be satisfied. This will limit the angle of buildings oriented away from the road.*



*COMM 66.335 (4)(b) **Access Roadway Turnaround:** This section requires a turnaround at the end of dead-end access roads which are longer than 300 feet.*



(5) (a) The access roadway shall be kept free at all times of all obstructions, including parked vehicles and snow.

(b) The access roadway shall be maintained to support the imposed loads of fire apparatus during all weather conditions.

COMM 66.34 NUMBER AND LOCATION OF EXITS.

*Exit distance in multifamily occupancies is measured **from the living unit entrance** to at least one required exit. The "exit" is the actual outside exit door to which travel distance is counted, or may be the distance to a fully enclosed stair, provided the stair rating is maintained to the exterior of the building.*

(1) NUMBER OF EXITS.

(a) Except as provided in pars. (b) and (c), each dwelling unit shall have exits or exit accesses in accordance with one of the following:

1. The unit shall have at least 1 exit access door into a common area of the building arranged such that there are 2 directions of travel from the unit's exit access door, leading to separate exits.

2. The unit shall have 2 separate exits contained within the unit.

3. The unit shall be provided with 2 exit access doors into separate common areas, with each common area provided with at least 1 exit.

4. The unit shall be provided with an exit access door into a common area with at least 1 exit, in addition to an exit contained within the unit.

(b) The second exit for a dwelling unit may be through an attached garage which serves only that unit and which is provided with an exit door that discharges to grade. An overhead garage door may not be counted as an exit door.

(c) A unit with a habitable room on a floor of exit discharge may be provided with at least 1 exit, directly from the unit to the exterior, with the unit exit door sill at or within 6 feet of grade at the exit door.

***COMM 66.34 (1)(c) Habitable Room at Discharge Level:** This section requires at least one habitable room be at the floor of exit discharge for the single exit to be allowable. If this criteria is not met, two exits from the unit are required..*

(2) DISTANCE TO EXIT.

(a) 1. Except as provided in subd. 2. and s. COMM 66.36(2)(c), exits shall be distributed so that the entrance to each dwelling unit is no more than 100 feet from an exit, measuring along public passageways or corridors.

2. Where 2-hour fire resistance or fire sprinkler system protection as specified in s. COMM 66.33 (1) is provided, an increase in exit distance to 200 feet is permitted, except as provided in s. COMM 66.36 (2)(c) 2.

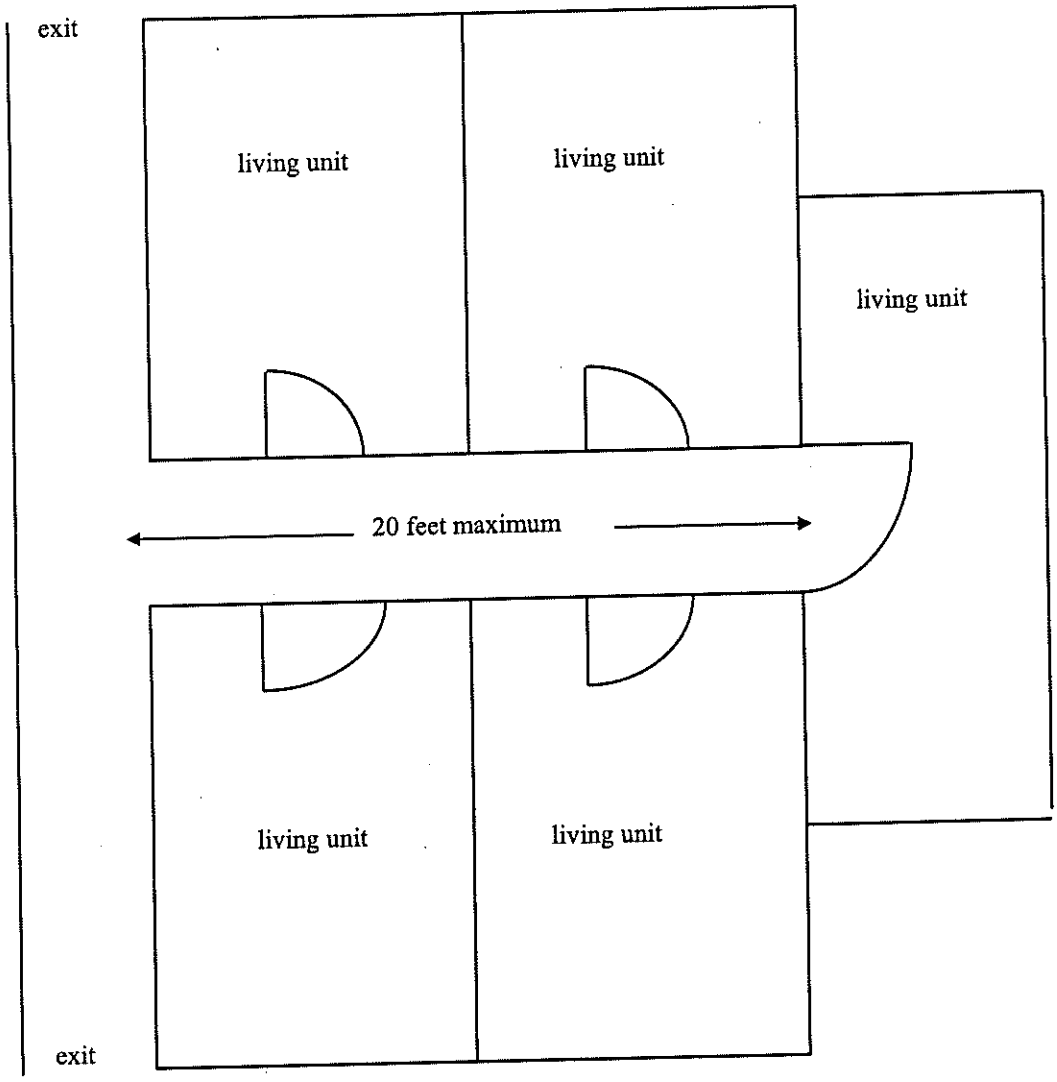
(b) The exit distances required by this section shall be measured to exits to grade, to doors leading to stairway enclosures as specified in ss. COMM 66.41 and 51.18, to horizontal exits as specified in s. COMM 51.19, or to the top of exterior stairways as specified in s. COMM 66.41 (3).

(3) EXIT DISTRIBUTION.

(a) Except as provided in par. (b), exit access passageways and corridors that serve more than one exit shall provide direct connection to those exits in 2 directions from any point in the

passageway or corridor. The angle between the 2 directions may not be less than 90°. An exit access door may be recessed no more than 3 feet into an alcove serving only that exit access, provided the alcove width is at least 3 feet.

(b) A dead-end corridor may be provided if its length to the 2 directions in par. (a) is no more than 20 feet and if the building is protected with 2-hour fire resistance or a sprinkler system as specified in s. COMM 66.33 (1). An exit access door opening into a dead-end corridor may be counted as having 2 directions of travel.



The above exiting (showing an exit access recessed up to 20 ft. from two exits or two directions of travel) is a particular exception allowed when the building is protected by 2-hour fire-resistance or a sprinkler system.

(4) EXITS FOR NONDWELLING UNIT PORTIONS OF BUILDINGS. Exits serving nondwelling unit portions of buildings shall be as specified in ss. COMM 54.02 to 54.07, or ss. COMM 55.06 to 55.10, whichever is applicable.

COMM 66.345 EGRESS WITHIN DWELLING UNITS.

(1) EGRESS FROM SLEEPING ROOMS. Every sleeping room shall have at least 2 means of egress. Windows complying with s. COMM 66.36(2)(d)3. to 6. may be used as a substitute for one of these two means of egress. This subsection does not apply to lofts as specified in sub. (2).

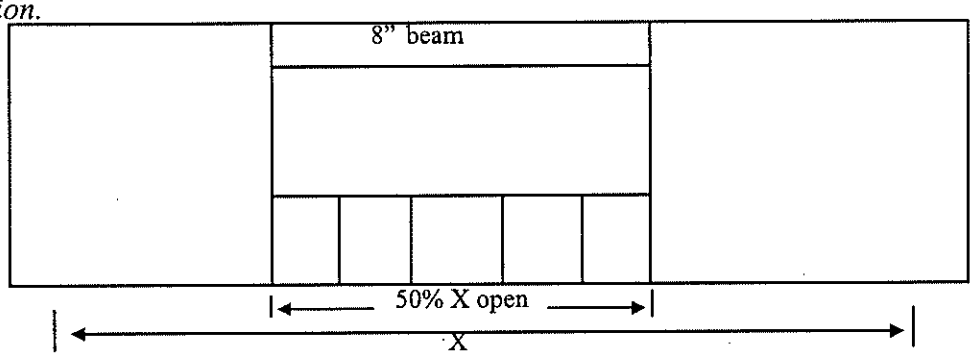
(2) LOFTS.

(a) The minimum opening in a loft's common wall to the floor below may be infringed upon by an open guardrail constructed in compliance with s. COMM 66.40, by not by a window or half-wall guardrail. All habitable rooms of a loft shall be open to the floor below.

(b) A loft exceeding 400 square feet in area shall have at least 1 stairway exit to the floor below.

(c) A loft 400 square feet or less in area shall have at least 1 stairway or ladder to the floor below. A ladder shall comply with s. COMM 66.39(4).

COMM 66.345 (2) Lofts: *This further clarifies the openness requirements for a loft defined in COMM 66.03 (5). The loft definition requires 50 percent of the common wall open to the floor below. The* ***opening*** *may be infringed upon only by an open guardrail and a maximum of an 8-inch beam projection.*



Also note ***every habitable room of the loft must be open to the floor below*** *and the area of the loft cannot exceed one-third of the area of the floor below. A bathroom is not a habitable room.*

(3) EGRESS FROM AN UPPER FLOOR OF A MULTIFAMILY DWELLING UNIT.

(a) Except as provided in sub. (2), par. (e), and s. COMM 66.39(3)(e), at least 2 means of egress shall be provided from each habitable floor above the main floor of a dwelling unit. As used in this subsection, the main floor of a dwelling unit means the floor that contains the main entrance to the unit.

(b) The means of egress shall be located such that in any case any means is blocked, some other means will still be available.

(c) At least one of the means of egress shall be a stairway or ramp that discharges to either the next lower floor, to grade, or to a common-use corridor or passageway.

(d) The second means of egress may be egress windows that comply with s. COMM 66.36(2)(d), a rescue platform that complies with s. COMM 66.36(2)(b), or a stairway or ramp which complies with par. (c) or which discharges to a rescue platform that complies with COMM 66.36(2)(b). If the upper floor does not contain any bedrooms, egress windows that otherwise comply with s. COMM 66.36(2)(d) may be provided in each habitable room on that floor, as the second means of egress from that floor.

(e) An upper floor of a rowhouse or townhouse may be provided with a single means of egress, if that means of egress is a stairway or ramp which discharges to the next lower floor, and if each dwelling unit is separated from any adjacent unit by 1-hour fire-resistive rated construction which extends from the foundation to the underside of the roof deck. This paragraph does not exempt a sleeping room on a upper floor from the requirements of sub. (1).

COMM 66.35 CAPACITY OF BUILDINGS AND EXITS.

The occupant load for determining the size of the elements of the exits shall be based on two persons for each bedroom or on actual use, whichever is greater.

COMM 66.36 TYPE OF EXITS.

(1) GENERAL. Except as provided in sub. (2)(a), at least one-half of the required exits, accessible from each dwelling unit, shall be exits to grade or stairways as specified in s. COMM 66.38. Except as provided in sub. (2)(b) to (d), the remaining exits shall be either stairways, interior enclosed stairways, exits to grade, or horizontal exits. Fire escapes placed against blank walls may be used as exits from floors which are in existing buildings and which are not more than 40 feet above grade.

(2) EXCEPTIONS.

(a) Every building which accommodates more than either one dwelling unit or 8 persons above the second story shall have at least 2 stairways.

(b) A rescue platform of combustible construction may be used as a required second exit for buildings with 3 or fewer stories, provided par. (c) and all of the following conditions are satisfied:

1. The platform serves a single dwelling unit.

2. The height of the platform floor is either at the elevation of the second story or no more than 15 feet above the adjacent grade below the platform, whichever is less. If a roof that complies with subc. 8 occurs below the platform, the grade where exit from the roof occurs is no more than 15 feet above the platform.

3. The platform area is at least 14 square feet, with a minimum dimension of 3 feet, except that if the platform is inside the building, the minimum area is 100 square feet.

4. If inside the building, the platform is separated from all other parts of the dwelling unit by 1-hour fire-resistive construction, is provided with an access door which complies with s. COMM 66.37 (2), is provided with a means to vent smoke and to supply fresh air to the occupants, and is provided with an egress opening which complies with par. (c).

5. The platform is designed for at least 80 pounds per square foot live load plus dead load.

6. Any wood used in the construction of an exterior platform is of a durable species which is resistant to decay or which is pressure-preservative treated in accord with AWPA C1, C2, or C9, as adopted by reference in s. COMM 51.25.

7. Railings which are designed and constructed to withstand a load of at least 200 pounds applied in any direction at any point are provided on the open sides of the platform, at an elevation 3 feet above the platform, and include balusters, intermediate rails, or an ornamental pattern designed such that a sphere 6 inches in diameter cannot pass through any opening in the rail.

8. The platform is accessible to firefighters and firefighting equipment. Walls, fences, substantial grade changes, or other obstructions shall not impede access to the platform. An underlying roof having a slope of less than or equal to 4 in 12 is not considered to impede access.

COMM 66.36 (2)(b) and (c) Use of Rescue Platforms:

APPLICATION APRIL 1 - AUGUST 9, 1995: While the exception in (c) 2. states that the number of dwelling units may not exceed four per floor and (2) limits rescue platform use to the second story or not more than 15 feet above grade, the department will apply this to ***each common stair module.*** *This means a two-story building could have more than 8 units (two stories, four per floor), but each 8-unit "module" would have to comply with COMM 66.36 (2)(c). No extra protection is required between living units of adjacent modules (other than the normal dwelling unit separation of COMM 66.32 (2) in sprinklered buildings and the 2-hour fire-resistance separation that would be required if the 2-hour fire-resistance option is utilized for area limits).*

Questions have been asked as to the "intent" and application of the requirement under COMM 66.36 (2)(c) 1. that the interior stair serving a ***single*** *unit shall be 1-hour rated. The "intent" of the code writers was that this be a separation from* ***adjacent dwelling units*** *and not be an interior "enclosed" stair with a door at top and bottom. In keeping with this "intent," we have NOT required an interior enclosed stair; instead, we have required that the stair area be separated from any units above, below, or alongside the stair by 1-hour fire-resistive construction.*

APPLICATION AFTER THE AUGUST 9 EMERGENCY RULE: If distance to the "primary exit" does not exceed 35 feet, as measured from the unit entrance to either a rated stair enclosure or the outside exit door if no enclosure is provided, the secondary exit may be a rescue platform that complies with COMM 66.36 (2)(b).

COMM 66.36 (2) (b) 4. Interior Rescue Platforms: *Where rescue platforms or egress windows are allowed as exits, the rescue platform may be an interior room separated by 1-hour walls and floor/ceiling systems from other parts of the dwelling unit. The access door from the unit to the interior rescue platform shall be a 20-minute rated door. Also, a means to vent smoke and supply fresh air must be provided.*

(c) Where a rescue platform or egress windows are provided as the second required exit, the distance to primary exit may not exceed 35 feet.

(d) *Windows used for exiting.*

1. Windows that are installed for exit purposes shall be limited in accordance with par. (c) and shall comply with the requirements of this paragraph.

2. A window complying with this paragraph shall be provided in each bedroom.

3. The window shall be accessible to firefighters and firefighting equipment. Walls, fences, substantial grade changes, or other obstructions shall not impede access to the window. An underlying roof having a slope of less than or equal to 4 in 12 is not considered to impede access.

4. The window shall be openable from the inside without the use of tools or the removal of a sash. If equipped with a storm or screen, the storm or screen shall be openable from the inside.

5. a. The nominal size of the net clear window opening shall be at least 20 inches in width by 24 inches in height. Nominal dimensions shall be determined by rounding up

fractions of inches if they are 1/2 inch or greater or rounding down fractions of inches if they are less than 1/2 inch.

b. Except as provided in subpar. c., no portion of the window, including stops, stools, meeting rails, and operator arms of an awning window, may infringe on the required opening.

c. The movable sash of a casement window may infringe on the required opening width. The net clear opening width of a casement window shall be measured between the stops.

*Please note that the operator arms, controls, rails etc are **not** allowed to intrude into the required 20 inch wide by 24 inch high clear opening of a casement or awning window. Only the moveable sash of a casement window is allowed to infringe on the opening width as noted above.*

d. The area and dimension requirements of subpar. a. may be infringed on by a storm window.

6. The sill height may not be more than 46 inches above the floor or the top of a permanent platform, with or without steps, installed below the window. The platform and steps, if provided, shall be as wide as the actual egress opening and have a minimum tread depth of 9 inches and maximum riser height of 8 inches.

7. The bottom of the window opening shall be no more than 15 feet above the adjacent grade directly below the window.

8. If a window that is provided as an exit is located below grade, an areaway shall be provided. The width of the areaway shall be at least equal to the width of the exit window. The bottom of the areaway may not be more than 46 inches below grade. The areaway length shall be at least 1 1/2 times the depth of the bottom of the opening with a minimum of 3 feet measured perpendicular to the building wall. The areaway shall be constructed to prevent rainfall flowing into the areaway from entering the dwelling.

COMM 66.37 DOORS.

(1) EXIT AND EXIT ACCESS DOORS.

(a) *General.* Except as provided in par. (b), exit doors shall be swinging doors that open in the direction of egress. Exit doors shall have a width of at least 36 inches and shall meet the minimum aggregate width requirements in s. COMM 66.42 (3)(c) and (d).

(b) *Exceptions.*

1. A sliding, glazed patio-type door may serve as the second exit from an individual dwelling unit if there is a means to prevent accumulation of snow and ice in the door track or freezing of the door. Permanent obstructions, such as electric baseboard heating units, may not be installed in front of patio doors.

2. A door which is used by not more than 25 persons is not required to open in the direction of egress.

3. A secondary exit door from a dwelling unit may have a clear opening of no less than 32 inches.

*COMM 66.37 (1)(b) 3. **Door Width:** Caution: the 32-inch allowable door width is the **clear opening** dimension. This door must also satisfy the appropriate barrier-free requirements.*

(c) *Door heights.* Primary exit doors shall have a height of at least 6 feet 8 inches. All other exit doors shall have a height of at least 6 feet 4 inches.

(d) *Door hardware.* Dwelling unit exit doors and exit doors serving nondwelling unit portions of buildings containing 10 or fewer dwelling units may have dead bolt locks that are not interconnected with the door latch. Locks needing a key for unlocking from the inside are prohibited.

*COMM 66.37 (1)(d) **Door Hardware:** The intent of this section is to:*

1. Allow all dwelling units in any multifamily building to use deadbolts for security within that unit.

2. Allow exit doors in corridors of buildings with ten or less units to have deadbolt locks. These will require some sort of unlocking mechanism from the outside to allow residents entry into the building.

3. Only a single deadbolt may be used. The intent is to allow one extra motion from the normally applied single turn or push action for exiting. Remember, a key shall not be required to open the door from the occupied side.

(2) OPENINGS INTO CORRIDORS.

(a) All doors opening into public exit access corridors shall be self-closing or automatic-closing, except that any fire door extending across a corridor shall have an automatic-closing device which is activated by a smoke detector complying with s. COMM 66.49 (3) and (4). Except as provided in par. (b), the door openings shall be protected by at least 20-minute labeled fire-door assemblies.

(b) 1. In a building having the sprinkler protection specified in s. COMM 66.33 (1), the fire-resistive rating for a door opening from a dwelling unit into a corridor may be applied to only the door, rather than to the door assembly. A listed door assembly is not required at this location.

2. In a building having the 2-hour fire-resistance specified in s. COMM 66.33 (1), any dwelling unit door opening into an exit access corridor shall be protected by at least a 1 1/2-hour labeled fire-door assembly.

COMM 66.38 EXIT STEPS, STAIRS, AND RAMPS IN NONDWELLING UNIT PORTIONS.

(1) Exit steps, stairs, and ramps in nondwelling unit portions shall comply with this section.

*COMM 66.38/66.39 **Storage Areas Under Stairs:** No specific requirements are called for regarding storage spaces under stairs. Designers should be aware, however, that any required fire-resistive ratings must be maintained. A separation between another occupancy or a residential garage separation per COMM 66.32 (4) may require a rated wall and/or ceiling at this location.*

(2) REQUIRED WIDTH.

(a) Stairs or ramps shall have a width of at least 36 inches and shall meet the minimum aggregate width requirements in s. COMM 66.42 (3)(c) and (d). No more than 4 inches of each side of the minimum width may be occupied by any obstruction, such as handrails, stringers, or baseboard heating units.

(b) Under no circumstances may stairways or ramps decrease in width in the line of travel toward an exit.

(3) HEADROOM. The headroom clearance shall be at least 6 feet 8 inches. In stairways, the minimum clearance shall be measured vertically from a line parallel to the nosing of the treads to the ceiling or soffit directly above that line.

(4) RISERS, TREADS, AND RAMP SLOPES.

(a) 1. Except as provided in subd. 2, all stairways and steps shall have a rise of not more than 7 3/4 inches, measured from tread to tread, and a tread of not less than 9 1/2 inches, measured from nosing to nosing of tread. The slope of a tread may not exceed 1/4 inch per foot for the depth of the tread. Treads and risers shall be uniform in any one flight. Winders may not be used.

2. Stairs on required barrier-free accessible routes connecting levels that are not connected by an elevator shall comply with all of the following:

Note: Stairs adjacent to an accessible ramp are considered to be stairs on an accessible route.

a. Steps shall have a rise of not more than 7 inches, measured from tread to tread.

b. Steps shall have a tread of not less than 11 inches, measured from nosing to nosing of tread.

c. Open risers may not be used.

(b) The edges of all treads and the edges of all stairway landings shall be finished with a slip-resistant surface at least 3 inches in width.

(c) Where an exit door leads to an outside platform or sidewalk, the level of the platform or sidewalk may not be more than 7 3/4 inches below the doorsill, except as provided in s. COMM 57.82 for a required barrier-free accessible route.

(d) 1. Except as provided in subd. 2., every stairway shall have at least 3 risers.

2. Exterior stairs with less than 3 risers may be provided between exterior platforms and grade if the total length of the platforms and treads does not exceed 5 feet in the direction of travel.

(e) No flight of stairs may exceed 12 feet in height unless intermediate landings are provided.

(f) Ramp slopes may not exceed 1:12. At-grade walkways with gradients less than 1:20 are not considered to be ramps.

(g) Ramps and their landings shall be finished with a slip-resistant surface.

Note: A coefficient of friction of 0.5 or greater is considered to be slip-resistant, except that a coefficient of 0.6 is recommended for accessible routes, and a coefficient of 0.8 is recommended for ramps.

(5) LANDINGS AND PLATFORMS.

(a) 1. Where a door is at the top or bottom of a ramp or stairs, a landing or platform shall be placed between the door and the stairway or ramp, regardless of the swing of the door, except as provided in subd. 2.

2. Platforms may be omitted for ramps 6 feet or less in length.

Note: Chapter COMM 69 and subch. II of ch. COMM 57 do not allow omission of platforms on required barrier-free accessible routes.

(b) Every landing or platform shall be at least as wide as the stairway or ramp, measured at right angles to the direction of travel, and shall be at least 3 feet in length, measured in the direction of travel.

(6) CURVED STAIRS. Curved stairs used as required exits shall have a minimum radius at the interior edge of the tread of twice the stair width and shall have a minimum tread depth of 11 inches, as measured 12 inches from the narrower end of the tread.

(7) EXTERIOR STAIRS. Exterior stairs for nondwelling unit portions shall comply with this section.

Note: COMM 66.41 (3) requires primary exit stairs to be enclosed for protection against the elements. See that section for more information.

COMM 66.39 STEPS, STAIRS, AND RAMPS WITHIN DWELLING UNITS.

(1) CHANGES IN ELEVATION WITHIN INDIVIDUAL DWELLING UNITS. Changes of elevation within a dwelling unit shall be overcome by means of steps, stairs, ladders, or ramps and shall be as specified in this section. Access to an attic or crawlspace is exempt from these requirements.

(2) LANDINGS.

(a) *Intermediate landings.* Intermediate landings located in a flight of stairs shall be at least as wide as the stairs and shall measure at least 3 feet in the direction of travel.

(b) *Landings at the top and base of stairs.* A level landing shall be provided at the top and at the foot of every flight of stairs. The landing shall be at least as wide as the stairs and shall measure at least 3 feet in the direction of travel.

(c) *Obstructions.* No more than 4 inches of each side of the minimum landing width may be occupied by any obstruction, such as handrails, stringers, or baseboard heating units.

(d) *Landings at doors.*

1. Except as provided in subds. 2. to 5., level landings shall be provided on each side of any door located at the foot or head of a stairway, regardless of the door swing. In the application of the exceptions given in subds. 2. to 5., stairways to attached garages or porches are considered to be interior stairways.

2. A landing may not be required between a door and the head of interior stairs if the door does not swing over the stairs.

3. A landing may not be required between a door and the head of an interior stairway of 2 or fewer risers, regardless of the door swing.

4. A landing may not be required between a sliding glass door and the head of an exterior stairway of 3 or fewer risers.

5. An exterior landing, platform, or sidewalk at an exterior doorway may not be more than 8 inches below the interior floor elevation and, except as provided in s. COMM 57.84 for barrier-free accessible routes, shall have a length at least equal to the width of the door.

(3) STAIRS.

(a) *Minimum width.* Every stair shall measure at least 3 feet in width. No more than 4 inches of each side of the minimum width may be occupied by any obstruction, such as handrails, stringers, or baseboard heating units.

(b) *Headroom.* Except as provided in par. (e), every stair shall have a minimum headroom clearance of 6 feet 4 inches. The minimum clearance shall be measured vertically from a line parallel to the nosing of the treads to the ceiling or soffit directly above that line.

(c) *Treads and risers.* Risers may not exceed 8 inches, measured vertically from tread to tread. Treads shall be at least 9 inches deep, measured horizontally from nosing to nosing. There shall be no variation in uniformity exceeding 3/16 inch in the depth of treads or in the height of risers. The slope of a tread may not exceed 1/4 inch per foot for the depth of the tread. Riser and tread dimensions should be measured prior to application of finish materials. No flight of stairs may exceed 12 feet in height unless intermediate landings are provided.

(d) *Winders.* Winder steps may be used in a flight of stairs where the width of the tread is at least 3 feet and the winder tread measures at least 7 inches in depth at a point 12 inches from the narrow end of the tread.

(e) *Spiral stairways.* A spiral stairway may serve as the only exit from a floor level that is no larger than 400 square feet. The minimum tread width shall be 26 inches, with each tread having a 7 inch minimum tread depth at 12 inches from the narrow edge. All treads shall be identical, and the rise may not be more than 9 1/2 inches. A minimum headroom of 6 feet 6 inches shall be provided. The minimum clearance shall be measured vertically from a line parallel to the nosing of the treads to the nearest obstruction directly above that line.

(4) LADDERS.

(a) *General.* Ladders that are used as part of a required exit access shall conform to this subsection.

(b) *Design load.* Ladders shall be designed to withstand vertical loads of at least 300 pounds.

(c) *Tread or rungs.*

1. Minimum tread dimensions shall be as specified in Table 66.39. Treads less than 9 inches in depth shall have open risers. All treads shall be uniform in dimension.

TABLE 66.39
LADDER TREADS AND RISERS

Pitch of Ladder Angle to Horizontal (degrees)	Maximum Rise (inches)	Minimum Tread (inches)
41.6 to 48.4	8	9
greater than 48.4 to 55.0	9	8
greater than 55.0 to 61.4	10	7
greater than 61.4 to 67.4	11	6
greater than 67.4 to 71.6	12	5
greater than 71.6 to 75.9	12	4*
greater than 75.9 to 80.5	12	3*
greater than 80.5 to 90	12	2*

* Minimum tread dimensions do not apply to rungs.

2. Rungs may only be used for ladders with a pitch range of 75° to 90°. Rungs shall be at least 1 inch in diameter for metal ladders and 1 1/2 inches for wood ladders. All rungs shall be uniform in dimension.

(d) *Risers.* Risers shall be uniform in height and shall conform with Table 66.39.

(e) *Width.* The width of the ladder shall be at least 20 inches and no more than 30 inches.

(f) *Handrails.*

1. Handrails are required for a ladder with a pitch of less than 65°.

2. The top of the handrail shall be mounted between 30 and 34 inches above the nosing of the treads.

3. Open handrails shall comply with s. COMM 66.40 (3) (c). All handrails shall comply with s. COMM 66.40 (3) (d) and (e).

(g) *Clearances.*

1. A ladder shall have a clearance of at least 15 inches on either side of the center of the tread.

2. The edge of the tread nearest to the wall behind the ladder shall be separated from the wall by at least 7 inches.

3. A passageway clearance of at least 30 inches shall be provided parallel to the slope of a 90° ladder. A passageway clearance of at least 36 inches shall be provided parallel to the slope of a 75° ladder. Clearances for intermediate pitches shall vary between these 2 limits in proportion to the slope.

4. For ladders with a pitch of less than 75°, the vertical clearance above any tread to an overhead obstruction shall be at least 6 feet 4 inches, measured from the tread edge that is furthest from the wall behind the ladder.

COMM 66.40 HANDRAILS AND GUARDRAILS.

(1) HANDRAIL LOCATIONS. Handrails shall be provided on stairs and ramps in all of the following conditions:

(a) On either side of any interior stairway of more than 3 risers and for any ramp overcoming a change in elevation of more than 24 inches.

(b) On any open side of a stairway with more than 3 risers and on any open side of a ramp overcoming a change in elevation of more than 24 inches.

(c) On both sides of an interior stairway or ramp 5 feet or more in width.

(d) To divide an interior stairway or ramp more than 8 feet wide into widths which are less than 8 feet and which comply with s. COMM 66.38 (2).

(e) On both sides of an exterior stairway with more than 3 risers and on both sides of an exterior ramp overcoming a change of elevation of more than 24 inches.

(f) To divide an exterior stairway or ramp more than 25 feet wide into widths which are less than 25 feet and which comply with s. COMM 66.38 (2).

(2) GUARDRAIL LOCATIONS. All openings between floors or at open sides of landings, platforms, balconies, and porches that are more than 24 inches above grade or above a floor shall be protected with guardrails.

(3) HANDRAIL AND GUARDRAIL DETAILS.

(a) *Height.* The top of a handrail gripping surface shall be mounted between 34 and 38 inches above the nosing of the treads on stairways or above the surface of ramps. Guardrails in dwelling units shall extend to at least 36 inches above the upper surface of the floor. Guardrails in nondwelling unit portions shall extend at least 42 inches above the upper surface of the floor.

(b) *Handgrip Dimensions.* The handgrip portion of a handrail serving a stairway or ramp may not be less than 1 1/4 inches nor more than 2 5/8 inches in any horizontal cross-sectional dimension, or may be any other shape with a perimeter dimension of at least 4 inches but not greater than 6 1/4 inches and with the largest cross-sectional dimension not exceeding 2 1/4 inches.

Note: See s. COMM 57.82 for handrail requirements at stairs on required barrier-free accessible routes.

(c) *Openings.* Open guardrails or handrails shall have balusters, intermediate rails, or an ornamental pattern designed such that a sphere 6 inches in diameter cannot pass through any opening between the rail and the stair, ramp, or floor.

(d) *Wall clearance.* The clearance between a handrail and a wall surface shall be at least 1 1/2 inches.

(e) *Loading.* Handrails and guardrails shall be designed and constructed to withstand a 200-pound load applied in any direction, at any point.

(4) EXTERIOR RAILS. Exterior handrails and guardrails shall be constructed of metal, concrete, masonry, or plastic, or of wood that is either decay resistant, protected from the weather, or pressure treated in accord with AWPA C1, C2, or C9, as adopted by reference in s. COMM 51.25.

COMM 66.41 ENCLOSURE OF SHAFTS, EXIT STAIRWAYS, AND OTHER VERTICAL OPENINGS.

(1) INTERIOR SHAFTS AND EXIT STAIRWAYS. Except as provided in sub. (4), all shafts and exit stairways, including landings and ramps and other vertical openings, shall be enclosed with 2-hour fire-resistance construction in buildings 4 to 6 stories in height and shall be enclosed with 1-hour fire-resistive construction in buildings 3 stories or less in height. Where the building is protected with an automatic fire sprinkler system in accordance with s. COMM 66.33 (1), the enclosure walls may be of 1-hour construction.

As in the Commercial Building Code, an enclosed stair will need to maintain the required enclosure rating at the uppermost ceiling (either through the use of discontinuous framing, so that the fire-resistive rated walls go to the underside of the roof deck OR by use of an appropriately rated fire resistive assembly at the uppermost ceiling of the stair). A ceiling "finish" is ***not*** *acceptable at the stair "cap", as the stair must be protected from the attic space (and the finish will not accomplish this). Some designers have chosen to construct an appropriately rated floor-ceiling assembly beneath the roof trusses (where it is impractical to change the clear span trusses and adequate headroom exists) – this is an acceptable means to protect the stair. See Commercial Code Commentary under COMM 51.042 for a more complete discussion of this issue.*

(2) INSULATION.

(a) *Walls.*

1. Except as provided in subd. 2., mineral fiber or glass fiber type insulation that is not specified as part of a fire-tested wall or partition system may be used to fill the cavity spaces of the wall enclosures specified in sub. (1). The thickness of any insulation provided under this paragraph may not exceed the stud depth.

2. Glass fiber type insulation may not be substituted for mineral fiber type insulation that is included in a fire-tested wall or partition system.

(b) *Floor-ceiling and roof-ceiling assemblies.* The cavity spaces in the fire-tested floor-ceiling and roof-ceiling systems for the enclosures specified in sub. (1) may not be altered from the tested condition except as provided in s. COMM 66.32 (5).

(3) EXTERIOR EXIT STAIRWAYS.

(a) An exterior exit stairway that is not enclosed in accord with sub. (1) may be provided if constructed in accord with this subsection.

(b) An outside wooden stairway may serve as a required exit for buildings up to 2 stories in height.

(c) The exterior wall against which the stairway is placed shall comply with Table 51.03-A.

(d) A stairway without an enclosure having fire-resistance equivalent to the building served shall be limited to a secondary exit.

(e) The stairway shall be protected from the weather.

(f) Openings in fire-rated or weather enclosures shall comply with Table 51.03-B.

(g) The stairway height shall be limited in accordance with Table 51.03-C except a stair penthouse may be provided above that limit.

*COMM 66.41 (3) **Exterior Exit Stairways:** This section addresses stairways located at the building perimeter (also see COMM 51.18 commentary). Several features are different from the commercial code as follows:*

1. To be a primary exit stair, an "exterior" stair shall be enclosed from the elements (see (d) above). Stairways which only serve exit doors 6 feet or less above grade or which serve nonrequired exits are not required to have a roof/weatherproof wall enclosure.

2. A wooden stairway may be used for 1- and 2-story buildings. A noncombustible stairway must be used for buildings 3 stories or more. COMM 66.38 or COMM 66.39, whichever is applicable, governs the rise, run, landings, etc.

3. The intent of (c) is that the building wall separating the building from the stairway satisfies the fire rating in line 20 of Table 51.03-A for stair enclosures.

4. Since (d) specifies this type of stairway may only be used as a second exit, the main stairway must be enclosed as per COMM 66.41 (1). The main stairway will be that most likely to be used by the building residents (i.e., closest to resident's parking or, if no parking is provided, the front entrance).

5. It is the intent that COMM 66.41 (4) exceptions for open shafts or stairways apply only to (1) requirements for interior shafts and stairways.

(4) EXCEPTIONS.

(a) A shaft or exit access stairway connecting any two adjacent floor levels in a residential building 3 stories or less in height may be left open where all of the following conditions are satisfied:

1. Every shaft or exit access stairway to the basement or ground floor is cut off with 1-hour fire-resistive construction at the first floor, first adjacent basement, or ground floor level.

2. The exit access travel distance to an exit, including the horizontal travel distance on the exit access stair, does not exceed 100 feet in buildings not protected with 2-hour fire

resistance or an automatic fire sprinkler system, or 150 feet in buildings protected with 2-hour fire resistance or a sprinkler system as specified in s. COMM 66.33 (1). The exit access travel distance shall be measured from the entrance door of the dwelling unit along public passageways or corridors to an approved exit.

(b) A vertical opening serving 2 floor levels need not be enclosed if all of the following conditions are met:

1. The opening is not a required means of egress.

2. The opening is separated from any exit access corridor or exit stairway by fire-resistive rated construction with at least the hourly rating specified for fire-rated enclosures in line 20 of Table 51.03-A.

(c) Vertical openings serving and contained within individual dwelling units are not required to be enclosed.

COMM 66.42 EXIT ACCESS CORRIDORS.

(1) WHERE REQUIRED. Where there is not direct access to outside exit doors from a dwelling unit, an exit access corridor leading directly to an exit shall be provided and maintained at all times.

(2) GENERAL.

(a) *Nonprotected construction.* Except in buildings having 2-hour fire resistance and except as specified in par. (b), exit access corridors shall be enclosed with walls providing a minimum of 1-hour fire-resistive construction. The construction specified in s. COMM 66.32 (2)(a) for 5/8-inch type X gypsum wallboard or its equivalent shall be considered as meeting this requirement.

(b) *Protected construction.*

1. In a building protected with a sprinkler system in accordance with s. COMM 66.33 (1), and except as provided in ss. COMM 66.33 (2)(a), exit access corridor walls may be of 30-minute fire-resistive construction. The 1/2-inch type X wallboard construction specified in s. COMM 66.32 (2) shall be considered as meeting this requirement.

2. In a building having 2-hour fire resistance, exit access corridor walls may be of 4-inch nominal masonry construction.

Windows in exit access corridors will require protection (see COMM 51.048 as adopted by COMM 66.60). The intent is that the exit access corridor be protected against fire and smoke from individual dwelling units (and vice versa).

(3) MINIMUM WIDTH.

(a) Except as provided in par. (b), a public passageway or corridor leading to an exit shall have a width of at least 44 inches and shall meet the minimum aggregate width requirements of pars. (c) and (d). Building objects, such as radiators or pipes, may protrude no more than 4 inches into each side of the minimum width.

(b) Corridors with a required capacity of 50 or less shall have a width of at least 36 inches.

(c) The minimum aggregate width of exits from a level shall be determined as follows by using the full occupant load of that level plus the percentage effects of the occupant loads of adjacent levels, above and below, which exit through it:

1. 50% of the occupant load of each first-adjacent level.

2. 25% of the occupant load of each second-adjacent level.

(d) The minimum aggregate width shall be based upon the following ratios:

1. Types 1 through 4 construction unsprinklered, 40 inches per 100 persons.
2. Types 5 through 8 construction unsprinklered, 50 inches per 100 persons.
3. Types 1 through 4 construction sprinklered, 30 inches per 100 persons.
4. Types 5 through 8 construction sprinklered, 40 inches per 100 persons.

Note: See Appendix A for a sample determination of total aggregate exit width.

(4) MAINTENANCE. The minimum aggregate width shall be kept clear and unobstructed at all times, except as provided in (3)(a).

COMM 66.43 ILLUMINATION OF EXITS AND EXIT SIGNS.

(1) ILLUMINATION.

(a) Buildings having more than 4 dwelling units shall have public passageways, stairways, and exit doors illuminated from one hour after sunset to one hour before sunrise.

(b) The illumination requirements specified in par. (a) shall be provided at all intersections or passageways, at all exits, and at the head, foot, and landing of every stairway.

*See COMM 73.04 for minimum lighting requirements **other** than emergency lighting.*

Also, Effective 4-1-97, energy conservation requirements were been established for lighting in common areas when the lighting is powered off the building electrical service.

(2) EXIT SIGNS.

(a) Except as provided in par. (d), every required exit shall be identified by an illuminated, translucent exit sign conforming to par. (b).

(b) 1. An exit sign shall bear the words "EXIT" or "OUT."

2. The wording for the exit sign shall be of letters not less than 6 inches high with principal strokes of letters not less than 3/4 inch wide.

3. The wording for the exit sign shall be of red or green lettering on a contrasting background.

4. A self-luminous type of exit sign which provides evenly illuminated letters shall have a minimum luminance of 0.06 foot-lamberts. Other types of exit signs shall be illuminated by a source providing not less than 5 foot-candles at the illuminated surface.

(c) Where exit doors are not readily visible to occupants, directional exit signs shall be provided in exit access corridors and other appropriate locations so as to indicate the direction and way of egress.

(d) 1. Exits within an individual dwelling unit need not be provided with exit signs.

2. Exits in buildings having 4 dwelling units or less per floor need not be provided with exit signs if the building contains not more than 8 dwelling units and the path of exit from all floor levels, including the basement to the outside, is readily apparent.

COMM 66.44 HABITABLE ROOMS WITH FLOORS BELOW GRADE.

(1) WINDOWS. Except as provided in sub. (3), every habitable room with a floor level below grade shall have at least one outside window that can be opened from the inside without the use of tools. The window shall have a clear opening of not less than 20 inches in width, 24 inches in

height, and 5.7 square feet in area, with the bottom of the opening not more than 46 inches above the floor.

(2) MOISTURE PROTECTION.

(a) All buildings having dwelling units below grade shall be designed and constructed to prevent undue collection of moisture in all stories below grade.

(b) Provisions shall be made to prevent the accumulation of condensation so as to prevent slippery floors and to prevent conditions susceptible to mildew or other undesirable fungi or bacteria. The inside design conditions for cooling or dehumidification shall be a dry-bulb temperature of 75°F and a relative humidity not greater than 50%.

(3) HOUSING FOR THE ELDERLY. Living units in housing for the elderly having habitable rooms or parts on floor levels below grade shall have at least one exterior wall with a full exterior exposure from the ground floor to the ceiling. The exterior exposure shall not be made by the construction of an areaway.

COMM 66.45 SANITARY FACILITIES.

(1) TOILET ROOMS. Every dwelling unit shall include a toilet room.

(2) SANITARY FIXTURES.

(a) *Within dwelling units.* A minimum of one bathtub or shower, one lavatory, and one water closet shall be provided in every dwelling unit. Water closets may be of a round-bowl type with a hinged, closed-front seat.

(b) *Other areas.*

1. Except as provided in subd. 2., common use areas within a multifamily dwelling which are larger than 400 square feet and which serve patrons who do not reside within that dwelling shall be provided with sanitary fixtures in accordance with Table 66.45.

COMM 66.45 (2)(b) Sanitary Facilities for Common Use Areas: *The intent of this section is to provide public sanitary facilities for recreational areas, lounges, TV rooms, etc., which are larger than 400 square feet and are likely to be used by either residents to entertain their guests or by groups which are not residents. Several of these rooms may share common sanitary facilities similar to Chapter 54 or 55 uses.*

General entrance lobby, mailbox area, or laundry areas without other facilities will not be considered "common use" areas under this code section.

COMM 66.45 (2)(b) 3. Employee Sanitary Facilities: *The intent of this section is to follow the same logic as currently done in COMM 57. The sanitary facilities for the complex's rental office, maintenance office, model unit, etc., may be used to satisfy the requirement for permanent employees.*

TABLE 66.45

NUMBER OF SANITARY FIXTURES REQUIRED FOR COMMON USE AREAS[1,2,3]

Number of Patrons/Occupants of Each Sex	Type of Fixture				
	Water Closets (WC)			Drinking	
	Males (M)	Females (F)	Urinals (U)	Facilities (DF)	Lavatories[4] (L)
1 - 100	1	1	0	One (DF) for each 150 occupants or fraction up to 600	One (L) for each 2 fixtures (WC) or (U) required or fraction
101 - 200	1	2	1		
201 - 250	1	3	2		
251 - 300	1	4	2		
301 - 350	2	5	2		
351 - 400	2	6	2		
401 - 450	2	7	3		
451 - 500	2	8	3		
501 - 600	2	9	4		
Over 600	One (WC) for each additional 600 (M) or 275 (F) or fraction		One (U) for each additional 500 (M) or fraction	One additional (DF) for each additional 3,000 occupants or fraction	

[1] For structures with additions or alterations, the required number of sanitary fixtures shall be the sum of the fixtures required for the existing portion at the time it was constructed plus the fixtures required by this table for the new addition or altered area. At such time as the summation of the addition and alteration area is equal to or greater than 51% of the building area calculated as specified in s. COMM 50.03 (4)(d), fixtures shall be provided in conformance to this table utilizing the capacity of the entire building.

[2] The determination of the number of each sex shall be based on an equal number of each sex unless other information is made available to the department and accepted. Where a single toilet room designated as UNISEX is provided, it shall be considered as accommodating no more than 10 employes and 24 occupants.

[3] The capacity of facilities shall be calculated in accord with s. COMM 54.05 or 55.06, whichever is applicable.

[4] A minimum of one lavatory shall be provided in each toilet room.

2. Swimming pool facilities shall be provided with sanitary fixtures in accordance with ss. COMM 90.16 and 54.05.

3. Sanitary facilities for employes who do not reside in the building shall be provided as specified in Table 54.12-B. Separate toilet rooms for employes and the patrons need not be provided if the toilet rooms are accessible to both employes and the patrons during all hours of operation.

(3) KITCHEN SINK. One kitchen sink that is equipped with hot and cold running water shall be provided in every dwelling unit.

COMM 66.46 NATURAL LIGHT AND VENTILATION.

The Multifamily Code does not have a separate definition for "habitable" rooms. Therefore, the definition from the Commercial Building Code (COMM 51.01(67a) applies. In keeping with this, all bedrooms, living rooms and sleeping rooms are considered "habitable". However, if a dwelling unit has more than one "living room" (living room, family room, recreation room, den, etc.), only the primary living room need meet the requirements for windows in habitable rooms as outlined in

this section. Any other "habitable" room requirements must be met. Bathrooms, kitchen, dining rooms, closets and other accessory rooms are not considered "habitable" rooms.

(1) Every habitable room shall be provided with natural light by means of glazed openings.

(2) Glazed openings shall consist of windows, skylights, or glazed doors, or a combination of the three, except that no more than 25% of the minimum required light for a dwelling unit may be provided with skylights.

(3) The area of glazed openings shall equal at least 8% of the floor area of the room served.

(4) Glazed openings serving habitable rooms shall view onto the outside.

The revised heating and ventilating standards adopted 4-1-97 allow substitution of mechanical air for the 4% openables in living rooms and sleeping rooms at a rate of 30 cfm/room. Please note, however, that at least one openable egress size window will still be required in each sleeping room (see COMM 66.345(1)) even if mechanical ventilation is provided in lieu of the 4% openables. See Table COMM 64.05 and note 4 for more information.

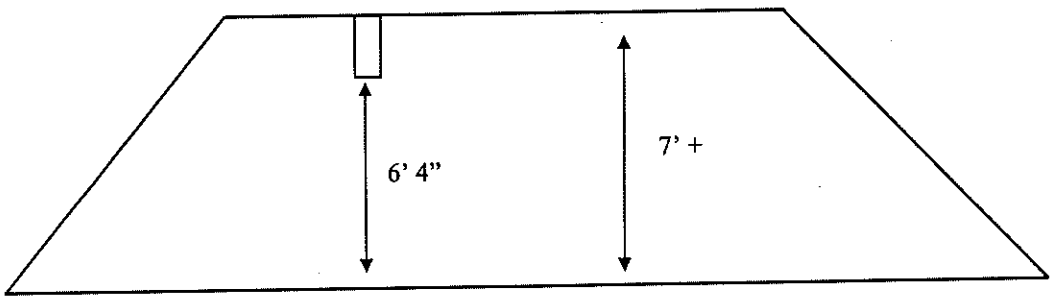
COMM 66.465 CEILING HEIGHT.

(1) WITHIN DWELLING UNITS.

(a) All rooms within a dwelling unit, including hallways, shall have a ceiling height of at least 7 feet except as provided in par. (b) and subs. (3) and (4).

(b) Ceiling heights of less than 7 feet may be provided if at least 50% of the room's floor area has a ceiling height of at least 7 feet.

*COMM 66.465 Ceiling Height: At least 50 percent of a **room's** ceiling height must be 7 feet or greater. Projections may extend 8 inches into the required height.*



There is no ceiling height requirement for storage or mechanical rooms. All public hallways or corridors must have at least 6-foot 8-inch headroom.

(2) NONDWELLING UNIT PORTIONS. All rooms in nondwelling unit portions, including hallways and corridors, shall have a ceiling height of at least 6 feet 8 inches except as provided in subs. (3) and (4).

(3) PROJECTIONS. Beams and girders or other projections may not extend more than 8 inches below the required ceiling height. No projection may extend below the required ceiling height within the required minimum width in public hallways and corridors.

(4) EXEMPTION. This section does not apply to storage and mechanical rooms.

Note: See s. COMM 66.38 (4) and 66.39 (3)(b) for the minimum headroom clearance in stairways.

COMM 66.466 RECYCLING SPACE.

All multifamily dwellings shall provide recycling space conforming to s. COMM 52.24.

COMM 66.47 ISOLATION OF HAZARDS.

(1) TWO-HOUR ENCLOSURES. Except as provided in sub. (3), a 2-hour fire-resistive rated enclosure shall be provided for all rooms in a 3- to 6-story building that are used for storage of flammable or combustible liquids, trash collection, or other similar hazards. Isolation of heating equipment shall comply with ss. COMM 64.21 and 64.22. Flammable and combustible liquid isolations shall also comply with ch. COMM 10. If the building is protected with an automatic fire sprinkler system in accordance with s. COMM 66.33 (1), the isolation may be reduced to a 1-hour fire-resistive rated enclosure.

(2) ONE-HOUR ENCLOSURES. Except as provided in sub. (3), a 1-hour fire-resistive rated enclosure shall be provided for all rooms in a 2-story or shorter building that are used for storage of flammable or combustible liquids, trash collection, or other similar hazards. Isolation of heating equipment shall comply with ss. COMM 64.21 and 64.22. Flammable and combustible liquid isolations shall also comply with ch. COMM 10.

(3) EXCEPTIONS.

(a) 1. A residential clothes dryer having a rated capacity of 37,000 Btu/hour or less may be used within a dwelling unit without providing a fire-resistive rated enclosure.

2. A laundry of not more than 100 square feet that is in a nondwelling unit portion may be either protected with a sprinkler system complying with s. COMM 66.33 (1), or isolated with a 1-hour fire-resistive rated enclosure.

(b) A furnace and water heater serving a single dwelling unit, when located within that unit, may be used without a fire-resistive rated enclosure.

If the venting for an individual living unit must pass through another dwelling unit , then appropriate protection shall be provided (i.e., fire resistive chase, and/or fire dampers or other protection appropriate to the penetration). See COMM 66.32(5) for more information.

(4) CLEARANCE TO COMBUSTIBLES AND COMBUSTIBLE CONSTRUCTION.

(a) Heating equipment shall be installed in accordance with the manufacturer's recommendations to provide minimum clearance. In the absence of manufacturer's recommendations, a minimum clearance of 36 inches shall be provided.

(b) Existing installations providing less than 36 inches of clearance will be accepted if there is no physical evidence of fire hazard, such as charring.

(c) New combustible construction, such as partitions, shelving, or storage lockers, may not encroach upon the required clearance.

COMM 66.475 PROTECTION OF OPENINGS.

All openings in rated enclosures and separations, except for corridors covered in s. COMM 66.37 and garages covered in s. COMM 66.32 (4) (b), shall be protected by labeled, self-closing fire-door assemblies in accordance with Table 66.475.

TABLE 66.475
MINIMUM FIRE-RESISTIVE RATINGS OF DOOR ASSEMBLIES

Fire-Resistive Rating of a Wall or Wall Assembly	Fire-Resistive Rating of Door Assembly
4-Hour	3-Hour A
3-Hour	2-Hour A
2-Hour	1 1/2-Hour B
1-Hour	3/4-Hour C
3/4-Hour	3/4-Hour C
1/2-Hour	1/3-Hour C

* The letter A, B, or C following the hourly rating designates the location for which the assembly is designed, which is intended to agree with NFPA Standard 80. Compliance with the hourly rating is required regardless of the letter designation.

COMM 66.48 STANDPIPES.

Wet or dry standpipes with a minimum capacity of 200 gallons per minute shall be provided in the following buildings:

(1) Any building without 2-hour fire resistance or the sprinkler protection specified in s. COMM 66.33 (1), and that has 3 or more floor levels above the fire-access grade.

(2) Any building with 2-hour fire resistance or the sprinkler protection specified in s. COMM 66.33 (1), and that has 5 or 6 floor levels above the fire-access grade.

COMM 66.48 Fire Access Grade: *The lowest fire access grade floor level is the floor level at or within 6 feet above the grade of the fire department access road.*

COMM 66.48 Standpipes: *As per COMM 51.21 which is applicable to COMM 66, standpipes must be in any enclosed stairway. If the code allows stairways to be open, then no standpipe is required.*

COMM 66.49 SMOKE DETECTION.

(1) All buildings within the scope of this chapter shall be provided with approved smoke detectors as specified in this section.

(2) A smoke detector shall be provided at all of the following locations:

(a) In the basement.

(b) At the head of every open stairway.

(c) 1. At the door on each floor level leading to every enclosed stairway, except as provided in subds. 2. or 3.

2. A rate-of-rise heat detection or other smoke or fire detection device that is not activated by vehicle exhaust shall be used at these doors in an attached garage for a building containing a fire alarm system, and that device shall be installed and maintained in accordance with subs. (3) and (4).

Note: A rate-of-rise heat detection device is not a smoke detector.

2. In a building without a fire alarm system, or in a building with a basement garage, a smoke detector shall be placed on the stair side of the door to the garage.

For at-grade, individual garages (directly accessed by the dwelling unit from the unit's own stair), there is no requirement for a smoke detector at the door leading to the living unit). The smoke detection requirements for garages and stairs apply only to enclosed stairs (see COMM 66.41) and not to unenclosed stairs located within dwelling units.

(d) Either in each sleeping area of each dwelling unit, or elsewhere in the unit within 6 feet from the doorway of each sleeping area but not within a kitchen.

COMM 66.49 Interconnected Smoke Detection: *Interconnected smoke detection in the corridors is* ***not*** *required per this section. Detectors are required in the basement, at the head of every open stair, at the door on each floor level leading to every enclosed stair,* ***and*** *either in each sleeping area or within 6 feet from the doorway to each sleeping area (but not within a kitchen). Note all detectors except those in the living units are required to be interconnected to a manual fire alarm system if one is required per COMM 66.50 where the building is more than 3 stories or contains more than 10 bedrooms.*

COMM 66.49 QUESTION: *The code says smoke detectors shall be on a proper unswitched circuit and shall be provided with a back-up power source. What is acceptable as a back-up power source?*

ANSWER: *Typically, battery back-up detectors are most commonly used. In larger buildings where there is an emergency generator, that may be used to provide the back-up power source if appropriately installed as per COMM 16, NEC, etc.*

(3) (a) All smoke detectors shall be directly and permanently wired to a proper unswitched circuit and be provided with a backup power source.

(b) Where an emergency electrical power system is installed, detectors in stairways, corridors, and other public places shall be connected to it.

(c) All detectors except those located within individual dwelling units shall be electrically interconnected to any required manual fire alarm system. All detectors that are electrically interconnected to the manual fire alarm system shall be latching-type system detectors intended for use with a control panel and shall utilize a supervised circuit.

(4) Smoke detectors shall be installed and maintained in accordance with s. 101.145 (3), Stats.

Note: Section 101.145 (3), Stats., reads: "The owner of a residential building shall install any smoke detector required under this section according to the directions and specifications of the manufacturer of the smoke detector and maintain any smoke detector which is located in a common area of that residential building. The occupant of a unit in a residential building shall maintain any smoke detector in that unit, except that if an occupant who is not an owner, or a state, county, city, village or town officer, agent or employe charged under statute or municipal ordinance with powers or duties involving inspection of real or personal property, gives written notice to the owner that a smoke detector in the unit is not functional the owner shall provide, within 5 days after receipt of that notice, any maintenance necessary to make that smoke detector functional."

COMM 66.50 FIRE ALARMS.

(1) GENERAL. Except as provided in sub. (2), every building which is 3 to 6 stories in height or which contains more than 10 bedrooms shall be provided with a manual fire alarm system as specified in this section.

(a) 1. All alarm systems required by this section shall consist of operating stations on each floor of the building, including the basement, with bells, horns, or other approved sounding devices connected to the system. An audible sounding device shall be provided in every dwelling unit and shall have a minimum rating of 85 decibels at 10 feet away. Fire alarms shall be audible throughout the nondwelling unit portions and be readily distinguishable from any other signalling devices used in the building. A system designed for fire alarm and paging service may be used if the design is such that fire alarm signals will have precedence over all others.

2. In all buildings where a fire alarm system and an automatic fire sprinkler system are installed, a water flow detecting device shall be provided to actuate the fire alarm system.

(b) Every fire alarm system shall be electrically operated on closed circuit current under constant electrical supervision, so arranged that upon a circuit opening and remaining open, or in case of a ground or short circuit in the ungrounded conductor, audible trouble signals will be given instantly. Means shall be provided for testing purposes, and a backup power source shall be provided.

(c) Except as provided in par. (d) and sub. (2), operating stations shall be located in an accessible position at all required exit doors, entrances to exit stairways, and on each floor level at the normal exit therefrom. Operating stations shall be of an approved type and shall be conspicuously identified. All operating stations shall be of a type that, after being operated, will indicate an alarm has been sent therefrom until reset by an authorized means. Operating stations having a "Break Glass" panel will be acceptable. On systems having a device to permanently record the transmission of an alarm, "Open Door" type stations may be used. The fire alarm operating stations shall be mounted between 3 and 4 feet above the finished floor, as measured from the floor to the center of the box.

(d) Manual pull stations are not required within individual dwelling units, except a dwelling unit which is above or below another dwelling unit and which contains a primary exit shall have one pull station, located at that exit.

(e) All alarm systems shall be tested at least once a month, and a record of the tests shall be kept.

(f) All fire alarm systems, whether required by this chapter or not, shall be maintained in an operable condition.

(2) EXEMPTION. Rowhouses, townhouses, and single-story buildings in which each dwelling unit has a primary swinging exit door at grade level are exempt from the provisions of sub. (1).

COMM 66.50 Fire Alarms: *Manual fire alarm pull stations are* ***not*** *required at secondary exits from individual dwelling units(directly to the outside). However, pull stations continue to be required at exit accesses (e.g., the 2nd floor corridor door to the enclosed common stair) and at all required exits in common areas of the building. The following pages contain some examples of how fire alarm pull stations would be required to be placed under the requirements of this code section.*

COMM 66.50 QUESTION: *When all my apartment units have their own exits leading directly outside, must each exit door have its own manual fire alarm pull station?*

ANSWER: *No, if all of the units are rowhouses, townhouses or similar units with a habitable floor level at the first story exit discharge grade.*

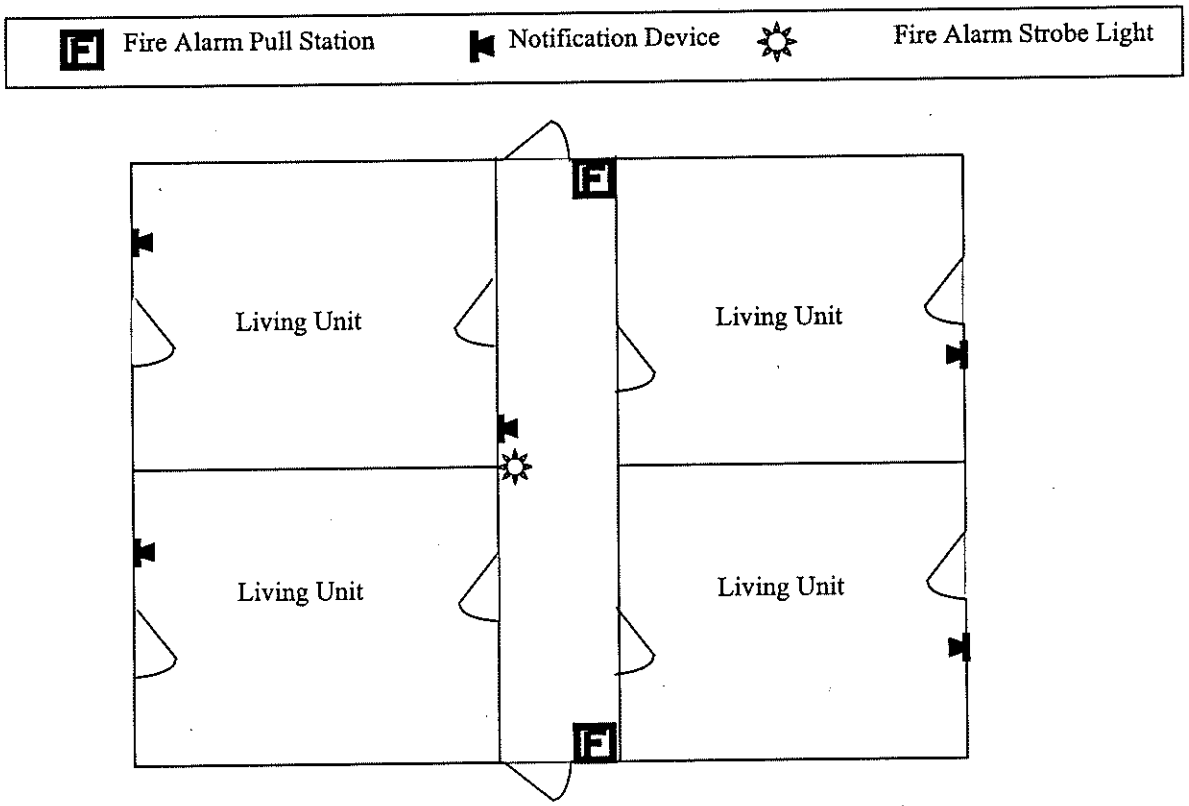
Fire Alarm Requirements in Multifamily Occupancies

There has been some recent confusion regarding the placement of fire alarm pull stations at exits, in multi-family residential occupancies. Section Comm 66.50(1)(c) generally requires pull stations to be located at all required exits of multi-family dwellings. Section Comm 66.50(1)(d) then exempts exits that are within living units, with one exception. A pull station is required at a **primary** exit located within a living unit, if there is another living unit above or below that living unit.

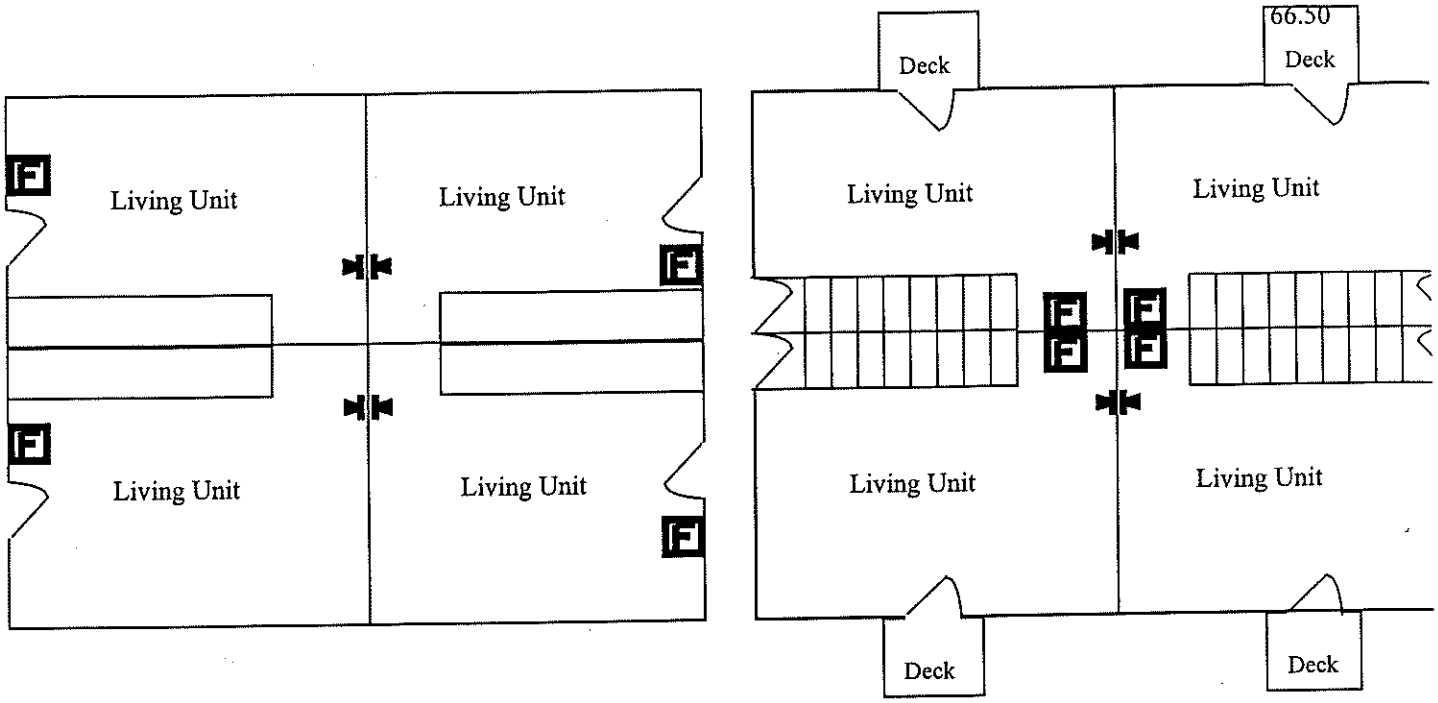
Thus, s. Comm 66.50 eliminated the requirement for pull stations at all rescue platforms and some private ("separate") exits. A private exit would need a pull station if is the living unit's only, or primary exit and there is another living unit above or below that living unit. Pull stations are also still required at any common ("shared") exits. (See diagrams). Note that a fire alarm system is required in Ch. Comm 66 buildings that contain more than 10 bedrooms or that are three stories or more in height.

The diagrams also point out that notification devisies are required within living units in Ch. Comm 66 occupancies per s. Comm 66.50(1)(a)1., as well as in the common areas. In addition, the fire alarm annunciators in common use areas shall include strobe lights per s. Comm 57.82 & .s. ADAAG 4.28.3.

There is no change in the requirement of s. Comm 51.24 for pull stations to be located at all required exits of other occupancies, including rescue platforms of Ch. 57 occupancies such as hotels, motels and CBRFs.

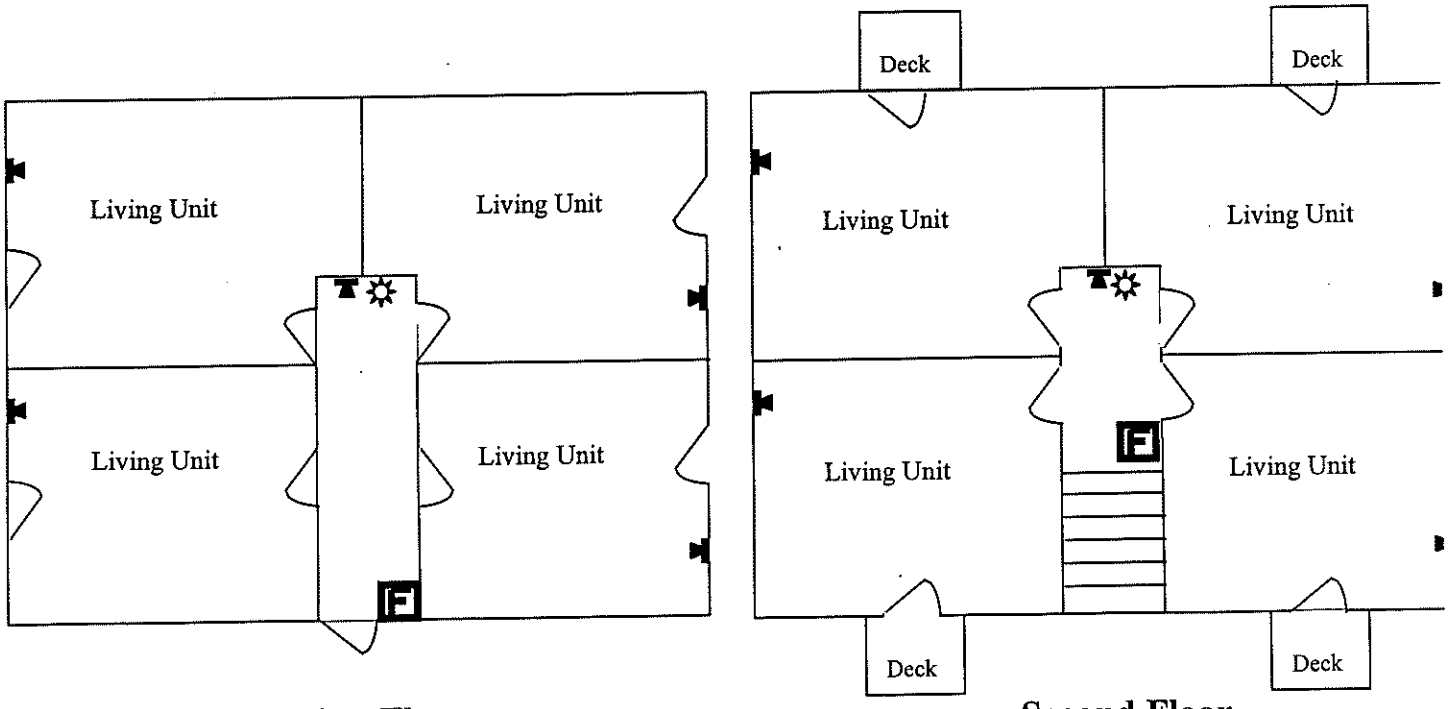


Living Units Not Stacked or Living Units With Common Required Exits per 66.34(1)(a)1.



First Floor **Second Floor**

Stacked Living Units With Separate Primary Exits per 66.34(1)(a)2.



First Floor **Second Floor**

Stacked Living Units With Common & Separate Exits per 66.34(1)(a)4.

COMM 66.51 FIRE EXTINGUISHERS.

Portable fire extinguishers shall be provided in all hazardous areas that are outside of dwelling units. Hazardous areas are building areas containing heat-producing equipment, and building areas that pose a degree of hazard which is greater than normally associated with a residence, such as areas for storing or using combustible, flammable, toxic, noxious, or corrosive materials. All portable fire extinguishers that are provided, whether required by this chapter or not, shall be provided and maintained in accordance with NFPA 10, as adopted by reference in s. COMM 51.25.

COMM 66.51 QUESTION: *Is it required to have fire extinguishers in common areas of my apartment building?*

ANSWER: *It is not a requirement of this code that fire extinguishers be provided in common areas. However, owners may still wish to provide the fire extinguishers. The code does require fire extinguishers in* ***hazardous areas*** *(which, according to COMM 66.47, would include public laundries, storage areas, mechanical rooms, and trash collection or recycling storage rooms).*

Subchapter III — Construction standards and definitions

COMM 66.60 CONSTRUCTION STANDARDS AND DEFINITIONS.

The design and construction of multifamily dwellings shall comply with the applicable requirements of chapters COMM 51 to 53, subchapter II of COMM 57, and chapters COMM 63, 64, and 69, which are hereby incorporated by reference into this chapter.

Note: A longer-term goal of the department is to place these applicable requirements in an appendix to this code.

COMM 66.60 Adoption of COMM 52.012 (3): *While COMM 52 is adopted in its entirety, COMM 52.012 (3) does not specifically include COMM 66 occupancies as requiring sprinklering or protection for storage areas (COMM 57 occupancies still require this protection). COMM 66.47 requires isolation of hazards for combustible storage in public areas. Designers should still be aware that any storage areas within the dwelling unit may require some evaluation. For example, unless the dwelling unit membrane is continued through the attic space, it would be inappropriate for the tenant to utilize this space for any storage. Further, items such as trash and combustibles are subject to the requirements of COMM 66.47 (Isolation of Hazards).*

COMM 66.60 COMM 57, Subchapter II Accessibility: *These state "fair housing" requirements apply to* ***residential tenant only*** *areas of an COMM 66 occupancy (note COMM 57 adopts certain ADAAG provisions in common areas). If there are areas into which the public might come, such as attached office tenant occupancies, a restaurant serving the public as well as tenants, etc), they will be subject to the more restrictive requirements of COMM 69/ADAAG.*

COMM 66.60 Construction Standards and Definitions. *The design and construction of multifamily dwellings shall comply with the applicable requirements of Chapters COMM 51 to 53, Subchapter II of COMM 57, and Chapters COMM 63, 64, and 69, which are hereby incorporated by reference into this chapter.*

Requirements of the current edition of the referenced chapters are applicable unless COMM 66 specifically addresses the issue. Note that all of the COMM 50 requirements have been replaced by COMM 66 requirements. See the following table for applicable requirements.

Subchapter IV — Electrical standards

COMM 66.61 ELECTRICAL STANDARDS.

All electrical wiring, installations, equipment, and materials used in the construction of multifamily dwellings shall comply with the requirements of the Wisconsin administrative electrical code, vol. 2., ch. COMM 16, which is hereby incorporated by reference into this chapter.

COMM 66.61 Electrical Code: *This section adopts COMM 16/NEC Electrical Code requirements. Electricians and designers who previously utilized Exception No. 8 under COMM 16.25 (1)(c) to allow a service drop or lateral to serve two units (the COMM 57 "rowhouse" exception) can again use this exception (effective with the July 1, 1996, code change package).*

Our electrical code consultants warn us that a common field problem is isolation of 1-hour fire-resistive assemblies with electric box placements. Designers and supervising professionals need to remember that mechanical components such as electrical receptacle boxes must be installed in accordance with the listed assembly.

A second common problem is failure to properly seal around mechanical penetrations of fire-resistive assemblies. Supervising professionals need to be especially alert to this during periodic site visits to observe and monitor their projects.

Subchapter V — Plumbing

COMM 66.62 PLUMBING.

The design, construction, and installation of plumbing shall comply with the requirements of the Wisconsin administrative plumbing code, chs. COMM 81 to 86, which is hereby incorporated by reference into this chapter.

Requirements of this section are applicable to COMM 66 buildings.		Requirements of the referenced chapters are not applicable and are replaced by:
Chapter COMM 51		
DEFINITIONS AND STANDARDS		
COMM 51.01	Definitions	Supplemented by COMM 66.03
~~COMM 51.015~~	~~Scope~~	COMM 66.02
COMM 51.02	General requirements	COMM 51.02 (19) changed by COMM 66.33 (3) COMM 51.02 (11) replaced by COMM 66.41
COMM 51.03	Classes of construction standards	Partially changed by COMM 66.32
Fire-Resistive Standards for Materials of Construction		
COMM 51.04	Scope	
COMM 51.042	General requirements	
COMM 51.043	Approved rating methods	
COMM 51.044	Testing laboratories	
COMM 51.045	Typical examples of fire-resistive structural components	
COMM 51.046	Calculation method	
COMM 51.047	Fire-rated door assemblies in fire-rated construction	
COMM 51.048	Fire window and glass block assemblies in fire-rated construction	
COMM 51.049	Miscellaneous openings in fire-rated construction	COMM 66.32 (5)
COMM 51.05	Roof coverings	
COMM 51.06	Foam plastics	
COMM 51.065	Light-transmitting plastics	
COMM 51.07	Interior finishes	
COMM 51.08	Occupancy separations	Modified by COMM 66.33 (2)(c)
COMM 51.14	Safety glazing	
COMM 51.15	Standard exit	Modified by COMM 66.37, 66.42, 66.43

COMM 51.151	Exit distribution	
COMM 51.152	Egress configuration	
~~COMM 51.16~~	~~Stairways and ramps~~	COMM 66.38
~~COMM 51.161~~	~~Handrails~~	COMM 66.40
~~COMM 51.162~~	~~Guardrails~~	COMM 66.40
~~COMM 51.164~~	~~Headroom~~	COMM 66.465
COMM 51.165	Stairway identification	
COMM 51.166	Stairway discharge	
COMM 51.167	Exiting through areas of hazard	Modified by COMM 66.34 (1)(b)
COMM 51.17	Smokeproof stair tower	
COMM 51.18	Interior enclosed stairway	
COMM 51.19	Horizontal exit	
COMM 51.20	Fire escapes	
COMM 51.21	Standpipe and hose systems	COMM 66.50
COMM 51.22	Fire extinguishers	COMM 66.49
COMM 51.23	Automatic sprinklers	
COMM 51.24	Fire alarm systems	
COMM 51.245	Smoke detectors	
COMM 51.25	Incorporation of standards by reference	
		COMM 66.47
All of COMM 52 except COMM 52.012 (3) - Storage areas		
All of COMM 53		
All of COMM 57, Subchapter 2		
All of COMM 63 Note COMM 63.01 references COMM 50.12. For the purposes of this code, reference COMM 66.06 and COMM 66.14		
All of COMM 64 Note COMM 64.02 references COMM 50.07 and COMM 50.12. For purposes of this code, reference COMM 66.06 and COMM 66.14		

All of COMM 69 for building portions that are for use by the true general public, (guests of a tenant are not "general public").	

NOTE: We are aware of certain instances (i.e., COMM 52.07 (6) and (7)) where COMM 50-64 was not updated to properly reference COMM 66. These will be corrected in future code updates as they are identified. In the meantime, where a code issue is being incorporated into an COMM 66 occupancy and COMM 66 does not specifically address the issue, the issue will be addressed by applying the COMM 57 criteria.

APPENDIX A

The material contained in this appendix is for clarification purposes only and is numbered to correspond to the number of the rule as it appears in the text of the code.

A-66.04(1)(e) Lower threshholds for municipalities with preexisting stricter sprinkler ordinances. Section 101.14(4m)(d) and (e), Stats, provides the following threshholds above which fire sprinkler protection 2-hour fire-resistance can be required by a municipality with a preexisting stricter sprinker ordinance.

Class of Construction	Total Floor Area Within Individual Dwelling Units	Number of Units	Total Floor Area of Nondwelling Unit Portions (Common use areas, such as corridors, stairways, basements, cellars, vestibules, community rooms, laundry rooms, pools, etc.)
Type 1 Fire Resistive Type A	8,000 sq ft	8 units	12,000 sq ft
Type 2 Fire Resistive Type B			10,000 sq ft
Type 3 Metal Frame Protected			8,000 sq ft
Type 4 Heavy Timber Type 5A Masonry Protected Type 5B Masonry Unprotected Type 6 Metal Frame Unprotected Type 7 Wood Frame Protected			5,600 sq ft
Type 8 Wood Frame Unprotected			4,800 sq ft

The department, based on ordinances forwarded by municipalities (and checked by Safety and Buildings staff for conformance with the preexisting sprinkler ordinance criteria) believes that that following municipalities have preexisting stricter sprinkler ordinances:

City of Appleton
City of Brookfield
City of Franklin
Village of Germantown
Village of Greendale
City of Greenfield
City of Madison
Village of Menomonee Falls
City of Monona
City of Muskego
City of New Berlin
City of Oak Creek
City of Racine
Village of Shorewood Hills
Village of Sussex
City of West Allis
City of West Bend

Municipality	Contact Name	Phone No	Date of Ordinance	Conditions of Ordinance
Appleton, City of 700 N. Drew St. 54911-2927	William Schultz Fire Marshall	(414) 832-5810	1/9/91	Option 1> 3 units and 4,800 sq. ft./floor shall be protected in dwelling units with residential heads, windowless floor levels and storage, option 2 throughout bldg. with NFPA 13
Brookfield, City of 2100 N. Calhoun Rd. 53005-5000	Dennis P. Hibbard	(414) 787-8932	12/86	Requires sprinkler system installed and maintained
Fitchburg, City of 2377 S. Fish Hatchery Rd. 53711	Building Inspection Department		7/15/95	Adopt Section 101.14(4m)(d) and (e), Stats
Franklin, City of 8901 W. Drexel Ave. 53132-9725	Lt. Burton L. Robertson	(414) 425-1420	1978	Require NFPA 13, 13D, 13R & 25 bsmt., stairways, corridors in bldgs. up to 5 stories in ht. (which are fire-resistive) and bsmt., stairways & corridors throughout bldgs. 2 stories or more
Greendale, Village of 6500 Northway P.O. Box 257 53129-0257	W. Scott Satula	(414) 423-2100	8/7/84	3 or more dwelling units which are fire-resistive in bsmt., stairways and corridors. 5 or less stories non-fire-resistive in bsmt., stairways and corridors and throughout greater than 2 stories NFPA 13
Greenfield, City of 4333 S. 92nd St. 53228	Glenn Forrest Asst. Chief	(414) 545-7946	4/17/90	Throughout multifamily per NFPA 13R in fire-resistive and non-fire-resistive, over 4 stories per NFPA 13
Kewaunee, City of 320 Harrison St. 54216	Greg Hlinak Chief	(414) 388-5006		Adopt Section 101.14(4m)(d) and (e), Stats
Madison, City of Madison Municipal Bldg. P.O. Box 2984 53716	Harry Sulzer	(608) 226-4551	7/14/72	Storage areas in bldgs. 20 units or less 2,500 sq. ft. be sprinklered
Menasha, Town of	Donald L. Cox Fire Chief	(414) 729-0931	1982	Contact Town for conditions
Menomonee Falls, Village of W156 N8480 Pilgrim Rd. 53051-3140	William E. Freisleben	(414) 225-8347		Bldgs. greater than 4,000 sq. ft., sprinklers in basements, store rooms, hallways and stairways
Monona, City of 5211 Schluter Rd. 53716	Terry G. Frederickson	(608) 222-2525	Before 1/92	Bldgs. > 2 stories, 8 living units sprinklered throughout bldg. and fast response heads in dwelling units

Mount Pleasant, Town of	Charles Wittug Asst. Chief	(414)554-8660	11/1/84	Contact Town for conditions
Muskego, City of W182 S8200 Racine Ave. 53150	Chuck Dykstra Director of Bldg. Dept.	(414) 679-4110	6/2/90	Throughout all bldgs. exceeding 3 stories which are fire-resistive. Throughout all bldgs. non-fire-resistive
New Berlin, City of 16300 W. National Ave. 53151	Fred Schultz Asst. Chief	(414) 785-6158	12/16/80	All bsmts. and multifamily ≥ 4 units and hotel/motels throughout with NFPA 13R and in common areas
Oak Creek, City of 8640 S. Howell Ave. 53154-2948	Richard F. Holden	(414) 768-6547		Adopt Section 101.14(4m)(d) and (e), Stats w/additional requirements, fire-resistive type 1 & 2 and throughout all bldgs. over 3 stories
Pewaukee, City of W240N3065 Pewaukee Rd. 53072	Kevin I. Bierce Captain Fire Prevention Bureau	(414) 691-9223	7/3/95	Adopt COMM 66.33-B
Racine, City of 810 Eighth St. 53403	George A. Lambert Division Chief Fire Prevention Bureau	(414) 639-7915	3/15/95	Bldgs. > 10,000 sq. ft, bldgs. over 1 story and > 5,000 sq. ft., bldgs. over 2 stories install as per NFPA 13
Shorewood Hills, Village of 1008 Shorewood Blvd. 53705-3140			6/15/90	Residential occupancies as per NFPA 13
Sussex, Village of P.O. Box 249 53089	Thomas J. Wegner	(414) 246-5197	11/25/75	Sprinklers throughout all bldgs. as per NFPA 13
Wauwatosa, City of 1463 Underwood Ave. 53213	Thomas C. Bulin Fire Marshall		5/92	
West Allis, City of 2040 S. 67th Pl. 53219	Frank Zalar	(414) 266-7263	11/6/90	All fire-resistive bldgs. exceeding 10,000 sq. ft or more in total area or is over 1 story in hgt. and greater than 6,000 sq. ft. greater than 2 stories as per NFPA 13 and NFPA 13R in dwelling units, throughout every bldg. which is not divided by a fire wall and greater than 6,000 sq. ft or is greater than 2 stories
West Bend, City of 325 N. Eighth Ave. 53095-3399	Arlyn A. Sarauer Bn. Chief	(414) 335-5054	1984	Requires sprinklers in bldgs. greater than 8,500 sq. ft. of habitable area

Chapter Comm 69

Barrier-Free Design

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Overview of Building Accessibility Regulations
February 1999

General

- Refer to Ch. Comm 69 for commercial occupancies and Ch. Comm 57, Subch. 2 for multi-family occupancies
- **Historic Buildings** - Certain registered historic buildings are allowed by Ch. Comm 70 to meet alternative accessibility requirements contained in Ch. Comm 69.
- **State plan review** is required for new buildings, additions and alterations involving structural strength, fire hazard, exits, required natural light or replacement of major HVAC equipment, other than in factories, office buildings, mercantile buildings and storage garages less than 25,000 cubic feet. Certified municipalities may be able to review smaller projects.
- For further information contact your local building inspector or the State Division of Safety & Buildings at 608-266-3151.

Chapter Comm 69, Barrier-Free Design

- **Scope**
  - Effective December 1, 1994; revised January 1, 1998 and January 1, 1999
  - Applies to commercial occupancies
  - Incorporates and amends federal ADAAG technical guidelines (effective January 26, 1992 for existing buildings, January 26, 1993 for new construction)
- **New buildings** (note that the ADAAG definition of "story" includes basements and groundfloors that have occupiable space)
  - **Must provide accessibile features on all floors, regardless of whether vertical access is required**
  - Elevator access is required to all levels, other than storage mezzanines, in buildings that have either:
    - $\geq$ 3 stories and > 3000 sq ft on any floor
    - transportation, healthcare or shopping mall occupancies
    - government occupancies, other than non-grade floor levels <500 sq ft and 5 person capacity in buildings <3 stories and not open to the general public
  - Elevator, limited-use elevator or platform lift required if > 20,000 sq ft total. Vertical access is not required to a mezzanine if the accessible floor has comparable employment, sleeping room or common-use areas, or to a storage level.
  - Smaller buildings to have access to a primary floor, including areas raised or depressed up to 3 feet. Vertical access would also be required to a floor level with accessible toilets or any employee lunchroom if the primary floor does not have these facilities.
  - Stairs to be accessible per Ch. Comm 69 in all buildings without elevators. All other stairs shall comply with Ch. Comm 51 building code.
- **Additions**
  - **Shall meet current code on all floors of the addition, regardless of whether vertical access is required**
  - Vertical access by elevator or lift is required if the overall building becomes $\geq$ 3 stories and >3000 sq.ft on any floor; or > 20,000 sq ft total.
  - If an addition with a "primary function" does not contain accessible entrances, exits, toilets, drinking facilities, or public telephones, then these elements in the original building which serve the addition need to be brought up to current code unless "disproportionality" shown. (Existing stairs may remain.)
- **Alterations,** other than repairs
  - What you touch must meet current code
  - Also the following items "along the path of travel" serving alterations involving a "primary function" must meet current code, unless "disproportionality" (max 20% of project cost) can be shown: accessible entrances, exits, toilets, drinking facilities, and public telephones. (Existing stairs may remain.)
- **Change of use** does not trigger code, unless physical alterations are also being made
- **Not retroactive** to existing buildings, unless physically altered or added to
- **Change of ownership** does not trigger the code

Notes:

- "Equivalent facilitation" to the code requirements possible by petition
- In new buildings, or additions with stairs, all required, enclosed or exterior exits must be accessible or provided with "areas of rescue assistance" on all floors, other than storage-only floors. This applies whether or not the building is elevatored. Buildings with a supervised and monitored fire sprinkler system are exempt.
- An accessible unisex toilet on each floor may be used if technically infeasible to upgrade existing toilet rooms. It may also be used in factory, office and mercantile occupancies where there are less than 25 customers and 10 employees.
- Individual work stations do not need to be accessible, but able to be approached, entered and exited.
- Mechanical service areas do not need to be accessible.

Federal: In addition to state requirements, federal ADA Title III requires public building owners to conduct a self-evaluation and make "readily achievable" accessibility alterations to their buildings as well as program changes, independent of any planned building alterations. There are tax credits available for certain work. Federal ADA Title II requires government agencies to make their programs accessible. For Titles II & III, contact DOJ at 800-514-0301. Federal Title I requires employers to make "reasonable accomodations" for employees with disabilities. Contact federal EEOC at 800-669-4000.

Chapter Comm 57, Subch. II, Accessibility Standards for Covered Multifamily Housing

- **Scope**
  - Effective May 1, 1994 (emergency rules were effective January 12, 1993)
  - Applies to 3 unit or more, multi-family, non-transient housing (Ch. Comm 66), including apartment buildings, townhouses, rowhouses and multi-unit condominiums
  - Based on federal Fair Housing Amendments (effective March 13, 1991)
  - ADAAG applies to the public & common use areas
- **New construction** - every building must have an accessible grade level floor with dwelling units, unless site impracticality is shown by petition
  - In non-elevatored buildings, 100% of grade-level single-story units
  - All units in elevatored building shall be accessible
  - Exempt are multi-level dwellings units with separate exterior entrances in buildings without elevators
    - If building includes commercial use, then vertical access is required to the lowest floor with dwelling units, regardless of building area
    - All common and public use areas on accessible levels or that are unique must be accessible. Common stairs next to a ramp are required to provide accessibility per Ch. Comm 69 ADAAG on a grade level or on any level in an elevatored building. Areas of rescue assistance are required on accessible floor levels.
- **Alterations**
  - If over 50% remodeled, then the whole building shall comply with current code
  - If 25% to 50% altered, then the altered space shall meet the current code
  - If less than 25% altered, then the altered interior doors, exits, entrances and bathrooms must meet current code
  - If mixed commercial and residential use >20,000 sq. ft., then vertical access is required to the lowest floor with dwelling units
  - Alteration percentages are cumulative since May 1, 1994
- **Change of use** does not trigger code, unless remodeling takes place
- **Not retroactive**
- **Change of ownership** does not trigger the code
- **Note**: An owner may claim "site impracticality" by petition to eliminate accessible entrances for buildings without elevators.

Federal: Note that Federal Fair Housing requirements do not apply to alterations. For further federal information, contact HUD at 202-708-2618.

Chapter Comm 69

BARRIER–FREE DESIGN

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Comm 69.17 Accessible elements and spaces: scope and technical requirements [ADAAG 4.1.2].
Comm 69.18 Accessible buildings: new construction requirements [ADAAG 4.1.3].
Comm 69.19 Accessible building: additions [ADAAG 4.1.5].
Comm 69.20 Accessible buildings: alterations [ADAAG 4.1.6].
Comm 69.21 Accessible buildings: historic [ADAAG 4.1.7].
Comm 69.22 Wheelchair passage width [ADAAG 4.2.1].
Comm 69.23 Accessible route [ADAAG 4.3].
Comm 69.24 Protruding objects [ADAAG 4.4.1].
Comm 69.245 Parking spaces [ADAAG 4.6.3].
Comm 69.25 Curb ramps [ADAAG 4.7].
Comm 69.26 Ramps [ADAAG 4.8].
Comm 69.27 Stairs [ADAAG 4.9].
Comm 69.275 Elevators [ADAAG 4.10].
Comm 69.28 Platform lifts [ADAAG 4.11].
Comm 69.29 Doors [ADAAG 4.13].
Comm 69.30 Toilet stalls [ADAAG 4.17].
Comm 69.32 Faucets [ADAAG 4.19.5].
Comm 69.34 Shower stalls [ADAAG 4.21].
Comm 69.35 Toilet rooms, clear floor space [ADAAG 4.22.3].
Comm 69.36 Size and spacing of grab bars and handrails [ADAAG 4.26.2].
Comm 69.37 Detectable warnings on walking surfaces [ADAAG 4.29.2].
Comm 69.375 Assembly seating [ADAAG 4.33.3].
Comm 69.39 Dressing and fitting rooms [ADAAG 4.35].
Comm 69.40 Restaurants and cafeterias [ADAAG 5.0].
Comm 69.41 Medical care facilities [ADAAG 6.0].
Comm 69.415 General [ADAAG 7.1].
Comm 69.42 Accessible transient lodging [ADAAG 9.0].
Comm 69.45 General.
Comm 69.46 General.
Comm 69.47 Entrances.
Comm 69.48 Residential cells or rooms: minimum number.
Comm 69.49 Requirements for accessible residential cells or rooms.
Comm 69.50 Visual alarms and telephones.

Note: Chapter ILHR 69 was renumbered to be chapter Comm 69 under s. 13.93 (2m) (b) 1. and corrections were made under s. 13.93 (2m) (b) 7., Stats., Register, December, 1997, No. 504. **Corrections made under s. 13.93 (2m) (b) 7., Stats., Register, December, 1998, No. 516.**

Subchapter I — Administration and Enforcement

Part 1 – Purpose and scope

Comm 69.01 Purpose. The purpose of this chapter is to insure that any building or facility is designed, constructed, and altered to be accessible and usable by people with disabilities.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.02 Scope. Except as specified in s. Comm 69.04, this chapter applies to all buildings and facilities. The requirements of this chapter are not retroactive unless specifically stated in the administrative rule. Where different sections of this chapter specify different requirements, the most restrictive requirement shall govern. This chapter is not intended to prohibit or discourage the design and construction of innovative buildings or the use of new materials or systems provided written approval from the department is obtained. Under this chapter, written approval from the department shall include, but is not limited to, an acceptance through preliminary design consultation, plan review, petition for variance, official code interpretation, material approval or other forms of written communication.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Part 2 – Application of code

Comm 69.03 Application. (1) NEW CONSTRUCTION AND ADDITIONS. All new construction and additions shall comply with this chapter.

(2) ALTERATIONS TO BUILDINGS. Any remodeling or alterations, or both, in a building or facility which affects or could affect the usability of or access to a building or facility by a person with a disability shall comply with this chapter.

(3) CHANGE OF USE. The requirements of this chapter shall be applied when the use of an existing building or facility is changed and the building or facility is altered or remodeled in accordance with s. Comm 69.20 and ADAAG 4.1.6.

Note: The federal Americans with Disabilities Act (ADA) requires public accommodations to remove architectural barriers in existing buildings where the removal of such barriers is readily achievable. See 28 CFR Part s. 36.304.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. (3), Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.04 Buildings exempt from the code requirements. This chapter does not apply to buildings specified in s. Comm 50.04.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.045 Maintenance of facilities. Any building, facility or site which is constructed or altered to be accessible under this chapter shall be maintained accessible during its occupancy.

History: Cr. Register, December, 1997, No. 504, eff. 1–1–98.

Part 3 – Design and supervision

Comm 69.05 Design and supervision. The design and construction supervision of a building or facility shall comply with ss. Comm 50.07 to 50.11.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Part 4 – Departmental action

Comm 69.06 Plan examination and department action. (1) ALL BUILDINGS. The accessibility requirements of this chapter shall be presented as part of the general plan submittals required under s. Comm 50.12 (2) and (3). The requirements of ss. Comm 50.12, 50.13 to 50.175, 50.18 (1) and 50.20 shall be complied with where applicable to the project.

(2) ADDITIONS AND ALTERATIONS. Plans and specifications showing compliance with this chapter and the primary path of travel to the added or altered area shall be submitted to the department or its authorized representative for department action.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; am. (1), Register, December, 1997, No. 504, eff. 1–1–98.

Part 5 – Enforcement, appeals, petitions for variance and penalties

Comm 69.07 Enforcement. This chapter shall be enforced by the department or by municipal officials or other local officials who are required by law to enforce the administrative rules of the department. The department shall have the responsibility for interpreting the rules in this chapter, including the Americans with Disabilities Act Accessibility Guidelines (ADAAG) incorporated as department standards.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.08 Appeals. Any person affected by any local order which is in conflict with a rule of the department may petition the department for a hearing on the grounds that the local order is unreasonable and in conflict with the rule of the department. The department shall review and make a determination on an appeal of a local ordinance within 60 business days of receipt of a verified petition submitted with all forms, fees, plans and documents required to complete the review.

Note: Section 101.01 (1) (g), Stats., defines "local order" as any ordinance, order, rule or determination of any common council, board of alders, board of trustees or the village board, of any village or city, or the board of health of any municipality, or an order or direction of any official of such municipality, upon any matter over which the department has jurisdiction.

Note: This chapter does not invalidate or limit the remedies, rights and procedures of federal laws, or local laws that provide greater or equal protection for the rights of individuals with disabilities or individuals associated with them.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.09 Penalties. Penalties for violations to this chapter shall be assessed in accordance with s. 101.02 (13) (a), Stats.

Note: Section 101.02 (13) (a), Stats., indicates penalties will be assessed against any employer, employe, owner or other person who fails or refuses to perform any duty lawfully enjoined, within the time prescribed by the department, for which no penalty has been specifically provided, or who fails, neglects or refuses to comply with any lawful order made by the department, or any judgment or decree made by any court in connection with ss. 101.01 to 101.25, Stats. For each such violation, failure or refusal, such employe, owner or other person must forfeit and pay into the state treasury a sum not less than $10 nor more than $100 for each violation.

Note: Section 101.02 (12), Stats., indicates that every day during which any person, persons, corporation or any officer, agent or employe thereof, fails to observe and comply with an order of the department will constitute a separate and distinct violation of such order.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.10 Petitions for variance. (1) PROCEDURE. The department shall consider and may grant a variance to an administrative rule under this chapter upon receipt of a fee, a completed petition for variance form from the owner, and a position statement from the fire department and the certified municipality having responsibility and an interest in the rule, provided an equivalency is established in the petition for variance which meets the intent of the rule being petitioned. The department may impose specific conditions in a petition for variance to promote the protection of the health, safety or welfare of the employes or the public. Violation of those conditions under which the petition is granted constitutes a violation of these rules.

(2) PETITION PROCESSING TIME. Except for priority petitions, the department shall review and make a determination on a petition for variance within 30 business days of receipt of all calculations, documents and fees required to complete the review. The department shall process priority petitions within 10 business days.

Note: Copies of the department petition for variance form SBD 9890 are available from the Division of Safety and Buildings, P.O. Box 7162, Madison, Wisconsin 53707.

(3) DISPROPORTIONALITY IN ALTERED BUILDINGS. When providing a path of travel to an altered area is considered disproportionate, an SBD–10219 form shall be included with the alteration plans submitted for review. The disproportionate costs shall be determined in accordance with the following:

(a) *Disproportional cost.* 1. Alterations made to provide an accessible path of travel to the altered area shall be deemed disproportionate to the overall alteration when the cost exceeds 20% of the cost of the alteration to the primary function area.

2. Costs that may be counted as expenditures required to provide an accessible path of travel may include:

a. Costs associated with providing an accessible entrance and an accessible route to the altered area;

b. Costs associated with making toilet rooms accessible, such as installing grab bars, enlarging toilet stalls, insulating pipes or installing accessible faucet controls;

c. Costs associated with providing accessible telephones, such as relocating the telephone to an accessible height, installing amplification devices or installing a telecommunications device for deaf persons (TDD);

d. Costs associated with relocating an inaccessible drinking fountain.

Note: Copies of the department disproportionality form SBD–10219 are available from the Division of Safety and Buildings, P.O. Box 7162, Madison, Wisconsin 53707.

(b) *Duty to provide accessible features in the event of disproportionality.* 1. When the cost of alterations necessary to make the path of travel to the altered area fully accessible is disproportionate to the cost of the overall alteration, the path of travel shall be made accessible to the extent that it can be made accessible without incurring disproportionate costs.

2. In choosing which accessible elements to provide, priority shall be given to those elements that will provide the greatest access, in the following order:

a. An accessible entrance;

b. An accessible route to the altered area;

c. At least one accessible toilet room for each sex or a single unisex toilet;

d. Accessible telephones;

e. Accessible drinking fountains; and

f. Accessible elements such as parking, storage and alarms.

(c) *Series of alterations.* 1. The obligation to provide an accessible path of travel may not be evaded by performing a series of alterations to the area served by a single path of travel if those alterations could have been performed as a single undertaking.

2. If an area containing a primary function has been altered without providing an accessible path of travel to that area and subsequent alterations of that area, or a different area on the same path of travel, are undertaken within the three years of the original alteration after the effective date of this rule, the total cost of alterations to the primary function areas on that path of travel during the preceding three year period shall be considered in determining whether the cost of making that path of travel accessible is disproportionate.

3. Only alterations undertaken after December 1, 1994, shall be considered in determining if the cost of providing an accessible path of travel is disproportionate to the overall cost of the alterations.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. (3) (intro.), Register, December, 1997, No. 504, eff. 1–1–98.

Part 6 – Adoption of Standards

Comm 69.105 Adoption of standards. (1) CONSENT TO INCORPORATE. Pursuant to s. 227.21, Stats., the attorney general and the revisor of statutes have consented to the incorporation by reference of standards listed in sub. (4).

(2) COPIES. Copies of the adopted standards are on file in the offices of the department, the secretary of state and the revisor of statutes. Copies of the standards may be purchased through the organization listed in sub. (4).

(3) INTERIM AMENDMENTS. Interim amendments of ANSI A156.10–1991 and A156.19–1990 will have no effect in this state until such time as this chapter is correspondingly revised to reflect those changes.

(4) ADOPTION AND AVAILABILITY OF STANDARDS. The following standards are hereby incorporated by reference into this chapter.

(a) The American National Standards Institute (ANSI) A156.10–1991, Power–operated pedestrian doors.

(b) The ANSI A156.19–1990, Power–assist and low–energy, power–operated doors.

Note: Copies of the ANSI A156.10 and A156.19 standards may be obtained from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036.

History: Cr. Register, December, 1997, No. 504, eff. 1–1–98.

Subchapter II — Standards for New Construction, Additions and Alterations

Part 1 – ADAAG standards

Comm 69.11 Standards for new construction, additions and alterations. (1) ADAAG STANDARDS. Any new construction, addition and alteration subject to this chapter shall comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG), as printed in Part III of the July 26, 1991 Federal Register and in the September 6, 1991 Federal Register and as corrected in the January 14, 1992 Federal Register, subject to the changes, additions and omissions specified in ss. Comm 69.12 to 69.50.

Note: A reprint of the ADAAG standards is included in Appendix B.

Note: The federal Americans with Disabilities Act (ADA) is a federal law applying to public accommodations and public entities. The ADA law does not preempt the state building code requirements, so an owner is responsible for compliance with the most restrictive requirements from both the federal and state regulations.

Note: Copies of the complete ADA law, preamble and ADAAG standards can be obtained from the Great Lakes Disability and Business Technical Assistance Center, University of Illinois, 1640 West Roosevelt Road, Chicago, Illinois 60608, or New Orders, Superintendent of Documents, P.O. Box 371954, Pittsburgh, Pennsylvania 15250–7954.

(2) DEPARTMENT AUTHORITY. The department shall have the authority and responsibility for interpreting this chapter and the ADAAG standards as reprinted in appendix B. Any changes to the federal ADAAG standards shall not affect the requirements in this chapter until such time as this chapter is correspondingly revised to adopt those changes. A formal interpretation of this chapter shall remain in effect until rescinded or changed or until the code is changed to reflect the new standards.

Note: An owner of a building or facility must comply with all applicable federal, state and local requirements. If the federal ADAAG standards are changed, an owner must comply with those changes at the federal level, even if they are not reflected in this chapter or enforced by the department or its local agents.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. (2), Register, December, 1997, No. 504, eff. 1–1–98.

Part 2 – Changes or additions to or omissions from the ADAAG standards

Comm 69.12 Changes or additions to or omissions from the ADAAG. Changes or additions to or omissions from the ADAAG standards are specified in this chapter and are rules of the department and are not requirements of the ADAAG standards.

Note: The referenced ADAAG section or rule number, located in the brackets, follows the Comm designation and precedes the text of the rule.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Subpart 1 – Purpose

Comm 69.13 Purpose [ADAAG 1.0]. Substitute the following wording for the first paragraph of ADAAG 1.0: This chapter sets minimum standards for accessibility to a building or facility by an individual with a disability. The requirements of this chapter are to be applied during the design, construction, alteration and occupancy of such a building or facility.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Subpart 2 – General

Comm 69.14 Equivalent facilitation [ADAAG 2.2]. Substitute the following wording for ADAAG 2.2: Departures from particular technical and scoping requirements of this chapter by the use of other designs and technologies are permitted where the alternative designs and technologies used will provide substantially equivalent or greater access to and usability of the building or facility. A petition for variance shall be submitted in accordance with s. Comm 69.10 for alternative designs and technologies.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Subpart 3 – Miscellaneous instructions and definitions.

Comm 69.15 Miscellaneous instructions and definitions [ADAAG 3.0]. For the purposes of this chapter the following words and terms are defined as:

(1) DEFINITIONS [ADAAG 3.5]. Substitute the following definitions for these definitions found in ADAAG 3.5:

(a) "Access or accessible" means the physical characteristics of a place which allow persons with a functional limitation caused by impairments of sight, hearing, coordination or perception or persons with semiambulatory or nonambulatory disabilities to enter, circulate within and leave a place of employment or public building and to use the public toilet facilities and passenger elevators in the place of employment or public building without assistance.

(b) "Alteration" means a change to a building or facility that affects or could affect the usability of a building or facility or part thereof. An alteration includes, but is not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, changes or rearrangement of the structural parts or elements, and a change or rearrangement in the plan configuration of walls and fixed partitions. Normal maintenance, reroofing, painting or wallpapering, or changes to mechanical and electrical systems are not alterations unless they affect the usability of the building or facility.

(c) "Building" means any structure intended for supporting or sheltering any use or occupancy, including a public building, place of employment, public accommodation, commercial facility, public entity, private entity, private club and a religious organization.

(d) "Facility" means any portion of a building, structure, site improvement, complex, walk, passageway, or parking lot located on a site.

(2) DEFINITIONS [ADAAG 3.5]. These are department definitions in addition to the requirements of ADAAG 3.5:

(a) "Appropriate local authority" means the department of industry, labor and human relations or its authorized representative.

(am) "Baptistery" means the area of the church used for baptism.

(ar) "Chancel" means the part of the place of worship containing the altar and seats for the clergy.

(b) "Complying or complies with local requirements" means conforming with any administrative code enforced by this department.

(c) "Disability" means a physical or mental impairment that substantially limits one or more major life activities, a record of having such an impairment or being regarded as having such an impairment.

(cm) "Exit" has the meaning given in s. Comm 51.01 (36a).

Note: Comm 51.01 (36a) reads "exit means that portion of a means of egress which is separated from all other spaces of the building or structure by construction providing a protected way of travel to the exit discharge."

(d) "Fixed partition" means any equipment or divider which serves the same purpose as a full or partial height wall and requiring tools to assemble or disassemble.

(e) "Handgrip portion" means the grasping surface of a handrail to the point where the thumb and fingers curl around and under the rail.

(f) "Path of travel" includes a continuous unobstructed way of pedestrian passage by means of which the altered area may be ap-

proached, entered and exited and which connects the altered area with an exterior approach such as sidewalks, streets and parking areas, an entrance to the building or facility and other parts of the building or facility.

(g) "Place of employment" has the meaning given in s. 101.01 (2) (f), Stats.

Note: Section 101.01 (2) (f), Stats., reads "Place of employment" includes every place, whether indoors or out or underground and the premises appurtenant thereto where either temporarily or permanently any industry, trade or business is carried on, or where any process or operation, directly or indirectly related to any industry, trade or business, is carried on, and where any person is, directly or indirectly, employed by another for direct or indirect gain or profit, but does not include any place where persons are employed in a private domestic service which does not involve the use of mechanical power or in farming. "Farming" includes those activities specified in s. 102.04 (3), and also includes the transportation of farm products, supplies or equipment directly to the farm by the operator of said farm or employes for use thereon, if such activities are directly or indirectly for the purpose of producing commodities for market, or as an accessory to such production. When used with relation to building codes,"place of employment" does not include an adult family home certified under s. 50.032 (1) (b) or, except for the purposes of s. 101.11, a previously constructed building used as a community–based residential facility, as defined in s. 50.01 (1g), which serves 20 or fewer unrelated residents.

(h) "Primary function" means a major activity for which a building or facility is intended. Areas that contain a primary function include, but are not limited to, the customer service lobby of a bank, the dining area of a cafeteria, the meeting rooms in a conference center, as well as offices and other work areas in which the activities of the building or facility are carried out. Mechanical rooms, boiler rooms, supply storage rooms, employe lounges or locker rooms, janitorial closets, entrances, corridors and toilet rooms are not areas containing a primary function.

(i) "Professional office of a health care provider" means a location where a person or entity regulated by a State to provide professional services related to the physical or mental health of an individual makes such services available to the public.

(j) "Public building" has the meaning given in s. 101.01 (2) (g), Stats.

Note: Section 101.01 (2) (g), Stats., reads "Public building" means any structure, including exterior parts of such building, such as a porch, exterior platform or steps providing means of ingress or egress, used in whole or in part as place of resort, assemblage, lodging, trade, traffic, occupancy, or use by the public or by 3 or more tenants. When used in relation to building codes, "public building" does not include a previously constructed building used as a community–based residential facility as defined in s. 50.01 (1g) which serves 20 or fewer unrelated residents or an adult family home certified under s. 50.032 (1) (b).

(k) "Remodeling" means to substantially improve, alter, extend or otherwise change the structure of a building or change the location of exits, but shall not include maintenance, redecoration, reroofing or alteration of mechanical or electrical systems.

(L) "Shopping center or shopping mall" means a building or facility containing 5 or more tenant spaces where at least one space is occupied by a sales or rental establishment. Shopping center or shopping mall includes a building or a series of buildings on a common site, either under common ownership or common control or developed either as one project or as a series of related projects, containing sales or rental establishments. Sales and rental establishments include areas such as bakeries, grocery stores, clothing stores, and hardware stores.

(m) "Specified public transportation" means transportation by bus, rail, or any other conveyance, other than by aircraft, that provides the general public with general or special service, including charter service, on a regular and continuing basis.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; cr. (2) (am), (ar) and (cm), Register, December, 1997, No. 504, eff. 1–1–98.

Subpart 4 – Accessible elements and spaces: scope and technical requirements

Comm 69.16 Applications [ADAAG 4.1.1]. **(1)** APPLICATION BASED ON BUILDING USE. [ADAAG4.1.1 (2)]. These are department rules in addition to the requirements of ADAAG 4.1.1 (2):

(a) *General requirements.* Except as specified in par. (b), buildings or facilities used as places of worship shall comply with s. Comm 69.18, ADAAG 4.1 to 4.35 and all other applicable requirements of this chapter.

(b) *Sanctuary areas.* Sanctuary areas shall be made accessible to persons with disabilities in accordance with the following:

1. An accessible route shall be provided throughout the sanctuary floor area, including choir areas and other similar areas raised or depressed by not more than 3 feet from the accessible floor. Access is not required to the chancel or to baptisteries.

2. Wheelchair seating spaces in assembly areas shall comply with the requirements specified in ADAAG 4.1.3 (19) and ADAAG 4.33.

(2) EQUIPMENT SPACES [ADAAG 4.1.1 (5)]. (a) *Variances [ADAAG 4.1.1 (5) (a)].* This is a department rule in addition to the requirements of ADAAG 4.1.1 (5) (a): Spaces frequented only by service personnel for maintenance, repair, or occasional monitoring of equipment are not required to be accessible. Such spaces include but are not limited to elevator pits, elevator penthouses, mechanical, electrical, or communications equipment rooms, piping or equipment catwalks, water or sewage treatment pump rooms and stations, electric substations and transformer vaults, and highway and tunnel utility facilities.

(b) *General exceptions [ADAAG 4.1.1 (5)].* This is a department rule in addition to the requirements of ADAAG 4.1.1 (5) (b): Variances from the requirements of this chapter may be permitted only through the petition for variance procedures specified in s. Comm 69.10.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.17 Accessible elements and spaces: scope and technical requirements [ADAAG 4.1.2]. **(1)** PARKING [ADAAG 4.1.2 (5)]. (a) *General parking [ADAAG 4.1.2 (5)].* This is a department rule in addition to the requirements of ADAAG 4.1.2 (5): A vehicle may be parked backwards in an accessible parking space.

Note: Backing into parking spaces accommodates a person transferring from a vehicle by either the passenger or driver side of the vehicle.

(b) *Access aisle [ADAAG 4.1.2 (5) (a) and (b)].* This is a department rule in addition to the requirements of ADAAG 4.1.2 (5) (a) and (b): An access aisle adjacent to an accessible parking space may be identified by a sign or by cross–hatch painting as shown in the ADAAG standards, Appendix A4.6.3, Figure A5. Complete painting of the access aisle and parking space is prohibited.

(c) *Valet parking [ADAAG 4.1.2 (5) (e)].* Substitute the following wording for ADAAG 4.1.2 (5) (e): Valet parking: Where valet parking is offered at a building or facility, the valet parking facility shall be designed in accordance with the following:

1. At least one passenger loading zone complying with ADAAG 4.6.6 shall be located on an accessible route to an accessible entrance of a building or facility.

2. Accessible parking spaces shall be provided at the rate of 2% of the total number of spaces with a minimum of one. The accessible parking spaces shall be located on an accessible route to an accessible entrance to a building or facility.

3. At least one space shall be van accessible as specified in ADAAG 4.1.2 (5) (b).

4. An accessible parking space shall be designated in accordance with sub. (2).

(2) SIGNAGE. [ADAAG 4.1.2 (7)] Substitute the following wording for ADAAG 4.1.2 (7):

(a) *Building signage.* Signs which designate permanent rooms and spaces shall comply with ADAAG 4.30.1, 4.30.4, 4.30.5 and 4.30.6. Other signs which provide direction to, or information about, functional spaces of the building shall comply with ADAAG 4.30.1, 4.30.2, 4.30.3 and 4.30.5. Elements and spaces of accessible facilities which shall be identified by the Internation-

al Symbol of Accessibility and which shall comply with ADAAG 4.30.7 are:

1. Accessible passenger loading zones;

2. Accessible entrances when not all are accessible. Inaccessible entrances shall have directional signage to indicate the route to the nearest accessible entrance;

3. Accessible toilet and bathing facilities when not all are accessible.

(b) *Parking signage.* When the parking spaces for a building or facility are divided between employe and visitor parking, the accessible parking spaces for the employes may be identified with signs other than the Trans 200.07 sign. The accessible parking spaces for the visitors shall be identified with a sign complying with s. Trans 200.07.

Note: See Appendix A for a reprint of s. Trans 200.07.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; am. (1) (c) 2., r. and recr. (2) (b), Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.18 Accessible buildings: new construction requirements [ADAAG 4.1.3]. (1) NEW CONSTRUCTION REQUIREMENTS. Substitute the following wording for ADAAG 4.1.3, intro. paragraph: Except as specified in s. Comm 69.04, all buildings and facilities shall comply with the minimum requirements of ADAAG 4.1.3.

(1m) ACCESSIBLE ROUTE. [ADAAG 4.1.3 (1)] These are department rules in addition to the requirements of ADAAG 4.1.3 (1): An accessible route shall be provided in accordance with the following:

(a) *Accessible floor.* Except as specified in sub. (2), an accessible route shall be provided to at least one accessible floor of a building or facility less than 3 stories and with a gross area of 20,000 square feet or less. The accessible floor shall comply with the following:

1. The accessible floor level shall be a floor where a primary function of the building or facility is carried out for the benefit of the employes or patrons, or both. When common–use areas, including lunchrooms, change rooms, locker rooms or conference rooms, are provided in the building or facility, the accessible floor level shall contain at least one of each type of common–use area. The common–use areas on the accessible floor shall provide comparable services and amenities to the common–use areas provided on inaccessible floors.

2. An accessible route shall be provided throughout the entire accessible floor, including all areas raised or depressed by not more than 3 feet from the accessible floor. Interior accessible routes may include ramps complying with this chapter and ADAAG 4.8 or passenger elevators, limited–use elevators or wheelchair platform lifts complying with this chapter and ch. Comm 18.

(b) *Accessible route to primary function.* The accessible route from the accessible entrances to areas of primary function may serve but shall not pass through kitchens, storage rooms, toilet rooms, bathrooms, closets or other similar spaces.

(2) ELEVATOR ACCESS. [ADAAG 4.1.3 (5)] These are department rules in addition to the requirements of ADAAG 4.1.3 (5):

(a) *Access to all floors.* 1. Except as specified in subd. 2., at least one passenger elevator complying with ADAAG 4.10 shall serve each floor level, including mezzanines, in the following buildings or facilities:

a. Buildings and facilities 3 stories or greater in height where at least one story contains 3,000 square feet or more.

b. Government–owned or operated facilities.

c. Shopping centers or shopping malls.

d. Professional offices of a health care provider.

e. Transportation facilities.

2. Elevator access is not required to the following:

a. Unoccupied floor levels used for the storage of goods, merchandise, products or wares. The storage floor level may not be used as a permanent workstation for any employee, as a common–use area for employes, or by the public for any reason. If the use of the storage floor level changes to that of an occupied space, a passenger elevator complying with this chapter and ch. Comm 18 shall be installed to provide an accessible route of travel between the floor levels.

b. Floor levels with additional residential detention cells, if the accessible residential detention cells comply with s. Comm 69.49 (2).

c. Government–owned or operated buildings or facilities that are less than three stories and that are not open to the general public, if the story above or below the accessible ground floor has a capacity of no more than five persons and is less than 500 square feet. The story above or below the accessible ground floor that is less than 500 square feet shall have a sign stating the maximum capacity and the sign shall be placed in a conspicuous location at the main entrance to the floor level.

Note: Examples may include, but are not limited to, drawbridge towers and boat traffic towers, lock and dam control stations, press boxes, and train dispatching towers.

(b) *Gross area greater than 20,000 square feet.* 1. Except as specified in subds. 2. and 3., one passenger elevator, limited–use elevator, wheelchair platform lift or ramp shall serve each floor level, including mezzanines, in all buildings or facilities with a gross area greater than 20,000 square feet.

2. Access is not required to the following:

a. Mezzanines with additional employment areas.

b. Mezzanines with common–use areas where the common–use areas are comparable to those provided on an accessible floor level.

c. Floor levels with additional sleeping rooms in transient lodging buildings or facilities, if the building or facility complies with this chapter and ADAAG 9.1.1 to 9.4.

d. Unoccupied floor levels used for the storage of goods, merchandise, products or wares. The storage floor level may not be used as a permanent workstation for any employe, as a common–use area for employes, or by the public for any reason. If the use of the storage floor level changes to that of an occupied space, an accessible route of travel between floor levels shall be provided in accordance with this subsection.

3. Elevators complying with ADAAG 4.10 shall serve each floor level in buildings and facilities as specified in par. (a).

(3) AREAS OF RESCUE ASSISTANCE [ADAAG 4.1.3 (9)]. (a) *General [ADAAG 4.1.3 (9)].* This is a department informational note to be used under ADAAG 4.1.3 (9):

Note: See s. Comm 69.15 (2) (cm) for definition of exit.

(b) *Exception [ADAAG 4.1.3 (9) EXCEPTION].* This is a department rule in addition to the requirements of ADAAG 4.1.3 (9) Exception: Areas of rescue assistance are not required at exits from unoccupied floor levels used for storage as specified in sub. (2) (a) 2. a. and (b) 2. d.

(4) TOILET FACILITIES. [ADAAG 4.1.3 (11)] This is a department rule in addition to the requirements of ADAAG 4.1.3 (11): Other toilet rooms provided for the use of occupants of specific spaces including a private toilet room for the occupant of a private office shall be sized in accordance with ADAAG 4.22 and shall be provided with solid blocking in the walls for the later installation of grab bars.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. Register, December, 1997, No. 504, eff. 1–1–98; emerg. cr. (2) (a) 2. c., eff. 5–14–98; cr. (2) (a) 2. c., Register, December, 1998, No. 516, eff. 1–1–99.

Comm 69.19 Accessible building: additions [ADAAG 4.1.5]. Substitute the following wording for ADAAG 4.1.5:

(1) SPACES AND ELEMENTS. (a) Except as specified in sub. (2) (a), each space or element added to an existing building or facility

shall comply with the applicable provisions of this chapter, ADAAG 4.1.1 to 4.1.3, minimum requirements for new construction, and the applicable technical specifications of ADAAG 4.2 to 4.35 and sections 5 through 10.

(2) ADDITIONS AS ALTERATIONS. (a) Where an addition to an existing building or facility is constructed only to enclose an elevator, limited–use elevator or vertical wheelchair platform lift, the construction shall be considered an alteration.

(b) Each addition that affects or could affect the usability of an area containing a primary function shall comply with ADAAG 4.1.6 (2).

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.20 Accessible buildings: alterations [ADAAG 4.1.6]. **(1)** EXCEPTIONS. [ADAAG 4.1.6 (1) (k) (i)] This is a department rule in addition to the requirements of ADAAG 4.1.6 (1) (k) (i): An accessible route between floor levels shall be provided in an existing building or facility in accordance with s. Comm 69.18 and ADAAG 4.1.3, unless providing the path of travel is disproportionate as specified in s. Comm 69.10.

(2) ALTERATIONS TO AN AREA CONTAINING A PRIMARY FUNCTION. [ADAAG 4.1.6 (2)] These are department rules in addition to the requirements of ADAAG 4.1.6 (2): When providing a path of travel to an altered area is considered disproportionate to the overall alterations in terms of cost and scope, a SBD–10219 form shall be submitted along with the construction plans justifying the disproportionality.

(3) SPECIAL TECHNICAL PROVISIONS FOR ALTERATION TO EXISTING BUILDINGS AND FACILITIES [ADAAG 4.1.6 (3)]. (a) *Toilet rooms [ADAAG 4.1.6 (3) (e)].* This is a department rule in addition to ADAAG 4.1.6 (3) (e) (i): A unisex toilet room shall be designed in accordance with s. Comm 69.35 (1).

(b) *Platform lifts [ADAAG 4.1.6 (3) (g)].* These are department rules in addition to the requirements of ADAAG 4.1.6.(3) (g):

1. Limited–use elevators or vertical or inclined wheelchair lifts complying with ch. Comm 18 may be used as part of an accessible route. The accessible route shall be clearly designated and maintained.

Note: A limited–use elevator as used in this chapter does not qualify as a full passenger elevator complying with ADAAG 4.10 or the ASME A17.1 Elevator Code, but it exceeds the requirements of a vertical or inclined wheelchair lift. A limited–use elevator may be used in lieu of a vertical or inclined wheelchair lift.

2. Stairway chairlifts are not acceptable as meeting the accessibility requirements of this chapter. Stairway chairlifts installed in buildings or facilities for other purposes shall comply with ch. Comm 18 and the applicable portions of chs. Comm 50 to 64.

3. Residential elevators may only be used as specified in ch. Comm 18.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.21 Accessible buildings: historic [ADAAG 4.1.7]. Substitute the following wording for ADAAG 4.1.7 (1) (b): A qualified historic building means a building or facility complying with the definition specified in s. Comm 70.02 (1).

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.22 Wheelchair passage width [ADAAG 4.2.1]. This is a department rule in addition to the requirements of ADAAG 4.2.1: The width of an exit passageway shall comply with the applicable occupancy requirements in chs. Comm 50 to 64.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.23 Accessible route [ADAAG 4.3]. **(1)** WIDTH [ADAAG 4.3.3]. This is a department rule in addition to the requirements of ADAAG 4.3.3: Figures 7 (a) and 7. (b) shall not apply to ramp designs.

(2) SLOPE [ADAAG 4.3.7]. This is a department rule in addition to the requirements of ADAAG 4.3.7: Handrails, curbs or other forms of protection shall be provided on the sides of an accessible route where the adjacent terrain exceeds a 25%, 1:4, downward slope away from the accessible route.

(3) LOCATION AND CONSTRUCTION [ADAAG 4.3.11.1]. Substitute the following wording for ADAAG 4.3.11.1: An area of rescue assistance shall be one of the following:

(a) A portion of a balcony to or a stairway landing within a smokeproof stair tower meeting the fire–rated enclosure requirements as specified in s. Comm 51.17;

(b) A portion of a landing of an exterior exit stairway. Any opening to the interior of the building located within 20 feet of the area of rescue assistance shall be protected with a fire door or window assembly having a 3/4–hour fire protection rating;

(c) A portion of a corridor meeting the fire–rated enclosure requirements as specified in Table 51.03–A. The area of rescue assistance shall be immediately adjacent to a stairway enclosure meeting the fire–rated construction as specified in s. Comm 51.02 (11);

(d) A vestibule located immediately adjacent to an exit enclosure and constructed to the same fire–resistive standards as required for corridors and openings;

(e) A portion of a landing within a stairway enclosure which is vented to the exterior and is separated from the interior of the building with fire–rated construction as specified in s. Comm 51.02 (11);

(f) A smoke–barrier provided in a health care facility as specified in ch. Comm 58, subch. I; or

(g) A horizontal exit as specified in s. Comm 51.19.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.24 Protruding objects [ADAAG 4.4.1]. **(1)** GENERAL, OBJECTS AT CORNER. These are department rules in addition to ADAAG 4.4.1: A protruding object such as, but not limited to, a telephone, water cooler, or planter shall be installed not less than 36 inches from any corridor wall corners.

(2) GENERAL, CLEAR WIDTH. Substitute the following wording for the last sentence of ADAAG 4.4.1: A protruding object shall not reduce the clear width of an accessible route, maneuvering space or the required exit width as specified in chs. Comm 50 to 64.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.245 Parking spaces [ADAAG 4.6.3]. These are department rules in addition to the requirements of ADAAG 4.6.3:

(1) PARKING ACCESS AISLE AND ACCESSIBLE ROUTE. Except as specified in sub. (2), a parking access aisle shall lead to an accessible route. The accessible route shall comply with all of the following:

(a) Lead to an accessible building entrance.

(b) Not be located within the traffic lanes, except as permitted in par. (c).

(c) Cross the flow of traffic only at marked crossings.

(d) Be protected by physical barriers, including wheel stops, curbs or bollards, when located between rows of parking spaces or when located between parking spaces and a building.

(2) EXEMPTION. Where it is technically infeasible to redesign an existing parking lot to provide an accessible route complying with sub. (1), an accessible route may be located within a traffic lane providing the accessible route leads to an accessible building entrance or to a marked crossing leading to an accessible building entrance.

Note: See Appendix A for examples of parking access aisles and accessible routes.

History: Cr. Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.25 Curb ramps [ADAAG 4.7]. **(1)** WIDTH [ADAAG 4.7.3]. Substitute the following wording for ADAAG 4.7.3: The minimum width of a curb ramp shall be 40 inches, exclusive of flared sides.

(2) SURFACE [ADAAG 4.7.4]. Substitute the following wording for ADAAG 4.7.4: The surface of a curb ramp, excluding the flared sides, shall comply with ADAAG 4.5 and s. Comm 69.37.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.26 Ramps [ADAAG 4.8]. **(1)** CLEAR WIDTH. [ADAAG 4.8.3] Substitute the following wording for ADAAG 4.8.3:

(a) *Exterior ramps.* The minimum clear width of a ramp shall be 40 inches, measured between the handrails.

(b) *Interior ramps.* The minimum clear width of an interior ramp shall be 36 inches, measured between the handrails.

(2) LANDINGS. [ADAAG 4.8.4] This is a department informational note to be used under ADAAG 4.8.4:

Note: See s. Comm 51.162 for guardrail requirements.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. (2), Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.27 Stairs [ADAAG 4.9]. **(1)** RISER AND TREAD [ADAAG 4.9.2]. This is a department rule in addition to the requirements of ADAAG 4.9.2: On any given flight of stairs, all steps shall have uniform riser heights and uniform tread widths. Maximum riser height shall be 7 inches and the minimum riser height shall be 4 inches. Minimum tread depth shall be 11 inches measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. Open risers are not permitted.

(2) HANDRAILS [ADAAG 4.9.4]. This is a department informational note to be used under ADAAG 4.9.4:

Note: See s. Comm 51.161 (6) for requirements for handrails at stairways.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. (2), Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.275 Elevators [ADAAG 4.10]. This is a department rule in addition to the requirements of ADAAG 4.10: Each elevator car shall have a handrail mounted on the back or side wall of the car. The top of the handrail shall be mounted between 34 to 38 inches above the car floor. The space between the wall and the handrail shall be 1–1/2 inches. The handrail shall not project more than 4 inches from the wall.

History: Cr. Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.28 Platform lifts [ADAAG 4.11]. Substitute the following wording for ADAAG 4.11.2: If limited–use elevators, vertical or inclined wheelchair lifts, stairway chairlifts or residential elevators are installed in a building or facility as permitted by this chapter, they shall comply with ch. Comm 18.

Note: See Appendix A for examples of the minimum platform size for vertical or inclined wheelchair lifts and limited–use elevators.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.29 Doors [ADAAG 4.13]. **(1)** MANEUVERING CLEARANCES AT DOORS. [ADAAG 4.13.6] This is a department rule in addition to the requirements of ADAAG 4.13.6: A door recessed more than 8 inches, measured from the face of the door to the face of the wall, shall be considered a door in an alcove and the maneuverability clearances shown in Figure 25 (a) shall be provided.

(2) TWO DOORS IN SERIES. [ADAAG 4.13.7] This is a department rule in addition to the requirements of ADAAG 4.13.7: Doors with a screen door or storm door shall be considered doors in series and shall comply with ADAAG 4.13.7.

Note: See Appendix A for examples of doors in series.

(3) AUTOMATIC DOORS AND POWER–ASSISTED DOORS. [ADAAG 4.13.12] Substitute the following wording for ADAAG 4.13.12: If an automatic door is used, then it shall comply with ANSI/BHMA A156.10–1991. Slowly opening, low–powered, automatic doors shall comply with ANSI A156.19–1990. Such doors shall not open to back check faster than 3 seconds and shall require no more than 15 pounds of force to stop door movement. If a power–assisted door is used, its door–opening force shall comply with ADAAG 4.13.11 and its closing shall conform to the requirements in ANSI A156.19–1990.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.30 Toilet stalls [ADAAG 4.17]. **(1)** SIZE AND ARRANGEMENT. [ADAAG 4.17.3] Substitute the following wording for the exception under ADAAG 4.17.3: In instances of alteration work where a standard stall [Fig. 30 (a)] is not structurally possible or where the number of sanitary fixtures required by chs. Comm 50 to 64 prevent combining existing stalls to provide space, the following stalls may be used in lieu of the standard stall:

(a) A toilet stall measuring 36 inches in width by 78 inches in length. The toilet stall shall have an outswinging door located at the end of the stall and the door opening shall provide a minimum of 32 inches of clear opening;

(b) A toilet stall measuring at least 36 inches in width by at least 90 inches in length. The toilet stall shall have an outswinging door located at the side of the stall and the door be at least 36 inches in width and shall provide a minimum clear opening specified in ADAAG 4.1.6 (3) (d); or

(c) A toilet stall measuring at least 48 inches in width by at least 69 inches in length. The toilet stall shall have an outswinging stall door located at the end of the stall. The toilet stall door shall provide a minimum of 32 inches of clear opening. The water closet shall be offset as shown in ADAAG 4.17.3, Fig. 30 (b) the bottom diagram.

(2) DOORS [ADAAG 4.17.5]. This is a department rule in addition to the requirements of ADAAG 4.17.5: A toilet stall door shall open at least 95 degrees and shall be self–closing by gravity.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; renum. (1) and (2) to be (2) and (1) and am. (1) (c), r. and recr. (1) (b), Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.32 Faucets [ADAAG 4.19.5]. This is a department rule in addition to the requirements of ADAAG 4.19.5: A foot–controlled faucet is prohibited for use on an accessible lavatory.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.34 Shower stalls [ADAAG 4.21]. **(1)** SIZE AND CLEARANCES [ADAAG 4.21.2]. This is a department rule in addition to the requirements of ADAAG 4.21.2: The shower stall in ADAAG Figure 35 (a) shall be 36 inches by 36 inches, measured from inside wall to inside wall.

(3) SHOWER ENCLOSURES [ADAAG 4.21.8]. This is a department rule in addition to the requirements of ADAAG 4.21.8: A swing–door is prohibited on an accessible shower stall.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. (2), Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.35 Toilet rooms, clear floor space [ADAAG 4.22.3]. **(1)** TOILET ROOMS. This is a department rule in addition to the requirements of ADAAG 4.22: A toilet room containing one water closet and one lavatory shall be designed to provide the minimum space requirements as shown in Figure 69.35–1 to 69.35–5 or as approved by the department.

Note: These room dimensions were derived using a lavatory with a maximum width of 19 inches. If a lavatory with a wider dimension is used, the room width would need to be increased.

(2) CLEAR FLOOR SPACE. This is a department rule in addition to the requirements of ADAAG 4.22.3: In a toilet room containing a tub, water closet and lavatory, the water closet shall not infringe on the clear floor space specified in ADAAG 4.20.3, Figure 33.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. (2), Register, December, 1997, No. 504, eff. 1–1–98.

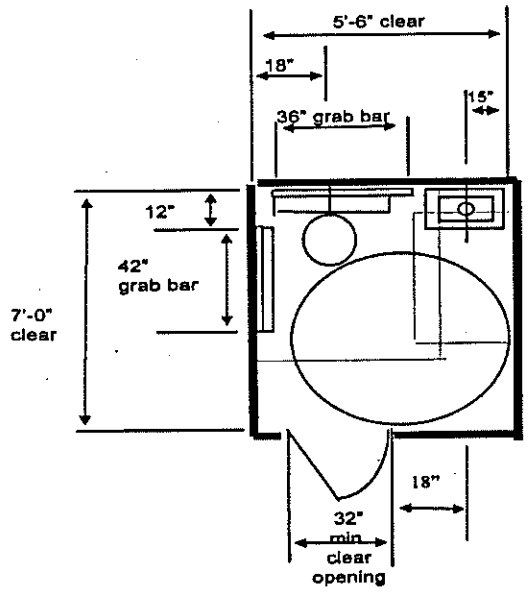


Figure 69.35-1/Toilet Room

Clear floor space at fixtures
48" by 66" at water closet
30" by 48" at lavatory

60" diameter turning space

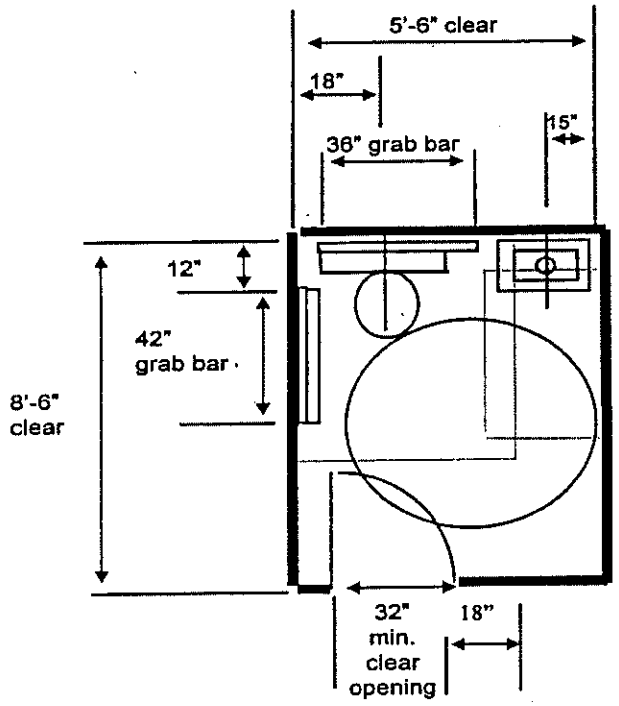


Figure 69.35-2/Toilet Room

Clear floor space at fixtures
48" by 66" at water closet
30" by 48" at lavatory

60" diameter turning space

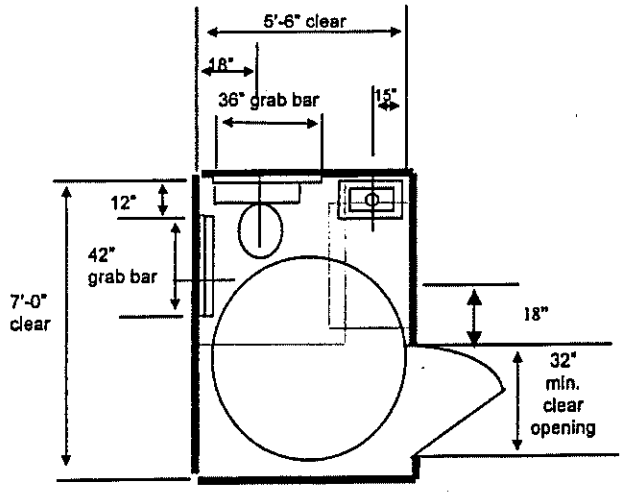


Figure 69.35-3/Toilet Room

Clear floor space at fixtures
48" by 56" at water closet
30" by 48" at lavatory

60" diameter turning space

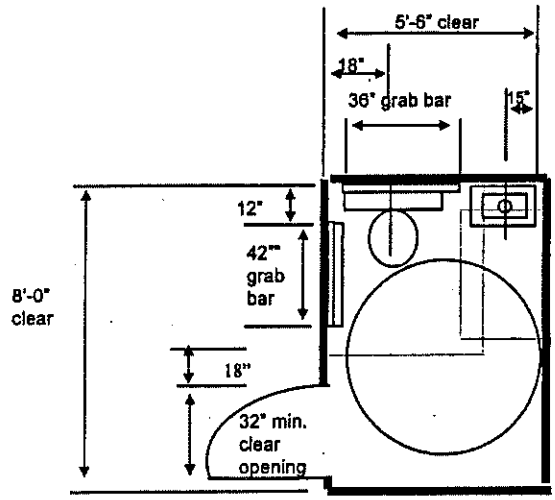


Figure 69.35-4/Toilet Room

Clear floor space at fixtures
48" by 56" at water closet
30" by 48" at lavatory

60" diameter turning space

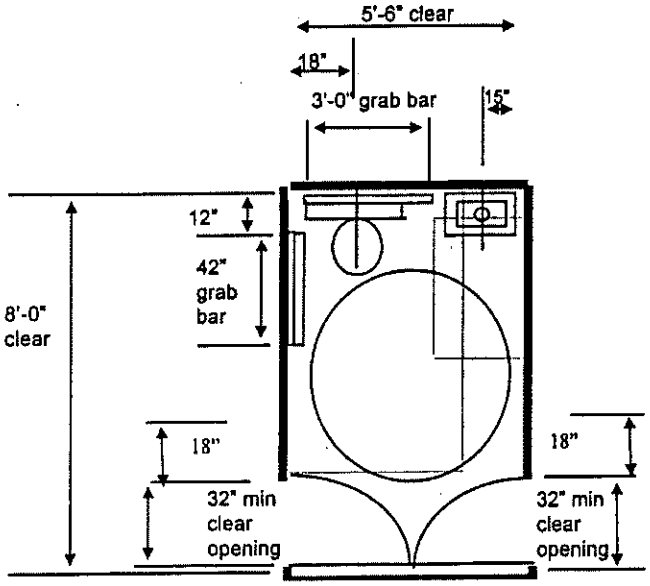


Figure 69.35-5/Toilet Room

Clear floor space at fixtures
48" by 56" at water closet
30" by 48" at lavatory

60" diameter turning space

Comm 69.36 Size and spacing of grab bars and handrails [ADAAG 4.26.2]. Substitute the following wording for ADAAG 4.26.2:

(1) HANDRAIL OR GRAB BAR SIZE. [ADAAG 4.26.2] This is a department rule in addition to the requirements of ADAAG 4.26.2: The handgrip portion of handrails shall have a smooth surface with no sharp corners. Handrails as shown in ADAAG Figure 39 (b) and (c) are not acceptable for stairways or ramps required to comply with s. Comm 51.16.

(2) HANDGRIP PORTION. The handgrip portion of a handrail shall be graspable along the entire length of the handrail.

(3) MOUNTING ADJACENT TO WALLS. If a handrail is mounted adjacent to the wall, the space between the wall and the handrail shall be $1-1/2$ inches. A handrail may be located in a recess if the recess is a maximum of 3 inches deep and extends at least 18 inches above the top of the rail as shown in ADAAG Figure 39 (d).

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. (1), Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.37 Detectable warnings on walking surfaces [ADAAG 4.29.2]. Substitute the following wording for the requirements of ADAAG 4.29.2:

(1) SURFACE TEXTURING. Surface texturing shall consist of linear impressions one–fourth of an inch to three–eighths of an inch deep, oriented to provide a uniform pattern of diamond shapes. The diamond shape shall measure approximately $1-1/4$ inches wide by $2-1/4$ inches long, with the length of the diamond shape parallel to direction of pedestrian movement. The diamond shape shall be spaced one–fourth of an inch to three–eighths of an inch apart. This surface texture may be achieved by impressing and removing expanded metal regular industrial mesh into the surface of the ramp while the concrete is in a plastic state.

(2) INTERIOR SURFACES. Detectable warnings used on interior surfaces shall differ from adjoining walking surfaces in resiliency or sound–on–cane contact.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

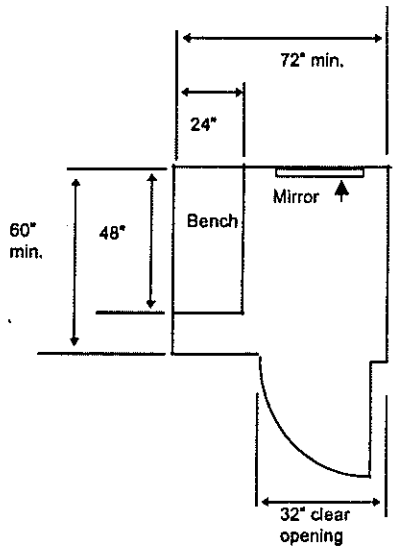
Comm 69.375 Assembly seating [ADAAG 4.33.3]. This is a department rule in addition to the requirements of ADAAG 4.33.3, Exception: The clustered seating specified for bleachers, balconies and other areas having sight lines that require slopes of greater than 5% shall be located on an accessible route and integrated within the assembly seating.

History: Cr. Register, December, 1997, No. 504, eff. 1–1–98.

Comm 69.39 Dressing and fitting rooms [ADAAG 4.35]. **(1)** GENERAL [ADAAG 4.35.1]. This rule is a department rule in addition to the requirements of ADAAG 4.35.1: A dressing or fitting room shall be designed to provide the minimum space requirements as shown in Figure 69.39, or as approved by the department.

(2) CLEAR FLOOR SPACE [ADAAG 4.35.2]. Modify ADAAG 4.35.2 by eliminating the last sentence.

Figure 69.39
MINIMUM SIZE OF DRESSING AND FITTING ROOMS



History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Subpart 5 – Restaurants and cafeterias

Comm 69.40 Restaurants and cafeterias [ADAAG 5.0]. **(1)** GENERAL [ADAAG 5.1]. These are department rules in addition to the requirements of ADAAG 5.1:

(a) The requirements in this section apply to taverns and any other type of eating or drinking establishments.

(b) At least 5% of all types of seating shall be accessible. The accessible seating shall be integrated throughout the seating areas and shall comply with ADAAG 4.32.

(2) DINING AREAS [ADAAG 5.4]. This is a department rule in addition to the requirements of ADAAG 5.4: Any area raised or depressed by not more than 3 feet from the principal floor level shall be ramped in accordance with ADAAG 4.8.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Subpart 6 – Medical care facilities

Comm 69.41 Medical care facilities [ADAAG 6.0]. Substitute the following wording for ADAAG 6.1 (1): At least 10% of patient bedrooms and toilet rooms, but not less than one bedroom and toilet room shall be available to patients regardless of the unit of care that they are assigned to or type of treatment they are receiving, and all public use and common use areas shall be designed and constructed to be accessible.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Subpart 7 – Business and mercantile

Comm 69.415 General [ADAAG 7.1]. Substitute the following wording for ADAAG 7.1:

(1) AREAS USED FOR BUSINESS TRANSACTIONS. In addition to the requirements of ADAAG 4.1 to 4.35, the design of all areas used for business transactions with the public shall comply with ADAAG 7.

(2) MINI–STORAGE BUILDINGS. At least 5% of mini–storage buildings, with a minimum of one of each type of storage area, shall be accessible. The entrances to the accessible storage units shall comply with ADAAG 4.13. The accessible entrances shall

be on an accessible route complying with ADAAG 4.5. The accessible route is not required to be paved.

History: Cr. Register, December, 1997, No., 504, eff. 1–1–98.

Subpart 8 – Libraries

Note: There are no changes, additions or omissions to ADAAG 8.0, Libraries.

Subpart 9 – Accessible transient lodging

Comm 69.42 Accessible transient lodging [ADAAG 9.0]. Substitute the following wording for ADAAG 9.1.2: Accessible sleeping rooms or suites that comply with the requirements of ADAAG 9.2 shall be provided in conformance with Table 69.42. In addition, in hotels of 50 or more sleeping rooms or suites, additional accessible sleeping rooms or suites that include a roll–in shower shall also be provided in conformance with Table 69.42. Rooms with accessible shower stalls shall comply with the requirements of ADAAG 9.2, 4.21 and Figure 57 (a) or (b).

TABLE 69.42

Number of Rooms	Accessible Rooms	Rooms with Roll–in Showers
0 to 50	5% of total with min. of 1	
51 to 100	5% of total	1
101 to 200	5% of total	2
201 to 300	5% of total	3
301 to 400	5% of total	4
401 to 500	5% of total	4 plus 1 for each additional 100 over 400
501 and over	25 plus 1 for each 100 over 500	

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94; r. and recr. Register, December, 1997, No. 504, eff. 1–1–98.

Subpart 10 – Transportation facilities

Note: There are no changes, additions or omissions to ADAAG 10.0, Transportation Facilities.

Subpart 11 – Judicial, legislative, and regulatory facilities

Comm 69.45 General. Except as specified in s. Comm 69.04 (10), all judicial, legislative and regulatory facilities shall comply with the applicable requirements specified in ADAAG 4.1 to 4.35. All public and common use areas shall be designed and constructed to comply with ADAAG section 4.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Subpart 12 – Detention and correctional facilities

Comm 69.46 General. This subpart applies to jails, holding cells in police stations, prisons, juvenile detention centers, reformatories, and other institutional occupancies where the occupants are under some degree of restraint or restriction for security reasons. Except as specified in this subpart, detention and correctional facilities shall comply with the applicable requirements of ADAAG 4.1 through 4.35. All public and common use areas serving accessible cells or rooms are required to be designed and constructed to comply with ADAAG section 4.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.47 Entrances. (1) SECURED ENTRANCES. Where provided, at least one secured entrance shall comply with ADAAG 4.14. This requirement is in addition to the entrances that are required to be accessible by ADAAG 4.1.3 (8). A secured entrance is an entrance used only by inmates or detainees and security personnel and not the general public.

(2) SECURITY SYSTEMS. Where security systems are provided at public entrances required to be accessible by ADAAG 4.1.3 (8), an accessible route complying with ADAAG 4.3 shall be provided through fixed security barriers. Where security barriers incorporate equipment such as metal detectors, fluoroscopes, or other similar devices which cannot be made accessible, an accessible route shall be provided adjacent to the security screening devices to facilitate an equivalent path of travel.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.48 Residential cells or rooms: minimum number. (1) RESIDENTIAL CELLS OR ROOMS. At least 5% of the total number of residential cells or rooms, but not less than one of each type of cell or room, shall be accessible and comply with s. Comm 69.49.

(2) ALTERATIONS TO CELLS OR ROOMS. When residential cells or rooms are being altered in an existing facility, at least 5% of the number being altered shall be made accessible until the number of accessible residential cells or rooms equals the total number of accessible residential cells or rooms required for the facility.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.49 Requirements for accessible residential cells or rooms. (1) GENERAL. Cells or rooms required to [be] accessible by s. Comm 69.48 shall comply with this section.

(2) MINIMUM REQUIREMENTS. An accessible residential cell or room shall be on an accessible route complying with ADAAG 4.3. Where provided, the following elements or spaces serving accessible residential cells or rooms shall be accessible and connected by an accessible route. At least one of each type of common area, amenity, space, or element provided for another residential cell or room in the same category of housing shall be accessible. Vertical circulation between residential cell rooms in detention facilities is not required if all the accessible cells are located on an accessible floor level.

(a) *Doors and doorways.* All doors and doorways on an accessible route shall comply with ADAAG 4.13.

(b) *Restrooms.* At least one toilet facility shall comply with ADAAG 4.22 and one bathing facility shall comply with ADAAG 4.23. Where privacy screens are provided, they shall not intrude on the clear floor space required for fixtures and accessible route.

(c) *Beds.* A bed shall have a minimum 36 inches of clear width maneuvering space located along one side of the bed. Where more than one bed is provided in a room or cell, the clear space provided at adjacent beds may overlap.

(d) *Drinking fountains and water coolers.* Where provided, there shall be a drinking fountain accessible to an individual who uses a wheelchair in accordance with ADAAG 4.15 and one drinking fountain accessible to an individual who has difficulty bending or stooping.

(e) *Fixed or built–in seating or tables.* Fixed or built–in seating or tables within, or serving, accessible cells or rooms shall comply with ADAAG 4.1.3 (18).

(f) *Fixed benches.* A fixed bench shall be a minimum of 24 inches by 48 inches and be mounted at 17 to 19 inches above the finish floor. The structural strength of the bench attachments shall comply with ADAAG 4.26.3.

(g) *Storage.* At least one of each type of fixed or built–in storage facility provided, such as a cabinet, shelf, closet, or drawer shall contain storage space complying with ADAAG 4.25. Additional storage may be provided outside of the dimensions required by ADAAG 4.25.

(h) *Controls.* Any control intended for operation by an inmate shall comply with ADAAG 4.27.

(i) *Room accommodations, hearing impaired.* Room accommodations for persons with hearing impairments shall comply with s. Comm 69.50.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Comm 69.50 Visual alarms and telephones. (1) GENERAL. An auxiliary visual alarm complying with ADAAG 4.28.4 shall be provided in a residential cell or room which is served by an audible emergency warning system and which houses an inmate or detainee who is allowed an indepen-

dent means of egress. A permanently installed telephone shall have a volume control complying with ADAAG 4.31.5.

(2) EQUIVALENT FACILITATION. For purposes of this section, equivalent facilitation shall include the installation of electrical outlets, including outlets connected to a facility's central alarm system, and telephone wiring in the cell or room to enable inmates or detainees with hearing impairments to utilize portable visual alarms and communication devices made available by the operator of the facility.

History: Cr. Register, November, 1994, No. 467, eff. 12–1–94.

Chapter Comm 69
APPENDIX A

The material contained in this appendix is for clarification purposes only. The notes and illustrations are numbered to correspond to the number of the rule as it appears in the text of the code.

Trans 200.07 Handicapped parking signs. **(1)** PURPOSE. The purpose of this section is to define and illustrate the design, size and installation requirements of the official traffic signs required under s. 346.503 (1), Stats., related to reserved parking spaces for handicapped persons.

(2) SIGN DESCRIPTION. (a) The sign shall consist of a white rectangle with longer dimension vertical, having green message, a green arrow, if required under this section, and a blue and white international symbol for the barrier–free environments. The sign may be reflective or non–reflective.

(b) The sign shall include the words "reserved parking" and the words "vehicles with VET or DIS plates or state disabled card"or other words with a similar meaning.

(c) The size of the sign shall be not less than 12 inches by 18 inches. When used on a highway with a speed limit of more than 35 miles per hour, it shall be not less than 18 inches by 24 inches.

(d) A right arrow, left arrow or the words "This Stall" or similar wording shall be included near the bottom of the sign.

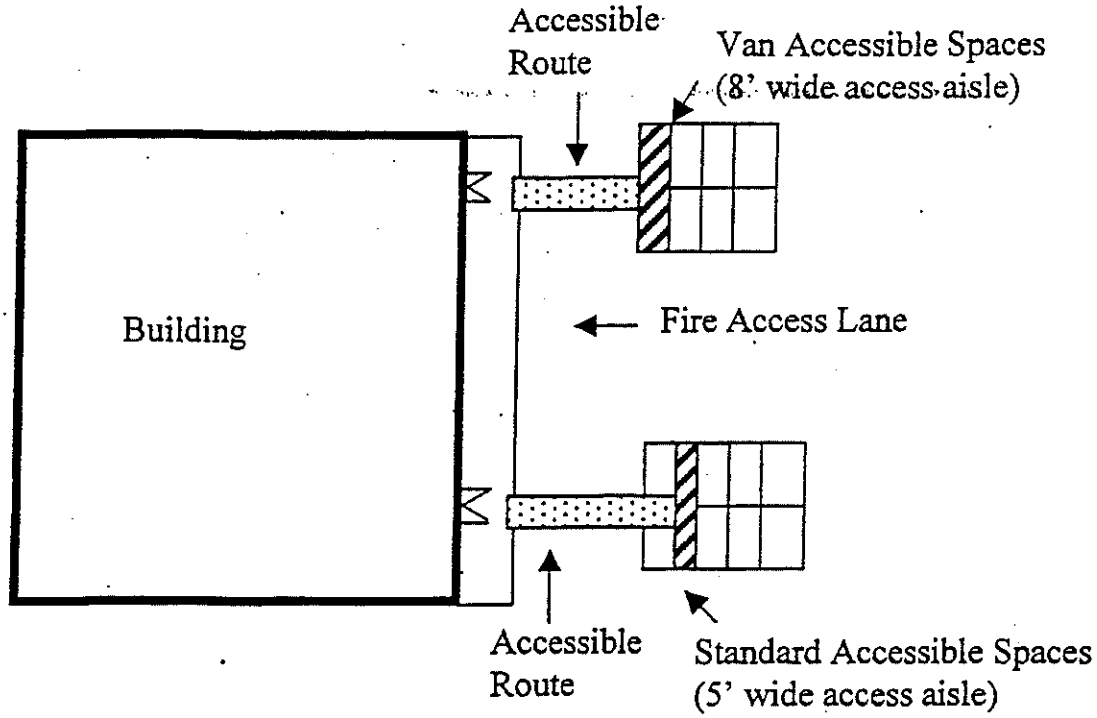
(3) SIGN PLACEMENT. Each sign shall be erected on an adequate support. On highways, the vertical distance from roadway to the bottom of a sign shall be not less than 7 feet, except when overhead obstructions necessitate a lower height. In off–highway parking lots, the vertical distance from the parking lot surface, or top of curb if any, to the bottom of a sign shall be not less than 4 feet. A single sign with the message "This Space" or similar wording shall be used to designate a single reserved space. At least 2 signs are required for multiple reserved spaces. When 2 signs are used they shall be located at the outermost limits of the spaces reserved and, by arrow, designate the location of the reserved spaces.

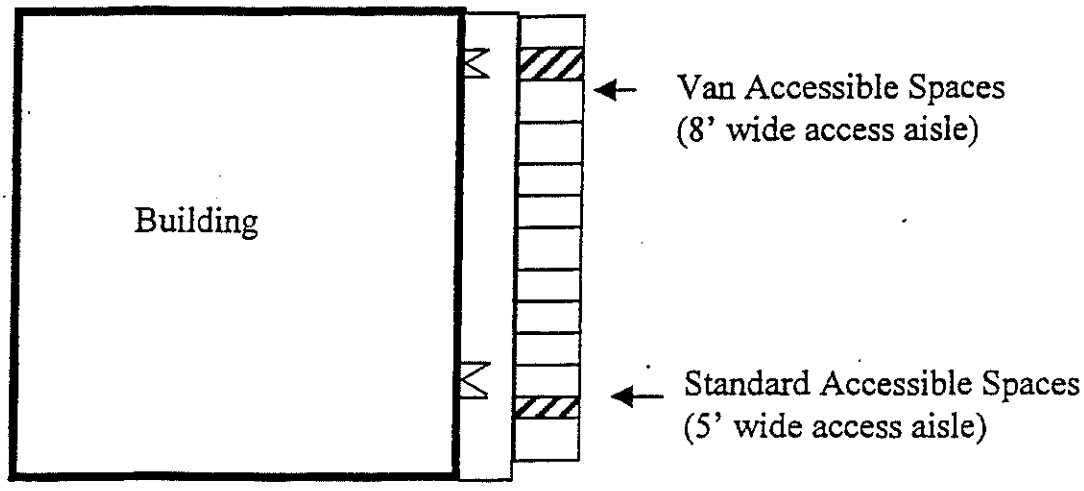
(a) A sign shall be located at the end of an angled or right–angled space and shall be set to face a motorist entering the space.

(b) When the reserved space is parallel to the edge of a roadway, a sign shall be set at an angle of approximately 30' with the line of traffic.

(4) Signs which are in place prior to May 1, 1983 may remain in place and have the same effect as the signs described herein for 5 years after May 1, 1983 provided that they include the international symbol for barrier–free environments and the wording required under sub. (2) (b) either as part of the original sign or on a supplementary placque or placques. The requirements under sub. (3) do not apply to these signs.

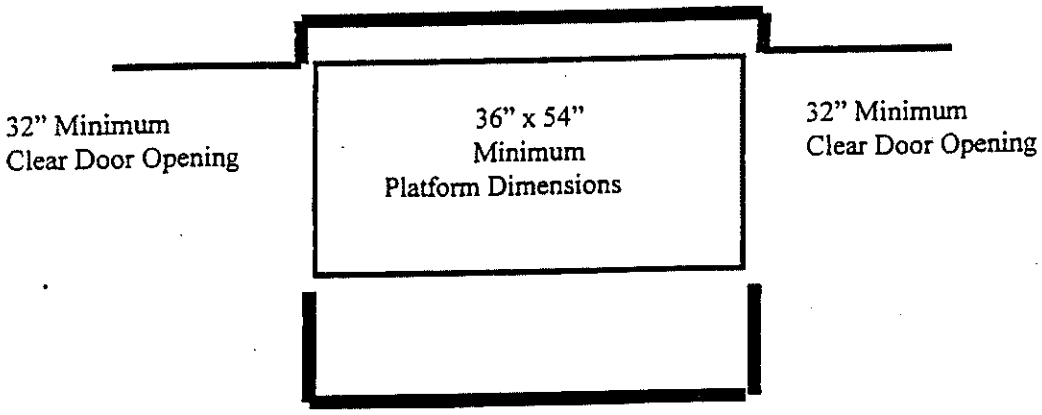
A-69.245 PARKING SPACES



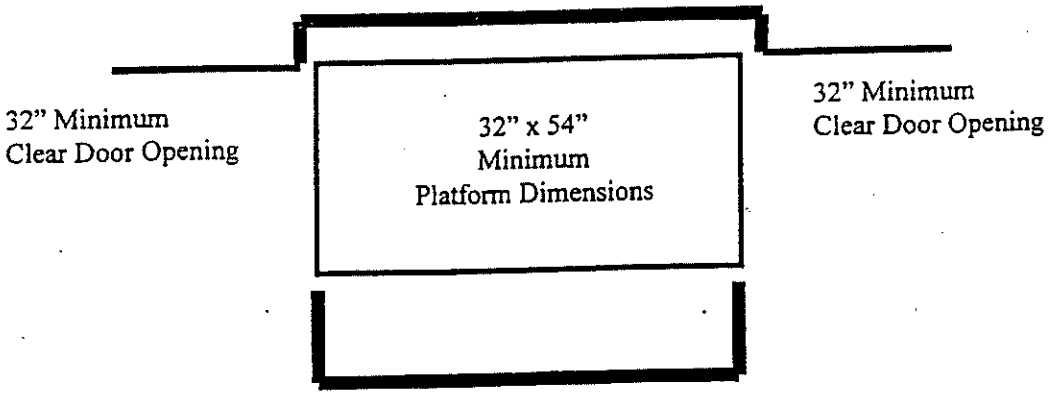


A-69.28 (2) PLATFORM DIMENSIONS FOR LIMITED-USE ELEVATORS AND VERTICAL AND INCLINED PLATFORM LIFTS

LIMITED-USE ELEVATORS

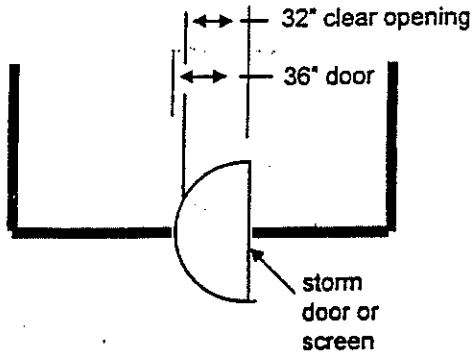


VERTICAL AND INCLINED PLATFORM LIFTS



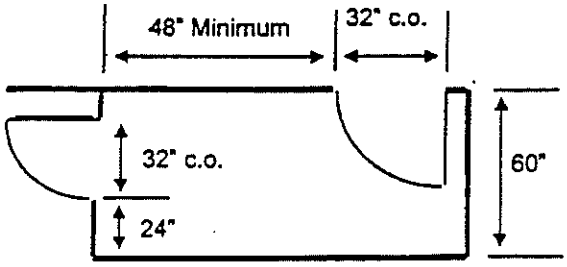
A-69.29 OFFSET DOORS IN SERIES

(a)



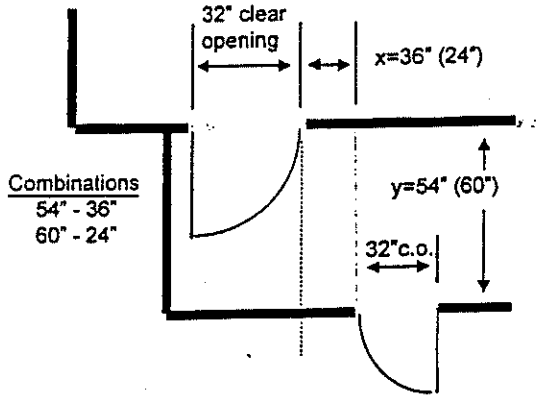
Note: A door with a screen or storm door is also considered a door in series. Adjacent doors as illustrated are not accessible. A minimum of 84 inches must be provided between the two doors.

(b)



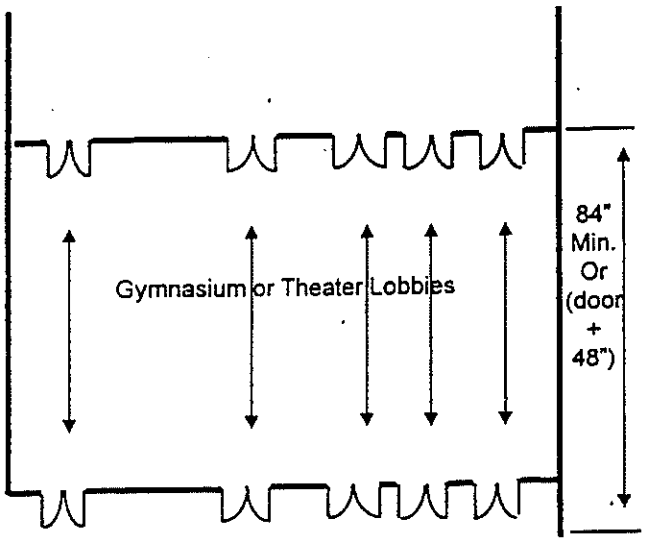
C.O. = clear opening

(c)



C.O. =clear opening

(d) Gymnasium/Theater



Doors in Series
In exits with multiple doors, the most direct path will be utilized to determine doors in series. Maneuvering across pedestrian traffic flow to use a door not in the direct exit path is not acceptable.

APPENDIX B
ADA ACCESSIBILITY GUIDELINES

For Buildings and Facilities as Incorporated Into Comm 69

ADOPTED ADAAG

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APPENDIX 92

1. PURPOSE.

This document sets guidelines for accessibility to buildings and facilities by individuals with disabilities under the Americans with Disabilities Act (ADA) of 1990. These guidelines are to be applied during the design, construction, and alteration of buildings and facilities covered by Titles II and III of the ADA to the extent required by regulations issued by Federal agencies, including the Department of Justice and the Department of Transportation, under the ADA.

The technical specifications 4.2 through 4.35, of these guidelines are the same as those of the American National Standard Institute's document A117.1-1980, except as noted in this text by italics. However, sections 4.1.1 through 4.1.7 and sections 5 through 10 are different from ANSI A117.1 in their entirety and are printed in standard type.

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2. GENERAL.

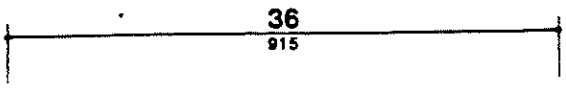
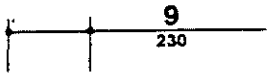
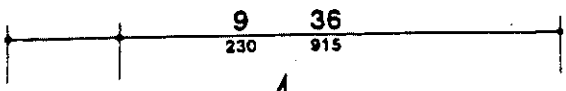
2.1 Provisions for Adults. *The specifications in these guidelines are based upon adult dimensions and anthropometrics.*

2.2 Equivalent Facilitation. *Departures from particular technical and scoping requirements of this guideline by the use of other designs and technologies are permitted where the alternative designs and technologies used will provide substantially equivalent or greater access to and usability of the facility.*

3. MISCELLANEOUS INSTRUCTIONS AND DEFINITIONS.

3.1 Graphic Conventions. Graphic conventions are shown in Table 1. Dimensions that are not marked minimum or maximum are absolute, unless otherwise indicated in the text or captions.

Table 1
Graphic Conventions

Convention	Description
	Typical dimension line showing U.S. customary units (in inches) above the line and SI units (in millimeters) below
	Dimensions for short distances indicated on extended line
	Dimension line showing alternate dimensions required
	Direction of approach
max	Maximum
min	Minimum
	Boundary of clear floor area
℄	Centerline

3.4 General Terminology

3.2 Dimensional Tolerances. All dimensions are subject to conventional building industry tolerances for field conditions.

3.3 Notes. The text of *these guidelines* does not contain notes or footnotes. Additional information, explanations, and advisory materials are located in the Appendix. Paragraphs marked with an asterisk have related, nonmandatory material in the Appendix. In the Appendix, the corresponding paragraph numbers are preceded by an A.

3.4 General Terminology.

comply with. Meet one or more specifications of *these guidelines*.

if, if ... then. Denotes a specification that applies only when the conditions described are present.

may. Denotes an option or alternative.

shall. Denotes a mandatory specification or requirement.

should. Denotes an advisory specification or recommendation.

3.5 Definitions.

Access Aisle. An accessible pedestrian space between elements, such as parking spaces, seating, and desks, that provides clearances appropriate for use of the elements.

Accessible. Describes a site, building, facility, or portion thereof that complies with *these guidelines*.

Accessible Element. An *element* specified by *these guidelines* (for example, telephone, controls, and the like).

Accessible Route. A continuous unobstructed path connecting all accessible elements and spaces of a building or facility. Interior accessible routes may include corridors, floors, ramps, elevators, lifts, and clear floor space at fixtures. Exterior accessible routes may include parking access aisles, curb ramps, *crosswalks at vehicular ways*, walks, ramps, and lifts.

Accessible Space. Space that complies with these guidelines.

Adaptability. The ability of certain building spaces and elements, such as kitchen counters, sinks, and grab bars, to be added or altered so as to accommodate the needs of *individuals with or without disabilities* or to accommodate the needs of persons with different types or degrees of disability.

Addition. *An expansion, extension, or increase in the gross floor area of a building or facility.*

Administrative Authority. A governmental agency that adopts or enforces regulations and *guidelines* for the design, construction, or *alteration* of buildings and facilities.

Alteration. *An alteration is a change to a building or facility made by, on behalf of, or for the use of a public accommodation or commercial facility, that affects or could affect the usability of the building or facility or part thereof. Alterations include, but are not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, changes or rearrangement of the structural parts or elements, and changes or rearrangement in the plan configuration of walls and full-height partitions. Normal maintenance, reroofing, painting or wallpapering, or changes to mechanical and electrical systems are not alterations unless they affect the usability of the building or facility.*

Area of Rescue Assistance. *An area, which has direct access to an exit, where people who are unable to use stairs may remain temporarily in safety to await further instructions or assistance during emergency evacuation.*

Assembly Area. A room or space accommodating a *group of* individuals for recreational, educational, political, social, or amusement purposes, or for the consumption of food and drink.

Automatic Door. A door equipped with a power-operated mechanism and controls that open and close the door automatically upon receipt of a momentary actuating signal. The switch that begins the automatic cycle may be a photoelectric device, floor mat, or manual switch (see power-assisted door).

Building. Any structure used and intended for supporting or sheltering any use or occupancy.

Circulation Path. An exterior or interior way of passage from one place to another for pedestrians, including, but not limited to, walks, hallways, courtyards, stairways, and stair landings.

Clear. Unobstructed.

Clear Floor Space. *The minimum unobstructed floor or ground space required to accommodate a single, stationary wheelchair and occupant.*

Closed Circuit Telephone. *A telephone with dedicated line(s) such as a house phone, courtesy phone or phone that must be used to gain entrance to a facility.*

Common Use. Refers to those interior and exterior rooms, spaces, or elements that are made available for the use of a restricted group of people (for example, *occupants of a homeless shelter*, the occupants of an office building, or the guests of such occupants).

Cross Slope. The slope that is perpendicular to the direction of travel (see running slope).

Curb Ramp. A short ramp cutting through a curb or built up to it.

Detectable Warning. *A standardized surface feature built in or applied to walking surfaces or other elements to warn visually impaired people of hazards on a circulation path.*

Dwelling Unit. A single unit which provides a kitchen or food preparation area, in addition to rooms and spaces for living, bathing, sleeping, and the like. *Dwelling units include a single family home or a townhouse used as a transient group home; an apartment building used as a shelter; guestrooms in a hotel that provide sleeping accommodations and food preparation areas; and other similar facilities used on a transient basis. For purposes of these guidelines, use of the term "Dwelling Unit" does not imply the unit is used as a residence.*

Egress, Means of. *A continuous and unobstructed way of exit travel from any point in a building or facility to a public way. A means of egress comprises vertical and horizontal travel and may include intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, horizontal exits, courts and yards. An accessible means of egress is one that complies with these guidelines and does not include stairs, steps, or escalators. Areas of rescue assistance or evacuation elevators may be included as part of accessible means of egress.*

Element. *An architectural or mechanical component of a building, facility, space, or site, e.g., telephone, curb ramp, door, drinking fountain, seating, or water closet.*

Entrance. *Any access point to a building or portion of a building or facility used for the purpose of entering. An entrance includes the approach walk, the vertical access leading to the entrance platform, the entrance platform itself, vestibules if provided, the entry door(s) or gate(s), and the hardware of the entry door(s) or gate(s).*

Facility. *All or any portion of buildings, structures, site improvements, complexes, equipment, roads, walks, passageways, parking lots, or other real or personal property located on a site.*

Ground Floor. *Any occupiable floor less than one story above or below grade with direct access to grade. A building or facility always has at least one ground floor and may have more than one ground floor as where a split level entrance has been provided or where a building is built into a hillside.*

Mezzanine or Mezzanine Floor. *That portion of a story which is an intermediate floor level placed within the story and having occupiable space above and below its floor.*

Marked Crossing. A crosswalk or other identified path intended for pedestrian use in crossing a vehicular way.

Multifamily Dwelling. Any building containing more than two dwelling units.

Occupiable. *A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes, or in which occupants are engaged at labor, and which is equipped with means of egress, light, and ventilation.*

3.5 Definitions

Operable Part. A part of a piece of equipment or appliance used to insert or withdraw objects, or to activate, deactivate, or adjust the equipment or appliance (for example, coin slot, pushbutton, handle).

Path of Travel. *(Reserved).*

Power-assisted Door. A door used *for human passage* with a mechanism that helps to open the door, or relieves the opening resistance of a door, upon the activation of a switch or a continued force applied to the door itself.

Public Use. Describes interior or exterior rooms or spaces that are made available to the general public. Public use may be provided at a building or facility that is privately or publicly owned.

Ramp. A walking surface which has a running slope greater than 1:20.

Running Slope. The slope that is parallel to the direction of travel (see cross slope).

Service Entrance. An entrance intended primarily for delivery of goods or services.

Signage. *Displayed* verbal, symbolic, *tactile,* and pictorial information.

Site. A parcel of land bounded by a property line or a designated portion of a public right-of-way.

Site Improvement. Landscaping, paving for pedestrian and vehicular ways, outdoor lighting, recreational facilities, and the like, added to a site.

Sleeping Accommodations. Rooms in which people sleep; for example, dormitory and hotel or motel guest rooms or suites.

Space. *A definable area, e.g., room, toilet room, hall, assembly area, entrance, storage room, alcove, courtyard, or lobby.*

Story. *That portion of a building included between the upper surface of a floor and upper surface of the floor or roof next above. If such portion of a building does not include occupiable space, it is not considered a story for purposes of these guidelines. There may be more than one floor level within a story as in the case of a mezzanine or mezzanines.*

Structural Frame. The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and all other members which are essential to the stability of the building as a whole.

Tactile. Describes an object that can be perceived using the sense of touch.

Text Telephone. *Machinery or equipment that employs interactive graphic (i.e., typed) communications through the transmission of coded signals across the standard telephone network. Text telephones can include, for example, devices known as TDD's (telecommunication display devices or telecommunication devices for deaf persons) or computers.*

Transient Lodging. *A building, facility, or portion thereof, excluding inpatient medical care facilities, that contains one or more dwelling units or sleeping accommodations. Transient lodging may include, but is not limited to, resorts, group homes, hotels, motels, and dormitories.*

Vehicular Way. A route intended for vehicular traffic, such as a street, driveway, or parking lot.

Walk. An exterior pathway with a prepared surface intended for pedestrian use, including general pedestrian areas such as plazas and courts.

NOTE: Sections 4.1.1 through 4.1.7 are different from ANSI A117.1 in their entirety and are printed in standard type (ANSI A117.1 does not include scoping provisions).

4. ACCESSIBLE ELEMENTS AND SPACES: SCOPE AND TECHNICAL REQUIREMENTS.

4.1 Minimum Requirements

4.1.1* Application.

(1) General. All areas of newly designed or newly constructed buildings and facilities required to be accessible by 4.1.2 and 4.1.3 and altered portions of existing buildings and facilities required to be accessible by 4.1.6 shall comply with these guidelines, 4.1 through 4.35, unless otherwise provided in this section or as modified in a special application section.

(2) Application Based on Building Use. Special application sections 5 through 10 provide additional requirements for restaurants and cafeterias, medical care facilities, business and mercantile, libraries, accessible transient lodging, and transportation facilities. When a building or facility contains more than one use covered by a special application section, each portion shall comply with the requirements for that use.

(3)* Areas Used Only by Employees as Work Areas. Areas that are used only as work areas shall be designed and constructed so that individuals with disabilities can approach, enter, and exit the areas. These guidelines do not require that any areas used only as work areas be constructed to permit maneuvering within the work area or be constructed or equipped (i.e., with racks or shelves) to be accessible.

(4) Temporary Structures. These guidelines cover temporary buildings or facilities as well as permanent facilities. Temporary buildings and facilities are not of permanent construction but are extensively used or are essential for public use for a period of time. Examples of temporary buildings or facilities covered by these guidelines include, but are not limited to: reviewing stands, temporary classrooms, bleacher areas, exhibit areas, temporary banking facilities, temporary health screening services, or temporary safe pedestrian passageways around a construction site. Structures, sites and equipment directly associated with the actual processes of construction, such as scaffolding, bridging, materials hoists, or construction trailers are not included.

(5) General Exceptions.

(a) In new construction, a person or entity is not required to meet fully the requirements of these guidelines where that person or entity can demonstrate that it is structurally impracticable to do so. Full compliance will be considered structurally impracticable only in those rare circumstances when the unique characteristics of terrain prevent the incorporation of accessibility features. If full compliance with the requirements of these guidelines is structurally impracticable, a person or entity shall comply with the requirements to the extent it is not structurally impracticable. Any portion of the building or facility which can be made accessible shall comply to the extent that it is not structurally impracticable.

(b) Accessibility is not required to (i) observation galleries used primarily for security purposes; or (ii) in non-occupiable spaces accessed only by ladders, catwalks, crawl spaces, very narrow passageways, or freight (non-passenger) elevators, and frequented only by service personnel for repair purposes; such spaces include, but are not limited to, elevator pits, elevator penthouses, piping or equipment catwalks.

4.1.2 Accessible Sites and Exterior Facilities: New Construction.

An accessible site shall meet the following minimum requirements:

(1) At least one accessible route complying with 4.3 shall be provided within the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones if provided, and public streets or sidewalks, to an accessible building entrance.

(2) At least one accessible route complying with 4.3 shall connect accessible buildings, accessible facilities, accessible elements, and accessible spaces that are on the same site.

(3) All objects that protrude from surfaces or posts into circulation paths shall comply with 4.4.

4.1.2 Accessible Sites and Exterior Facilities: New Construction

(4) Ground surfaces along accessible routes and in accessible spaces shall comply with 4.5.

(5) (a) If parking spaces are provided for self-parking by employees or visitors, or both, then accessible spaces complying with 4.6 shall be provided in each such parking area in conformance with the table below. Spaces required by the table need not be provided in the particular lot. They may be provided in a different location if equivalent or greater accessibility, in terms of distance from an accessible entrance, cost and convenience is ensured.

Total Parking in Lot	Required Minimum Number of Accessible Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20 plus 1 for each 100 over 1000

Except as provided in (b), access aisles adjacent to accessible spaces shall be 60 in (1525 mm) wide minimum.

(b) One in every eight accessible spaces, but not less than one, shall be served by an access aisle 96 in (2440 mm) wide minimum and shall be designated "van accessible" as required by 4.6.4. The vertical clearance at such spaces shall comply with 4.6.5. All such spaces may be grouped on one level of a parking structure.

EXCEPTION: Provision of all required parking spaces in conformance with "Universal Parking Design" (see appendix A4.6.3) is permitted.

(c) If passenger loading zones are provided, then at least one passenger loading zone shall comply with 4.6.6.

(d) At facilities providing medical care and other services for persons with mobility impairments, parking spaces complying with 4.6 shall be provided in accordance with 4.1.2(5)(a) except as follows:

(i) Outpatient units and facilities: 10 percent of the total number of parking spaces provided serving each such outpatient unit or facility;

(ii) Units and facilities that specialize in treatment or services for persons with mobility impairments: 20 percent of the total number of parking spaces provided serving each such unit or facility.

(e)*Valet parking: Valet parking facilities shall provide a passenger loading zone complying with 4.6.6 located on an accessible route to the entrance of the facility. Paragraphs 5(a), 5(b), and 5(d) of this section do not apply to valet parking facilities.

(6) If toilet facilities are provided on a site, then each such public or common use toilet facility shall comply with 4.22. If bathing facilities are provided on a site, then each such public or common use bathing facility shall comply with 4.23.

For single user portable toilet or bathing units clustered at a single location, at least 5% but no less than one toilet unit or bathing unit complying with 4.22 or 4.23 shall be installed at each cluster whenever typical inaccessible units are provided. Accessible units shall be identified by the International Symbol of Accessibility.

EXCEPTION: Portable toilet units at construction sites used exclusively by construction personnel are not required to comply with 4.1.2(6).

(7) Building Signage. Signs which designate permanent rooms and spaces shall comply with 4.30.1, 4.30.4, 4.30.5 and 4.30.6. Other signs which provide direction to, or information about, functional spaces of the building shall comply with 4.30.1, 4.30.2, 4.30.3, and 4.30.5. Elements and spaces of accessible facilities which shall be identified by the International Symbol of Accessibility and which shall comply with 4.30.7 are:

(a) Parking spaces designated as reserved for individuals with disabilities;

(b) Accessible passenger loading zones;

(c) Accessible entrances when not all are accessible (inaccessible entrances shall have directional signage to indicate the route to the nearest accessible entrance);

(d) Accessible toilet and bathing facilities when not all are accessible.

69.18

4.1.3 Accessible Buildings: New Construction. Accessible buildings and facilities shall meet the following minimum requirements:

69.18 (1m)

(1) At least one accessible route complying with 4.3 shall connect accessible building or facility entrances with all accessible spaces and elements within the building or facility.

(2) All objects that overhang or protrude into circulation paths shall comply with 4.4.

(3) Ground and floor surfaces along accessible routes and in accessible rooms and spaces shall comply with 4.5.

(4) Interior and exterior stairs connecting levels that are not connected by an elevator, ramp, or other accessible means of vertical access shall comply with 4.9.

69.18 (2)

(5)* One passenger elevator complying with 4.10 shall serve each level, including mezzanines, in all multi-story buildings and facilities unless exempted below. If more than one elevator is provided, each full passenger elevator shall comply with 4.10.

EXCEPTION 1: Elevators are not required in facilities that are less than three stories or that have less than 3000 square feet per story unless the building is a shopping center, a shopping mall, or the professional office of a health care provider, or another type of facility as determined by the Attorney General. The elevator exemption set forth in this paragraph does not obviate or limit in any way the obligation to comply with the other accessibility requirements established in section 4.1.3. For example, floors above or below the accessible ground floor must meet the requirements of this section except for elevator service. If toilet or bathing facilities are provided on a level not served by an elevator, then toilet or bathing facilities must be provided on the accessible ground floor. In new construction if a building or facility is eligible for this exemption but a full passenger elevator is nonetheless planned, that elevator shall meet the requirements of 4.10 and shall serve each level in the building. A full passenger elevator that provides service from a garage to only one level of a building or facility is not required to serve other levels.

EXCEPTION 2: Elevator pits, elevator penthouses, mechanical rooms, piping or equipment catwalks are exempted from this requirement.

EXCEPTION 3: Accessible ramps complying with 4.8 may be used in lieu of an elevator.

EXCEPTION 4: Platform lifts (wheelchair lifts) complying with 4.11 of this guideline and applicable state or local codes may be used in lieu of an elevator only under the following conditions:

(a) To provide an accessible route to a performing area in an assembly occupancy.

(b) To comply with the wheelchair viewing position line-of-sight and dispersion requirements of 4.33.3.

(c) To provide access to incidental occupiable spaces and rooms which are not open to the general public and which house no more than five persons, including but not limited to equipment control rooms and projection booths.

(d) To provide access where existing site constraints or other constraints make use of a ramp or an elevator infeasible.

(6) Windows: (Reserved).

(7) Doors:

(a) At each accessible entrance to a building or facility, at least one door shall comply with 4.13.

(b) Within a building or facility, at least one door at each accessible space shall comply with 4.13.

(c) Each door that is an element of an accessible route shall comply with 4.13.

4.1.3 Accessible Buildings: New Construction

(d) Each door required by 4.3.10, Egress, shall comply with 4.13.

(8) In new construction, at a minimum, the requirements in (a) and (b) below shall be satisfied independently:

(a)(i) At least 50% of all public entrances (excluding those in (b) below) must be accessible. At least one must be a ground floor entrance. Public entrances are any entrances that are not loading or service entrances.

(ii) Accessible entrances must be provided in a number at least equivalent to the number of exits required by the applicable building/fire codes. (This paragraph does not require an increase in the total number of entrances planned for a facility.)

(iii) An accessible entrance must be provided to each tenancy in a facility (for example, individual stores in a strip shopping center).

One entrance may be considered as meeting more than one of the requirements in (a). Where feasible, accessible entrances shall be the entrances used by the majority of people visiting or working in the building.

(b)(i) In addition, if direct access is provided for pedestrians from an enclosed parking garage to the building, at least one direct entrance from the garage to the building must be accessible.

(ii) If access is provided for pedestrians from a pedestrian tunnel or elevated walkway, one entrance to the building from each tunnel or walkway must be accessible.

One entrance may be considered as meeting more than one of the requirements in (b).

Because entrances also serve as emergency exits whose proximity to all parts of buildings and facilities is essential, it is preferable that all entrances be accessible.

(c) If the only entrance to a building, or tenancy in a facility, is a service entrance, that entrance shall be accessible.

(d) Entrances which are not accessible shall have directional signage complying with 4.30.1, 4.30.2, 4.30.3, and 4.30.5, which indicates the location of the nearest accessible entrance.

(9)* In buildings or facilities, or portions of buildings or facilities, required to be accessible, accessible means of egress shall be provided in the same number as required for exits by local building/life safety regulations. Where a required exit from an occupiable level above or below a level of accessible exit discharge is not accessible, an area of rescue assistance shall be provided on each such level (in a number equal to that of inaccessible required exits). Areas of rescue assistance shall comply with 4.3.11. A horizontal exit, meeting the requirements of local building/life safety regulations, shall satisfy the requirement for an area of rescue assistance.

EXCEPTION: Areas of rescue assistance are not required in buildings or facilities having a supervised automatic sprinkler system.

(10)* Drinking Fountains:

(a) Where only one drinking fountain is provided on a floor there shall be a drinking fountain which is accessible to individuals who use wheelchairs in accordance with 4.15 and one accessible to those who have difficulty bending or stooping. (This can be accommodated by the use of a "hi-lo" fountain; by providing one fountain accessible to those who use wheelchairs and one fountain at a standard height convenient for those who have difficulty bending; by providing a fountain accessible under 4.15 and a water cooler; or by such other means as would achieve the required accessibility for each group on each floor.)

(b) Where more than one drinking fountain or water cooler is provided on a floor, 50% of those provided shall comply with 4.15 and shall be on an accessible route.

(11) Toilet Facilities: If toilet rooms are provided, then each public and common use toilet room shall comply with 4.22. Other toilet rooms provided for the use of occupants of specific spaces (i.e., a private toilet room for the occupant of a private office) shall be adaptable. If bathing rooms are provided, then each public and common use bathroom shall comply with 4.23. Accessible toilet rooms and bathing facilities shall be on an accessible route.

69.19 (3)

69.18 (3)(b)

69.18 (4)

(12) Storage, Shelving and Display Units:

(a) If fixed or built-in storage facilities such as cabinets, shelves, closets, and drawers are provided in accessible spaces, at least one of each type provided shall contain storage space complying with 4.25. Additional storage may be provided outside of the dimensions required by 4.25.

(b) Shelves or display units allowing self-service by customers in mercantile occupancies shall be located on an accessible route complying with 4.3. Requirements for accessible reach range do not apply.

(13) Controls and operating mechanisms in accessible spaces, along accessible routes, or as parts of accessible elements (for example, light switches and dispenser controls) shall comply with 4.27.

(14) If emergency warning systems are provided, then they shall include both audible alarms and visual alarms complying with 4.28. Sleeping accommodations required to comply with 9.3 shall have an alarm system complying with 4.28. Emergency warning systems in medical care facilities may be modified to suit standard health care alarm design practice.

(15) Detectable warnings shall be provided at locations as specified in 4.29.

(16) Building Signage:

(a) Signs which designate permanent rooms and spaces shall comply with 4.30.1, 4.30.4, 4.30.5 and 4.30.6.

(b) Other signs which provide direction to or information about functional spaces of the building shall comply with 4.30.1, 4.30.2, 4.30.3, and 4.30.5.

EXCEPTION: Building directories, menus, and all other signs which are temporary are not required to comply.

(17) Public Telephones:

(a) If public pay telephones, public closed circuit telephones, or other public telephones are provided, then they shall comply with 4.31.2 through 4.31.8 to the extent required by the following table:

Number of each type of telephone provided on each floor	Number of telephones required to comply with 4.31.2 through 4.31.8[1]
1 or more single unit	1 per floor
1 bank[2]	1 per floor
2 or more banks[2]	1 per bank. Accessible unit may be installed as a single unit in proximity (either visible or with signage) to the bank. At least one public telephone per floor shall meet the requirements for a forward reach telephone[3].

[1] Additional public telephones may be installed at any height. Unless otherwise specified, accessible telephones may be either forward or side reach telephones.

[2] A bank consists of two or more adjacent public telephones, often installed as a unit.

[3] EXCEPTION: For exterior installations only, if dial tone first service is available, then a side reach telephone may be installed instead of the required forward reach telephone (i.e., one telephone in proximity to each bank shall comply with 4.31).

(b)* All telephones required to be accessible and complying with 4.31.2 through 4.31.8 shall be equipped with a volume control. In addition, 25 percent, but never less than one, of all other public telephones provided shall be equipped with a volume control and shall be dispersed among all types of public telephones, including closed circuit telephones, throughout the building or facility. Signage complying with applicable provisions of 4.30.7 shall be provided.

(c) The following shall be provided in accordance with 4.31.9:

(i) If a total number of four or more public pay telephones (including both interior and exterior phones) is provided at a site, and at least one is in an interior location, then at least one interior public text telephone shall be provided.

(ii) If an interior public pay telephone is provided in a stadium or arena, in a convention center, in a hotel with a convention center, or

4.1.3 Accessible Buildings: New Construction

in a covered mall, at least one interior public text telephone shall be provided in the facility.

(iii) if a public pay telephone is located in or adjacent to a hospital emergency room, hospital recovery room, or hospital waiting room, one public text telephone shall be provided at each such location.

(d) Where a bank of telephones in the interior of a building consists of three or more public pay telephones, at least one public pay telephone in each such bank shall be equipped with a shelf and outlet in compliance with 4.31.9(2).

(18) If fixed or built-in seating or tables (including, but not limited to, study carrels and student laboratory stations), are provided in accessible public or common use areas, at least five percent (5%), but not less than one, of the fixed or built-in seating areas or tables shall comply with 4.32. An accessible route shall lead to and through such fixed or built-in seating areas, or tables.

(19)* Assembly areas:

(a) In places of assembly with fixed seating accessible wheelchair locations shall comply with 4.33.2, 4.33.3, and 4.33.4 and shall be provided consistent with the following table:

Capacity of Seating in Assembly Areas	Number of Required Wheelchair Locations
4 to 25	1
26 to 50	2
51 to 300	4
301 to 500	6
over 500	6, plus 1 additional space for each total seating capacity increase of 100

In addition, one percent, but not less than one, of all fixed seats shall be aisle seats with no armrests on the aisle side, or removable or folding armrests on the aisle side. Each such seat shall be identified by a sign or marker. Signage notifying patrons of the availability of such seats shall be posted at the ticket office. Aisle seats are not required to comply with 4.33.4.

(b) This paragraph applies to assembly areas where audible communications are integral to the use of the space (e.g., concert and lecture halls, playhouses and movie theaters, meeting rooms, etc.). Such assembly areas, if (1) they accommodate at least 50 persons, or if they have audio-amplification systems, and (2) they have fixed seating, shall have a permanently installed assistive listening system complying with 4.33. For other assembly areas, a permanently installed assistive listening system, or an adequate number of electrical outlets or other supplementary wiring necessary to support a portable assistive listening system shall be provided. The minimum number of receivers to be provided shall be equal to 4 percent of the total number of seats, but in no case less than two. Signage complying with applicable provisions of 4.30 shall be installed to notify patrons of the availability of a listening system.

(20) Where automated teller machines (ATMs) are provided, each ATM shall comply with the requirements of 4.34 except where two or more are provided at a location, then only one must comply.

EXCEPTION: Drive-up-only automated teller machines are not required to comply with 4.27.2, 4.27.3 and 4.34.3.

(21) Where dressing and fitting rooms are provided for use by the general public, patients, customers or employees, 5 percent, but never less than one, of dressing rooms for each type of use in each cluster of dressing rooms shall be accessible and shall comply with 4.35.

Examples of types of dressing rooms are those serving different genders or distinct and different functions as in different treatment or examination facilities.

4.1.4 (Reserved).

4.1.5 Accessible Buildings: Additions. Each addition to an existing building or facility shall be regarded as an alteration. Each space or element added to the existing building or facility shall comply with the applicable provisions of 4.1.1 to 4.1.3, Minimum Requirements (for New Construction) and the applicable technical specifications of 4.2 through 4.35 and sections 5 through 10. Each addition that

affects or could affect the usability of an area containing a primary function shall comply with 4.1.6(2).

4.1.6 Accessible Buildings: Alterations.

(1) General. Alterations to existing buildings and facilities shall comply with the following:

(a) No alteration shall be undertaken which decreases or has the effect of decreasing accessibility or usability of a building or facility below the requirements for new construction at the time of alteration.

(b) If existing elements, spaces, or common areas are altered, then each such altered element, space, feature, or area shall comply with the applicable provisions of 4.1.1 to 4.1.3 Minimum Requirements (for New Construction). If the applicable provision for new construction requires that an element, space, or common area be on an accessible route, the altered element, space, or common area is not required to be on an accessible route except as provided in 4.1.6(2) (Alterations to an Area Containing a Primary Function.)

(c) If alterations of single elements, when considered together, amount to an alteration of a room or space in a building or facility, the entire space shall be made accessible.

(d) No alteration of an existing element, space, or area of a building or facility shall impose a requirement for greater accessibility than that which would be required for new construction. For example, if the elevators and stairs in a building are being altered and the elevators are, in turn, being made accessible, then no accessibility modifications are required to the stairs connecting levels connected by the elevator. If stair modifications to correct unsafe conditions are required by other codes, the modifications shall be done in compliance with these guidelines unless technically infeasible.

(e) At least one interior public text telephone complying with 4.31.9 shall be provided if:

(i) alterations to existing buildings or facilities with less than four exterior or interior public pay telephones would increase the total number to four or more telephones with at least one in an interior location; or

(ii) alterations to one or more exterior or interior public pay telephones occur in an existing building or facility with four or more public telephones with at least one in an interior location.

(f) If an escalator or stair is planned or installed where none existed previously and major structural modifications are necessary for such installation, then a means of accessible vertical access shall be provided that complies with the applicable provisions of 4.7, 4.8, 4.10, or 4.11.

(g) In alterations, the requirements of 4.1.3(9), 4.3.10 and 4.3.11 do not apply.

(h)*Entrances: If a planned alteration entails alterations to an entrance, and the building has an accessible entrance, the entrance being altered is not required to comply with 4.1.3(8), except to the extent required by 4.1.6(2). If a particular entrance is not made accessible, appropriate accessible signage indicating the location of the nearest accessible entrance(s) shall be installed at or near the inaccessible entrance, such that a person with disabilities will not be required to retrace the approach route from the inaccessible entrance.

(i) If the alteration work is limited solely to the electrical, mechanical, or plumbing system, or to hazardous material abatement, or automatic sprinkler retrofitting, and does not involve the alteration of any elements or spaces required to be accessible under these guidelines, then 4.1.6(2) does not apply.

(j) EXCEPTION: In alteration work, if compliance with 4.1.6 is technically infeasible, the alteration shall provide accessibility to the maximum extent feasible. Any elements or features of the building or facility that are being altered and can be made accessible shall be made accessible within the scope of the alteration.

Technically Infeasible. Means, with respect to an alteration of a building or a facility, that it has little likelihood of being accomplished because existing structural conditions would require removing or altering a load-bearing member which is an essential part of the structural frame; or because other existing physical or site constraints prohibit modification or

4.1.6 Accessible Buildings: Alterations

addition of elements, spaces, or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility.

(k) EXCEPTION:

69.20 (1)

(i) These guidelines do not require the installation of an elevator in an altered facility that is less than three stories or has less than 3,000 square feet per story unless the building is a shopping center, a shopping mall, the professional office of a health care provider, or another type of facility as determined by the Attorney General.

(ii) The exemption provided in paragraph (i) does not obviate or limit in any way the obligation to comply with the other accessibility requirements established in these guidelines. For example, alterations to floors above or below the ground floor must be accessible regardless of whether the altered facility has an elevator. If a facility subject to the elevator exemption set forth in paragraph (i) nonetheless has a full passenger elevator, that elevator shall meet, to the maximum extent feasible, the accessibility requirements of these guidelines.

69.20 (2)

(2) Alterations to an Area Containing a Primary Function: In addition to the requirements of 4.1.6(1), an alteration that affects or could affect the usability of or access to an area containing a primary function shall be made so as to ensure that, to the maximum extent feasible, the path of travel to the altered area and the restrooms, telephones, and drinking fountains serving the altered area, are readily accessible to and usable by individuals with disabilities, unless such alterations are disproportionate to the overall alterations in terms of cost and scope (as determined under criteria established by the Attorney General).

69.20 (3)

(3) Special Technical Provisions for Alterations to Existing Buildings and Facilities:

(a) Ramps: Curb ramps and interior or exterior ramps to be constructed on sites or in existing buildings or facilities where space limitations prohibit the use of a 1:12 slope or less may have slopes and rises as follows:

(i) A slope between 1:10 and 1:12 is allowed for a maximum rise of 6 inches.

(ii) A slope between 1:8 and 1:10 is allowed for a maximum rise of 3 inches. A slope steeper than 1:8 is not allowed.

(b) Stairs: Full extension of handrails at stairs shall not be required in alterations where such extensions would be hazardous or impossible due to plan configuration.

(c) Elevators:

(i) If safety door edges are provided in existing automatic elevators, automatic door reopening devices may be omitted (see 4.10.6).

(ii) Where existing shaft configuration or technical infeasibility prohibits strict compliance with 4.10.9, the minimum car plan dimensions may be reduced by the minimum amount necessary, but in no case shall the inside car area be smaller than 48 in by 48 in.

(iii) Equivalent facilitation may be provided with an elevator car of different dimensions when usability can be demonstrated and when all other elements required to be accessible comply with the applicable provisions of 4.10. For example, an elevator of 47 in by 69 in (1195 mm by 1755 mm) with a door opening on the narrow dimension, could accommodate the standard wheelchair clearances shown in Figure 4.

(d) Doors:

(i) Where it is technically infeasible to comply with clear opening width requirements of 4.13.5, a projection of 5/8 in maximum will be permitted for the latch side stop.

(ii) If existing thresholds are 3/4 in high or less, and have (or are modified to have) a beveled edge on each side, they may remain.

(e) Toilet Rooms:

(i) Where it is technically infeasible to comply with 4.22 or 4.23, the installation of at least one unisex toilet/bathroom per floor, located in the same area as existing toilet facilities, will be permitted in lieu of modifying existing toilet facilities to be accessible. Each unisex toilet room shall contain one water closet complying with 4.16 and one lavatory complying with 4.19, and the door shall have a privacy latch.

(ii) Where it is technically infeasible to install a required standard stall (Fig. 30(a)), or where other codes prohibit reduction of the fixture count (i.e., removal of a water closet in order to create a double-wide stall), either alternate stall (Fig.30(b)) may be provided in lieu of the standard stall.

(iii) When existing toilet or bathing facilities are being altered and are not made accessible, signage complying with 4.30.1, 4.30.2, 4.30.3, 4.30.5, and 4.30.7 shall be provided indicating the location of the nearest accessible toilet or bathing facility within the facility.

(f) Assembly Areas:

(i) Where it is technically infeasible to disperse accessible seating throughout an altered assembly area, accessible seating areas may be clustered. Each accessible seating area shall have provisions for companion seating and shall be located on an accessible route that also serves as a means of emergency egress.

(ii) Where it is technically infeasible to alter all performing areas to be on an accessible route, at least one of each type of performing area shall be made accessible.

(g) Platform Lifts (Wheelchair Lifts): In alterations, platform lifts (wheelchair lifts) complying with 4.11 and applicable state or local codes may be used as part of an accessible route. The use of lifts is not limited to the four conditions in exception 4 of 4.1.3(5).

(h) Dressing Rooms: In alterations where technical infeasibility can be demonstrated, one dressing room for each sex on each level shall be made accessible. Where only unisex dressing rooms are provided, accessible unisex dressing rooms may be used to fulfill this requirement.

4.1.7 Accessible Buildings: Historic Preservation.

(1) Applicability:

(a) General Rule. Alterations to a qualified historic building or facility shall comply with 4.1.6 Accessible Buildings: Alterations, the applicable technical specifications of 4.2 through 4.35 and the applicable special application sections 5 through 10 unless it is determined in accordance with the procedures in 4.1.7(2) that compliance with the requirements for accessible routes (exterior and interior), ramps, entrances, or toilets would threaten or destroy the historic significance of the building or facility in which case the alternative requirements in 4.1.7(3) may be used for the feature.

EXCEPTION: (Reserved).

(b) Definition. A qualified historic building or facility is a building or facility that is:

(i) Listed in or eligible for listing in the National Register of Historic Places; or

(ii) Designated as historic under an appropriate State or local law.

(2) Procedures:

(a) Alterations to Qualified Historic Buildings and Facilities Subject to Section 106 of the National Historic Preservation Act:

(i) Section 106 Process. Section 106 of the National Historic Preservation Act (16 U.S.C. 470 f) requires that a Federal agency with jurisdiction over a Federal, federally assisted, or federally licensed undertaking consider the effects of the agency's undertaking on buildings and facilities listed in or eligible for listing in the National Register of Historic Places and give the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking prior to approval of the undertaking.

(ii) ADA Application. Where alterations are undertaken to a qualified historic building or facility that is subject to section 106 of the National Historic Preservation Act, the Federal agency with jurisdiction over the undertaking shall follow the section 106 process. If the State Historic Preservation Officer or Advisory Council on Historic Preservation agrees that compliance with the requirements for accessible routes (exterior and interior), ramps, entrances, or toilets would threaten or destroy the historic significance of the building or facility, the alternative requirements in 4.1.7(3) may be used for the feature.

4.2 Space Allowance and Reach Ranges

(b) Alterations to Qualified Historic Buildings and Facilities Not Subject to Section 106 of the National Historic Preservation Act. Where alterations are undertaken to a qualified historic building or facility that is not subject to section 106 of the National Historic Preservation Act, if the entity undertaking the alterations believes that compliance with the requirements for accessible routes (exterior and interior), ramps, entrances, or toilets would threaten or destroy the historic significance of the building or facility and that the alternative requirements in 4.1.7(3) should be used for the feature, the entity should consult with the State Historic Preservation Officer. If the State Historic Preservation Officer agrees that compliance with the accessibility requirements for accessible routes (exterior and interior), ramps, entrances or toilets would threaten or destroy the historical significance of the building or facility, the alternative requirements in 4.1.7(3) may be used.

(c) Consultation With Interested Persons. Interested persons should be invited to participate in the consultation process, including State or local accessibility officials, individuals with disabilities, and organizations representing individuals with disabilities.

(d) Certified Local Government Historic Preservation Programs. Where the State Historic Preservation Officer has delegated the consultation responsibility for purposes of this section to a local government historic preservation program that has been certified in accordance with section 101(c) of the National Historic Preservation Act of 1966 (16 U.S.C. 470a (c)) and implementing regulations (36 CFR 61.5), the responsibility may be carried out by the appropriate local government body or official.

(3) Historic Preservation: Minimum Requirements:

(a) At least one accessible route complying with 4.3 from a site access point to an accessible entrance shall be provided.

EXCEPTION: A ramp with a slope no greater than 1:6 for a run not to exceed 2 ft (610 mm) may be used as part of an accessible route to an entrance.

(b) At least one accessible entrance complying with 4.14 which is used by the public shall be provided.

EXCEPTION: If it is determined that no entrance used by the public can comply with 4.14, then access at any entrance not used by the general public but open (unlocked) with directional signage at the primary entrance may be used. The accessible entrance shall also have a notification system. Where security is a problem, remote monitoring may be used.

(c) If toilets are provided, then at least one toilet facility complying with 4.22 and 4.1.6 shall be provided along an accessible route that complies with 4.3. Such toilet facility may be unisex in design.

(d) Accessible routes from an accessible entrance to all publicly used spaces on at least the level of the accessible entrance shall be provided. Access shall be provided to all levels of a building or facility in compliance with 4.1 whenever practical.

(e) Displays and written information, documents, etc., should be located where they can be seen by a seated person. Exhibits and signage displayed horizontally (e.g., open books), should be no higher than 44 in (1120 mm) above the floor surface.

NOTE: The technical provisions of sections 4.2 through 4.35 are the same as those of the American National Standard Institute's document A117.1-1980, except as noted in the text.

4.2 Space Allowance and Reach Ranges.

4.2.1* Wheelchair Passage Width. The minimum clear width for single wheelchair passage shall be 32 in (815 mm) at a point and 36 in (915 mm) continuously (see Fig. 1 and 24(e)).

4.2.2 Width for Wheelchair Passing. The minimum width for two wheelchairs to pass is 60 in (1525 mm) (see Fig. 2).

4.2.3* Wheelchair Turning Space. The space required for a wheelchair to make a 180-degree turn is a clear space of 60 in (1525 mm)

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diameter (see Fig. 3(a)) or a T-shaped space (see Fig. 3(b)).

4.2.4* Clear Floor or Ground Space for Wheelchairs.

4.2.4.1 Size and Approach. The minimum clear floor or ground space required to accommodate a single, stationary wheelchair and occupant is 30 in by 48 in (760 mm by 1220 mm) (see Fig. 4(a)). The minimum clear floor or ground space for wheelchairs may be positioned for forward or parallel approach to an object (see Fig. 4(b) and (c)). Clear floor or ground space for wheelchairs may be part of the knee space required under some objects.

4.2.4.2 Relationship of Maneuvering Clearance to Wheelchair Spaces. One full unobstructed side of the clear floor or ground space for a wheelchair shall adjoin or overlap an accessible route or adjoin another wheelchair clear floor space. If a clear floor space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearances shall be provided as shown in Fig. 4(d) and (e).

4.2.4.3 Surfaces for Wheelchair Spaces. Clear floor or ground spaces for wheelchairs shall comply with 4.5.

4.2.5* Forward Reach. If the clear floor space only allows forward approach to an object, the maximum high forward reach allowed shall be 48 in (1220 mm) (see Fig. 5(a)). *The minimum low forward reach is 15 in (380 mm).* If the high forward reach is over an obstruction, reach and clearances shall be as shown in Fig. 5(b).

4.2.6* Side Reach. If the clear floor space allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall be 54 in (1370 mm) and the low side reach shall be no less than 9 in (230 mm) above the floor (Fig. 6(a) and (b)). If the side reach is over an obstruction, the reach and clearances shall be as shown in Fig 6(c).

4.3 Accessible Route.

4.3.1* General. All walks, halls, corridors, aisles, *skywalks, tunnels,* and other spaces

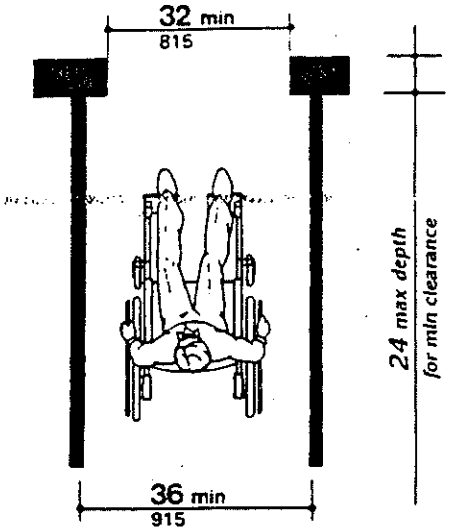


Fig. 1
Minimum Clear Width
for Single Wheelchair

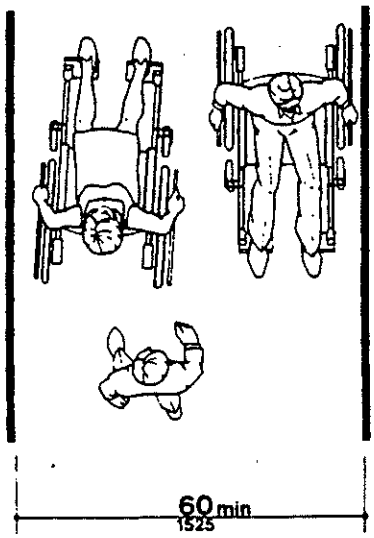


Fig. 2
Minimum Clear Width
for Two Wheelchairs

4.3 Accesssible Route

that are part of an accessible route shall comply with 4.3.

4.3.2 Location.

(1) At least one accessible route *within the boundary of the site* shall be provided from public transportation stops, accessible parking, and accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance they serve. *The accessible route shall, to the maximum extent feasible, coincide with the route for the general public.*

(2) At least one accessible route shall connect accessible buildings, facilities, elements, and spaces that are on the same site.

(3) At least one accessible route shall connect accessible building or facility entrances with all accessible spaces and elements and with all accessible dwelling units within the building or facility.

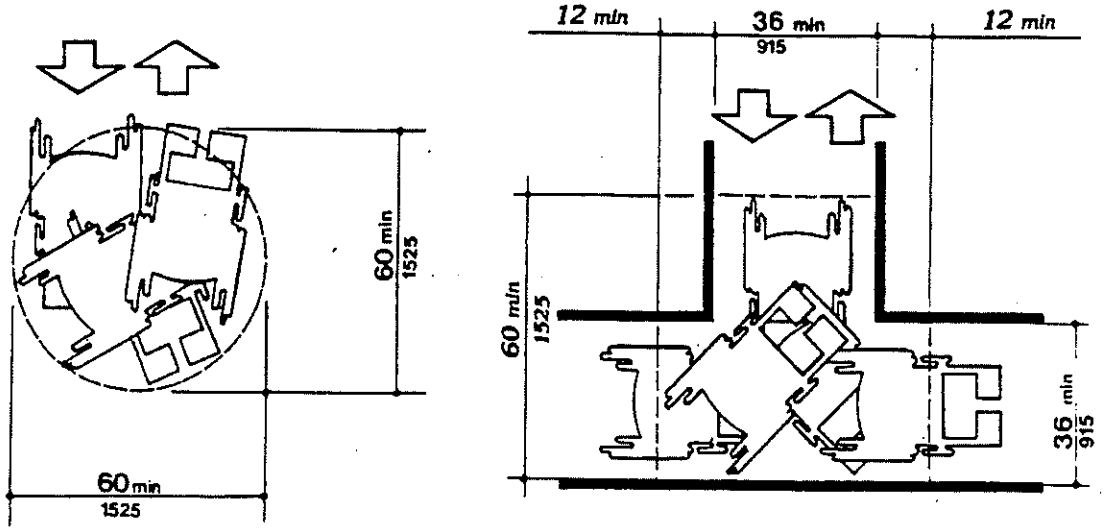
(4) An accessible route shall connect at least one accessible entrance of each accessible dwelling unit with those exterior and interior spaces and facilities that serve the accessible dwelling unit.

4.3.3 Width. The minimum clear width of an accessible route shall be 36 in (915 mm) except at doors (see 4.13.5 and 4.13.6). If a person in a wheelchair must make a turn around an obstruction, the minimum clear width of the accessible route shall be as shown in Fig. 7(a) and (b).

4.3.4 Passing Space. If an accessible route has less than 60 in (1525 mm) clear width, then passing spaces at least 60 in by 60 in (1525 mm by 1525 mm) shall be located at reasonable intervals not to exceed 200 ft (61 m). A T-intersection of two corridors or walks is an acceptable passing place.

4.3.5 Head Room. Accessible routes shall comply with 4.4.2.

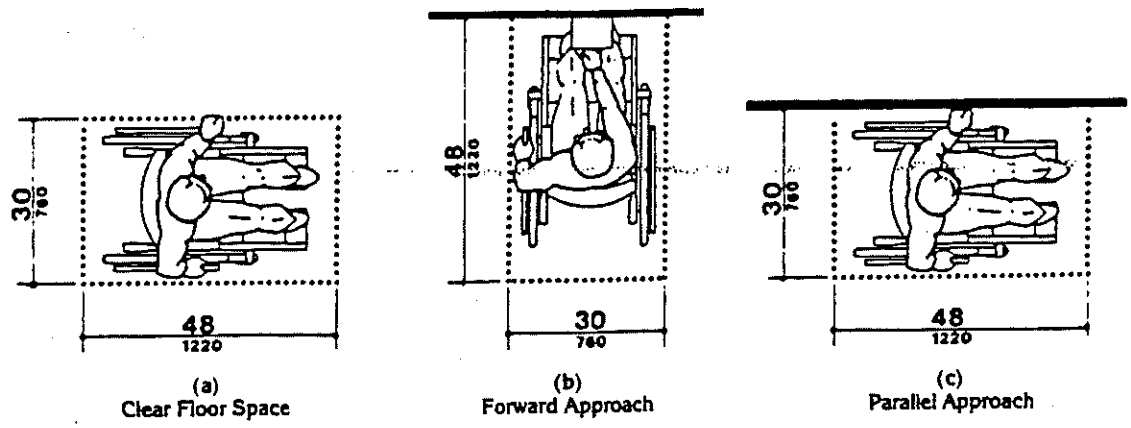
4.3.6 Surface Textures. The surface of an accessible route shall comply with 4.5.

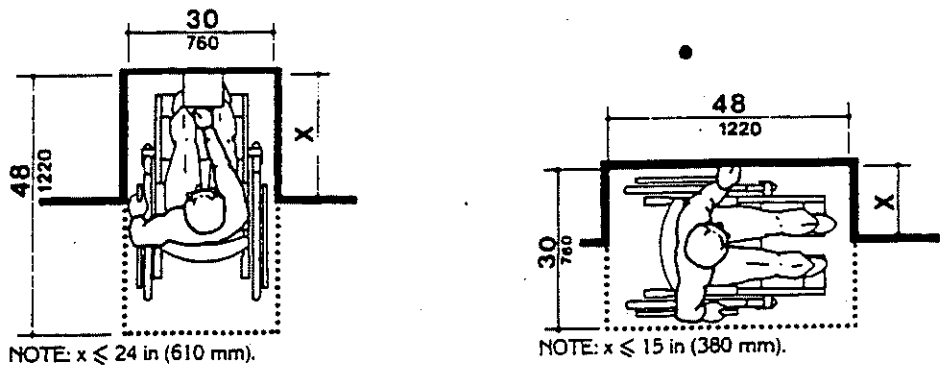


(a)
60-in (1525-mm)-Diameter Space

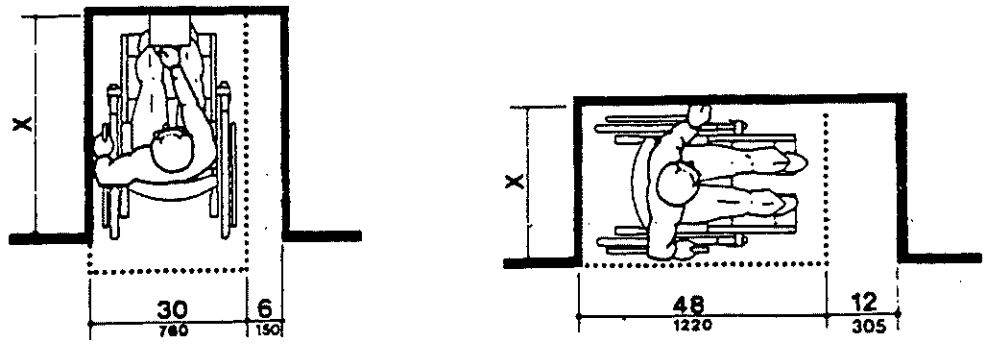
(b)
T-Shaped Space for 180° Turns

Fig. 3
Wheelchair Turning Space





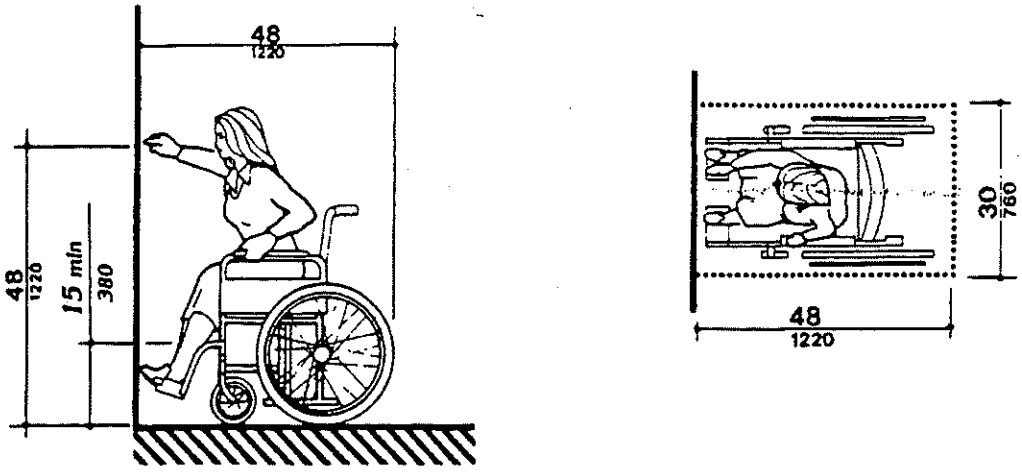
(d)
Clear Floor Space in Alcoves



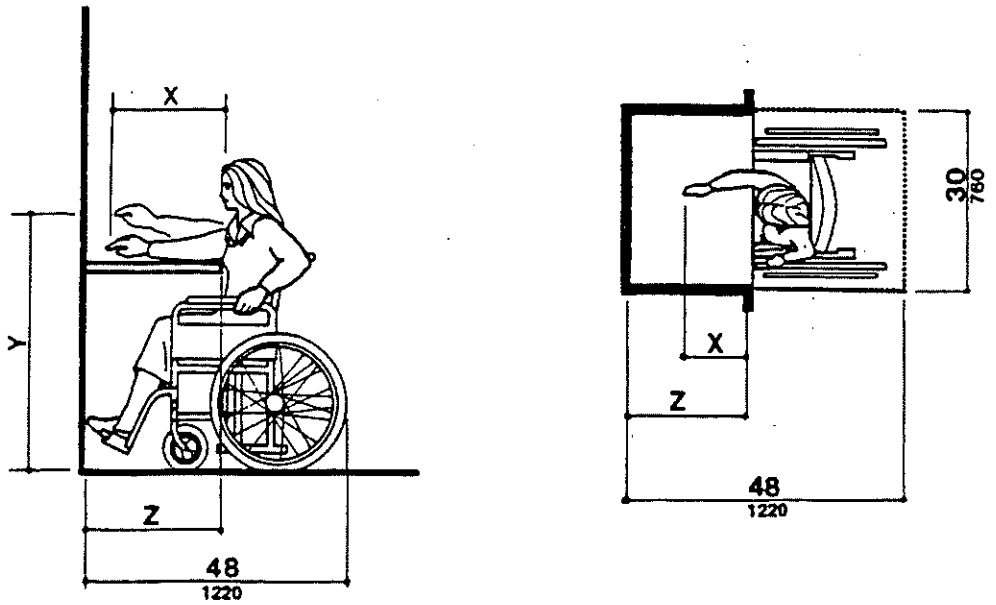
(e)
Additional Maneuvering Clearances for Alcoves

Fig. 4
Minimum Clear Floor Space for Wheelchairs

4.3 Accessible Route



(a)
High Forward Reach Limit



NOTE: x shall be ⩽ 25 in (635 mm); z shall be ⩾ x. When x < 20 in (510 mm), then y shall be 48 in (1220 mm) maximum. When x is 20 to 25 in (510 to 635 mm), then y shall be 44 in (1120 mm) maximum.

(b)
Maximum Forward Reach over an Obstruction

Fig. 5
Forward Reach

4.3.7 Slope

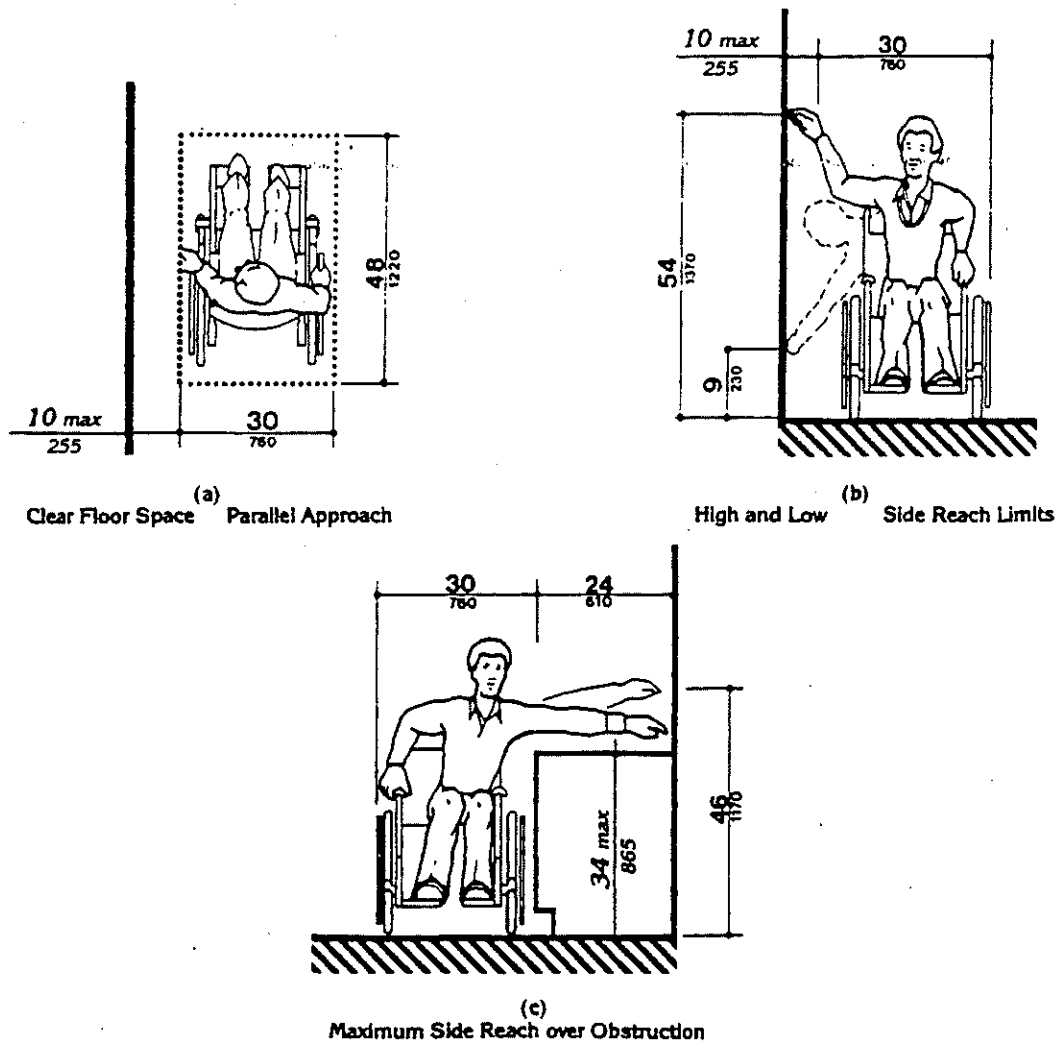


Fig. 6
Side Reach

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(2)

4.3.7 Slope. An accessible route with a running slope greater than 1:20 is a ramp and shall comply with 4.8. Nowhere shall the cross slope of an accessible route exceed 1:50.

4.3.8 Changes in Levels. Changes in levels along an accessible route shall comply with 4.5.2. If an accessible route has changes in level greater than 1/2 in (13 mm), then a curb ramp, ramp, elevator, or platform lift *(as permitted in 4.1.3 and 4.1.6)* shall be provided that complies with 4.7, 4.8, 4.10, or 4.11, respectively. An accessible route does not include stairs, steps, or escalators. See definition of "egress, means of" in 3.5.

4.3.9 Doors. Doors along an accessible route shall comply with 4.13.

4.3.10* Egress

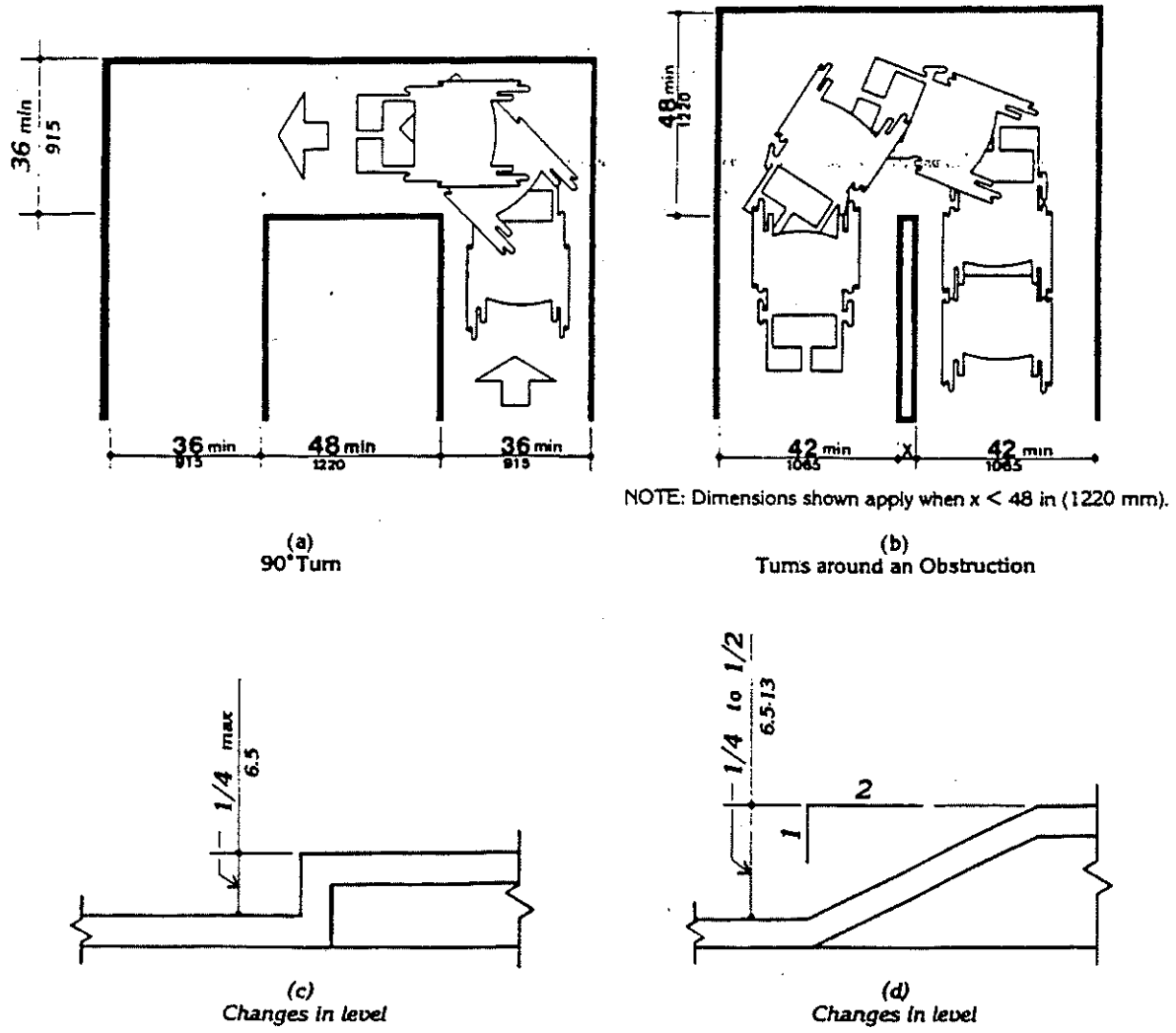


Fig. 7
Accessible Route

4.3.10* Egress. Accessible routes serving any accessible space or element shall also serve as a means of egress for emergencies or connect to an accessible area of *rescue assistance.*

4.3.11 Areas of Rescue Assistance.

4.3.11.1 Location and Construction. *An area of rescue assistance shall be one of the following:*

(1) A portion of a stairway landing within a smokeproof enclosure (complying with local requirements).

(2) A portion of an exterior exit balcony located immediately adjacent to an exit stairway when the balcony complies with local requirements for exterior exit balconies. Openings to the interior of the building located within 20 feet (6 m) of the

area of rescue assistance shall be protected with fire assemblies having a three-fourths hour fire protection rating.

(3) A portion of a one-hour fire-resistive corridor (complying with local requirements for fire-resistive construction and for openings) located immediately adjacent to an exit enclosure.

(4) A vestibule located immediately adjacent to an exit enclosure and constructed to the same fire-resistive standards as required for corridors and openings.

(5) A portion of a stairway landing within an exit enclosure which is vented to the exterior and is separated from the interior of the building with not less than one-hour fire-resistive doors.

(6) When approved by the appropriate local authority, an area or a room which is separated from other portions of the building by a smoke barrier. Smoke barriers shall have a fire-resistive rating of not less than one hour and shall completely enclose the area or room. Doors in the smoke barrier shall be tight-fitting smoke- and draft-control assemblies having a fire-protection rating of not less than 20 minutes and shall be self-closing or automatic closing. The area or room shall be provided with an exit directly to an exit enclosure. Where the room or area exits into an exit enclosure which is required to be of more than one-hour fire-resistive construction, the room or area shall have the same fire-resistive construction, including the same opening protection, as required for the adjacent exit enclosure.

(7) An elevator lobby when elevator shafts and adjacent lobbies are pressurized as required for smokeproof enclosures by local regulations and when complying with requirements herein for size, communication, and signage. Such pressurization system shall be activated by smoke detectors on each floor located in a manner approved by the appropriate local authority. Pressurization equipment and its duct work within the building shall be separated from other portions of the building by a minimum two-hour fire-resistive construction.

***4.3.11.2 Size.** Each area of rescue assistance shall provide at least two accessible areas each being not less than 30 inches by 48 inches (760 mm by 1220 mm). The area of rescue assistance shall not encroach on any required exit width. The total number of such 30-inch by 48-inch (760 mm by 1220 mm) areas per story shall be not less than one for every 200 persons of calculated occupant load served by the area of rescue assistance.*

EXCEPTION: The appropriate local authority may reduce the minimum number of 30-inch by 48-inch (760 mm by 1220 mm) areas to one for each area of rescue assistance on floors where the occupant load is less than 200.

***4.3.11.3* Stairway Width.** Each stairway adjacent to an area of rescue assistance shall have a minimum clear width of 48 inches between handrails.*

***4.3.11.4* Two-way Communication.** A method of two-way communication, with both visible and audible signals, shall be provided between each area of rescue assistance and the primary entry. The fire department or appropriate local authority may approve a location other than the primary entry.*

***4.3.11.5 Identification.** Each area of rescue assistance shall be identified by a sign which states "AREA OF RESCUE ASSISTANCE" and displays the international symbol of accessibility. The sign shall be illuminated when exit sign illumination is required. Signage shall also be installed at all inaccessible exits and where otherwise necessary to clearly indicate the direction to areas of rescue assistance. In each area of rescue assistance, instructions on the use of the area under emergency conditions shall be posted adjoining the two-way communication system.*

4.4 Protruding Objects.

4.4.1* General. Objects projecting from walls (for example, telephones) with their leading edges between 27 in and 80 in (685 mm and 2030 mm) above the finished floor shall protrude no more than 4 in (100 mm) into walks, halls, corridors, passageways, or aisles (see Fig. 8(a)). Objects mounted with their leading edges at or below 27 in (685 mm) above the finished floor may protrude any amount (see Fig. 8(a) and (b)). Free-standing objects mounted on posts or pylons may overhang 12 in (305 mm) maximum from 27 in to 80 in (685 mm to 2030 mm) above the ground or

4.4 Protruding Objects

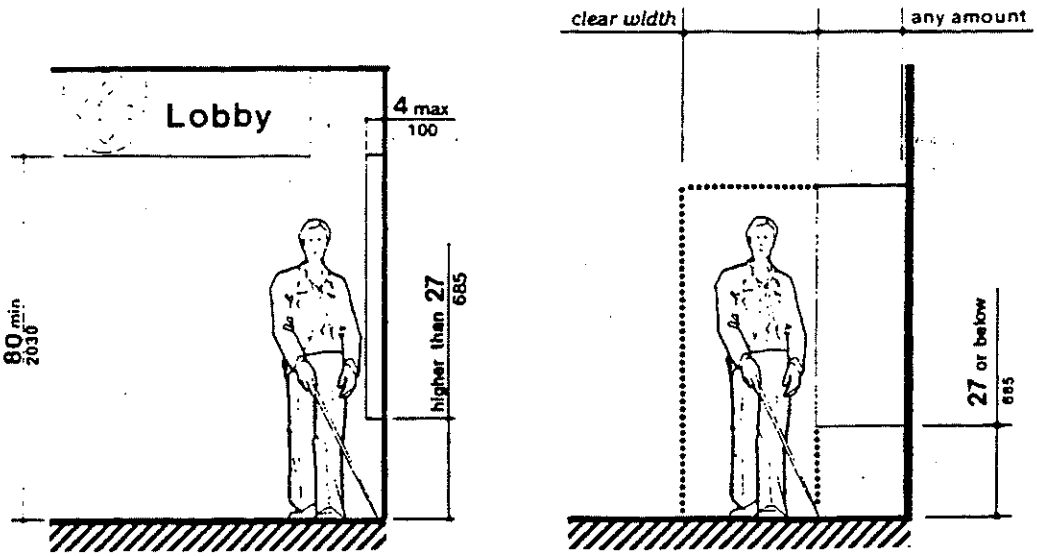


Fig. 8 (a)
Walking Parallel to a Wall

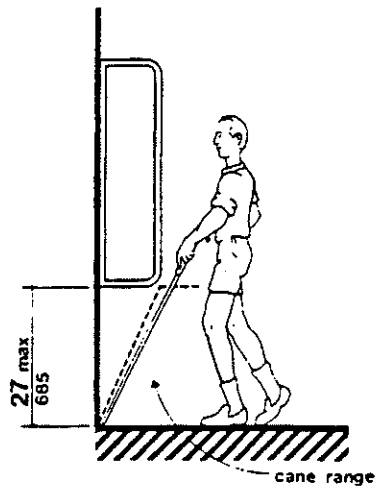


Fig. 8 (b)
Walking Perpendicular to a Wall

Fig. 8
Protruding Objects

finished floor (see Fig. 8(c) and (d)). Protruding objects shall not reduce the clear width of an accessible route or maneuvering space (see Fig. 8(e)).

4.4.2 Head Room. Walks, halls, corridors, passageways, aisles, or other circulation spaces shall have 80 in (2030 mm) minimum clear head room (see Fig. 8(a)). *If vertical clearance of an area adjoining an accessible route is reduced to less than 80 in (nominal dimension), a barrier to warn blind or visually-impaired persons shall be provided (see Fig. 8(c-1)).*

4.5 Ground and Floor Surfaces.

4.5.1* General. Ground and floor surfaces along accessible routes and in accessible rooms and spaces including floors, walks, ramps, stairs, and curb ramps, shall be stable, firm, slip-resistant, and shall comply with 4.5.

4.5.2 Changes in Level. Changes in level up to 1/4 in (6 mm) may be vertical and without edge treatment *(see Fig. 7(c))*. Changes in level between 1/4 in and 1/2 in (6 mm and 13 mm)

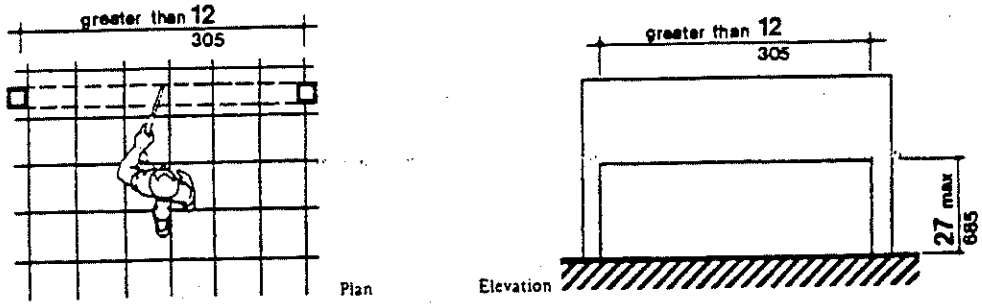


Fig. 8 (c) Free-Standing Overhanging Objects

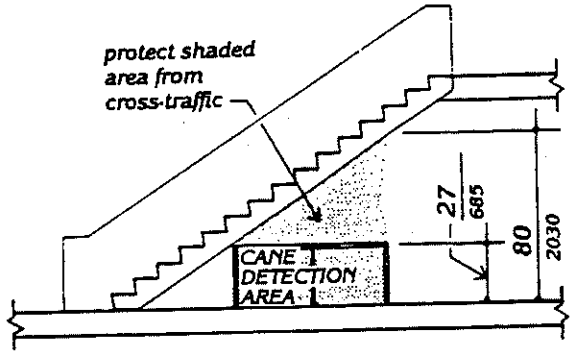


Fig. 8 (c-1) Overhead Hazards

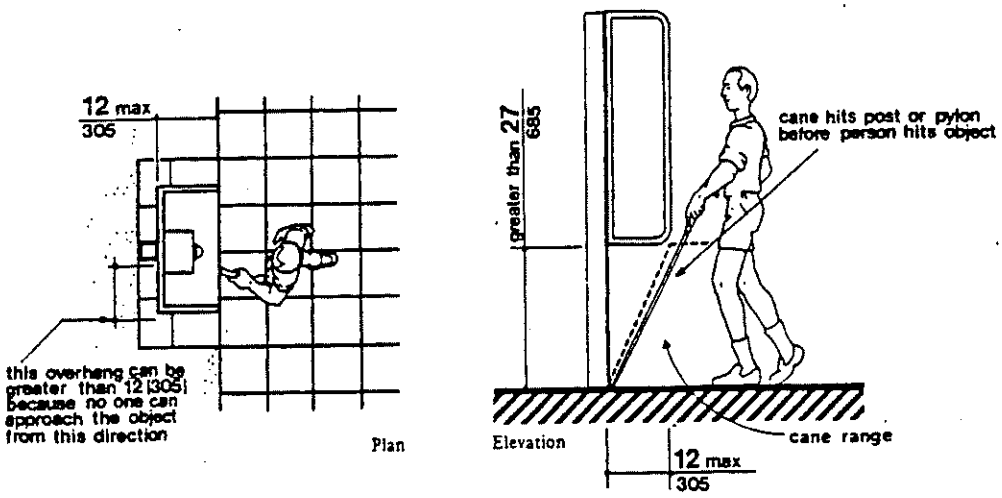


Fig. 8 (d)
Objects Mounted on Posts or Pylons

Fig. 8
Protruding Objects *(Continued)*

4.5 Ground and Floor Surfaces

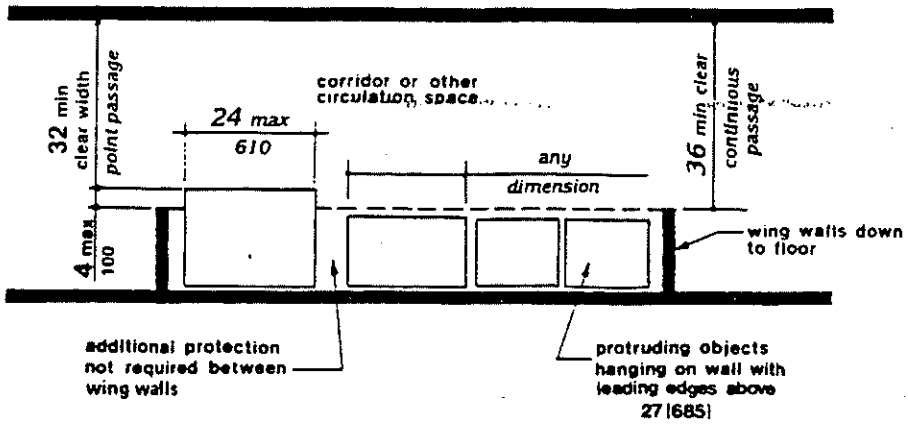


Fig. 8 (e)
Example of Protection around Wall-Mounted Objects and Measurements of Clear Widths

Fig. 8
Protruding Objects *(Continued)*

shall be beveled with a slope no greater than 1:2 *(see Fig. 7(d))*. Changes in level greater than 1/2 in (13 mm) shall be accomplished by means of a ramp that complies with 4.7 or 4.8.

4.5.3* Carpet. If carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing, or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile *thickness* shall be 1/2 in (13 mm) (see Fig. 8(f)). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim shall comply with 4.5.2.

4.5.4 Gratings. If gratings are located in walking surfaces, then they shall have spaces no greater than 1/2 in (13 mm) wide in one direction *(see Fig. 8(g))*. If gratings have elongated openings, then they shall be placed so that the long dimension is perpendicular to the dominant direction of travel *(see Fig. 8(h))*.

4.6 Parking and Passenger Loading Zones.

4.6.1 Minimum Number. *Parking spaces required to be accessible by 4.1 shall comply with 4.6.2 through 4.6.5. Passenger loading zones required to be accessible by 4.1 shall comply with 4.6.5 and 4.6.6.*

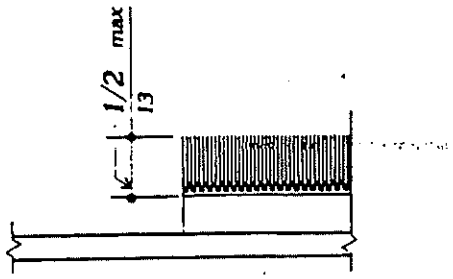


Fig. 8 (f)
Carpet Pile Thickness

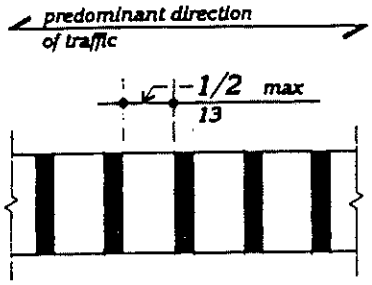


Fig. 8 (g)
Gratings

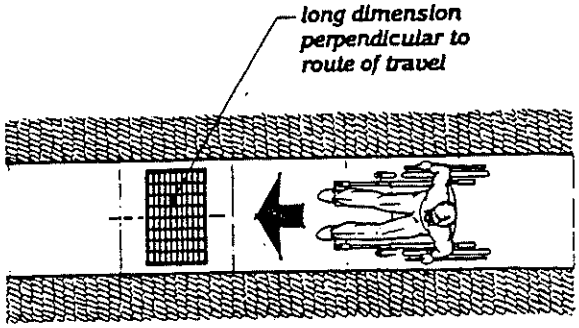


Fig. 8 (h)
Grating Orientation

4.6.2 Location. *Accessible parking spaces serving* a particular building shall be located on the shortest accessible route of travel *from adjacent parking* to an accessible entrance. *In parking facilities* that do not serve a particular building, *accessible parking* shall be located on the shortest accessible route *of travel* to an accessible pedestrian entrance of the parking facility. *In buildings with multiple accessible entrances with adjacent parking, accessible parking spaces shall be dispersed and located closest to the accessible entrances.*

4.6.3* Parking Spaces. *Accessible* parking spaces shall be at least 96 in (2440 mm) wide. Parking access aisles shall be part of an accessible route to the building or facility entrance and shall comply with 4.3. Two accessible parking spaces may share a common access aisle (see Fig. 9). Parked vehicle overhangs shall not reduce the clear width of an accessible route. *Parking spaces and access aisles shall be level with surface slopes not exceeding 1:50 (2%) in all directions.*

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4.6.4* Signage. Accessible parking spaces shall be designated as reserved by a sign showing the symbol of accessibility (see 4.30.7). *Spaces complying with 4.1.2(5)(b) shall have an additional sign "Van-Accessible" mounted below the symbol of accessibility.* Such signs shall *be located so they cannot* be obscured by a vehicle parked in the space.

4.6.5* *Vertical Clearance.* *Provide minimum vertical clearance of 114 in (2895 mm) at accessible passenger loading zones and along at least one vehicle access route to such areas from site entrance(s) and exit(s). At parking spaces complying with 4.1.2(5)(b), provide minimum vertical clearance of 98 in (2490 mm) at the parking space and along at least one vehicle access route to such spaces from site entrance(s) and exit(s).*

4.6.6 Passenger Loading Zones. Passenger loading zones shall provide an access aisle at least *60* in *(1525 mm)* wide and 20 ft *(240 in) (6100 mm)* long adjacent and parallel to the vehicle pull-up space (see Fig. 10). If there are curbs between the access aisle and the vehicle pull-up space, then a curb ramp complying with 4.7 shall be provided. *Vehicle standing spaces and access aisles shall be level with*

4.7 Curb Ramps

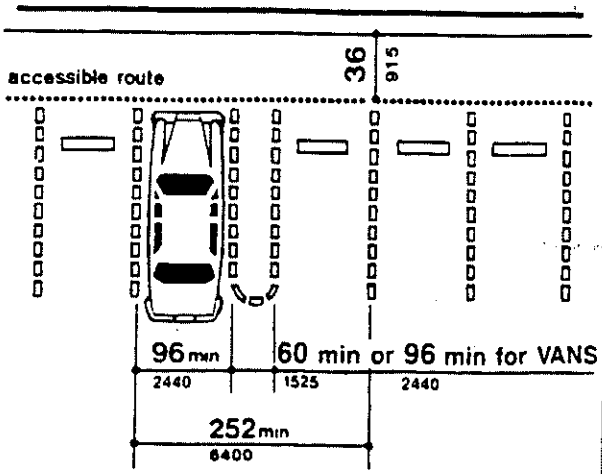


Fig. 9
Dimensions of Parking Spaces

surface slopes not exceeding 1:50 (2%) in all directions.

4.7 Curb Ramps.

4.7.1 Location. Curb ramps complying with 4.7 shall be provided wherever an accessible route crosses a curb.

4.7.2 Slope. Slopes of curb ramps shall comply with 4.8.2. The slope shall be measured as shown in Fig. 11. *Transitions from ramps to walks, gutters, or streets shall be flush and free of abrupt changes. Maximum slopes of adjoining gutters, road surface immediately adjacent to the curb ramp, or accessible route shall not exceed 1:20.*

4.7.3 Width. The minimum width of a curb ramp shall be 36 in (915 mm), exclusive of flared sides.

4.7.4 Surface. Surfaces of curb ramps shall comply with 4.5.

4.7.5 Sides of Curb Ramps. If a curb ramp is located where pedestrians must walk across the ramp, *or where it is not protected by handrails or guardrails,* it shall have flared sides; the maximum slope of the flare shall be 1:10 (see Fig. 12(a)). Curb ramps with returned curbs may be used where pedestrians would not normally walk across the ramp (see Fig. 12(b)).

4.7.6 Built-up Curb Ramps. Built-up curb ramps shall be located so that they do not project into vehicular traffic lanes (see Fig. 13).

4.7.7 *Detectable Warnings.* A curb ramp shall have a *detectable* warning complying with 4.29.2. *The detectable warning shall extend* the full width and depth of the curb ramp.

4.7.8 Obstructions. Curb ramps shall be located or protected to prevent their obstruction by parked vehicles.

4.7.9 Location at Marked Crossings. Curb ramps at marked crossings shall be wholly contained within the markings, excluding any flared sides (see Fig. 15).

4.7.10 Diagonal Curb Ramps. If diagonal (or corner type) curb ramps have returned curbs or other well-defined edges, such edges shall be parallel to the direction of pedestrian flow. The bottom of diagonal curb ramps shall have 48 in (1220 mm) minimum clear space as shown in Fig. 15(c) and (d). If diagonal curb ramps are provided at marked crossings, the 48 in (1220 mm) clear space shall be within the markings (see Fig. 15(c) and (d)). If diagonal curb ramps have flared sides, they shall also have at least a 24 in (610 mm) long segment of straight curb located on each side of the curb ramp and within the marked crossing (see Fig. 15(c)).

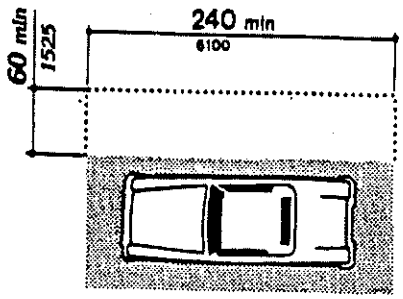


Fig. 10
Access Aisle at Passenger Loading Zones

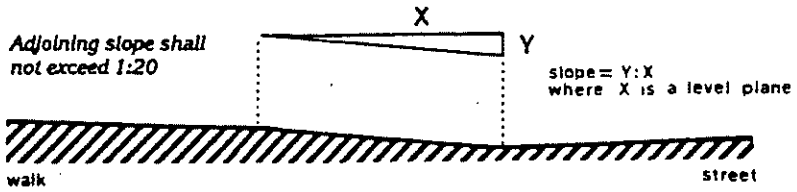
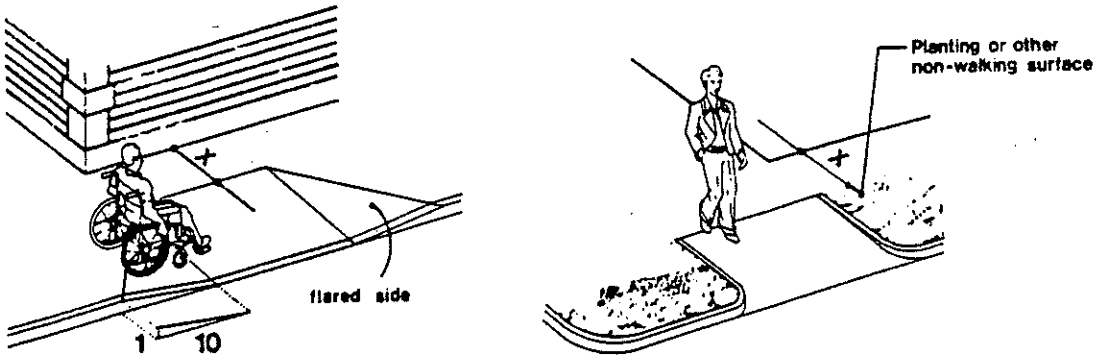


Fig. 11
Measurement of Curb Ramp Slopes



(a)
Flared Sides

(b)
Returned Curb

If X is less than 48 in, then the slope of the flared side shall not exceed 1:12.

Fig. 12
Sides of Curb Ramps

4.7.11 Islands. Any raised islands in crossings shall be cut through level with the street or have curb ramps at both sides and a level area at least 48 in (1220 mm) long between the curb ramps in the part of the island intersected by the crossings (see Fig. 15(a) and (b)).

4.8 Ramps.

4.8.1* General. Any part of an accessible route with a slope greater than 1:20 shall be considered a ramp and shall comply with 4.8.

4.8.2* Slope and Rise. The least possible slope shall be used for any ramp. The maximum slope of a ramp in new construction shall be 1:12. The maximum rise for any run shall be 30 in (760 mm) (see Fig. 16). Curb ramps

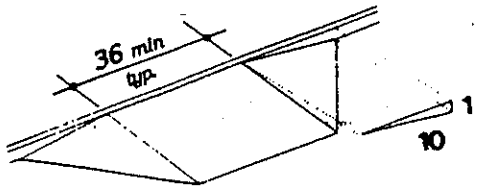


Fig. 13
Built-Up Curb Ramp

and ramps to be constructed on existing sites or in existing buildings or facilities may have slopes and rises as *allowed in 4.1.6(3)(a)* if space limitations prohibit the use of a 1:12 slope or less.

4.8 Ramps

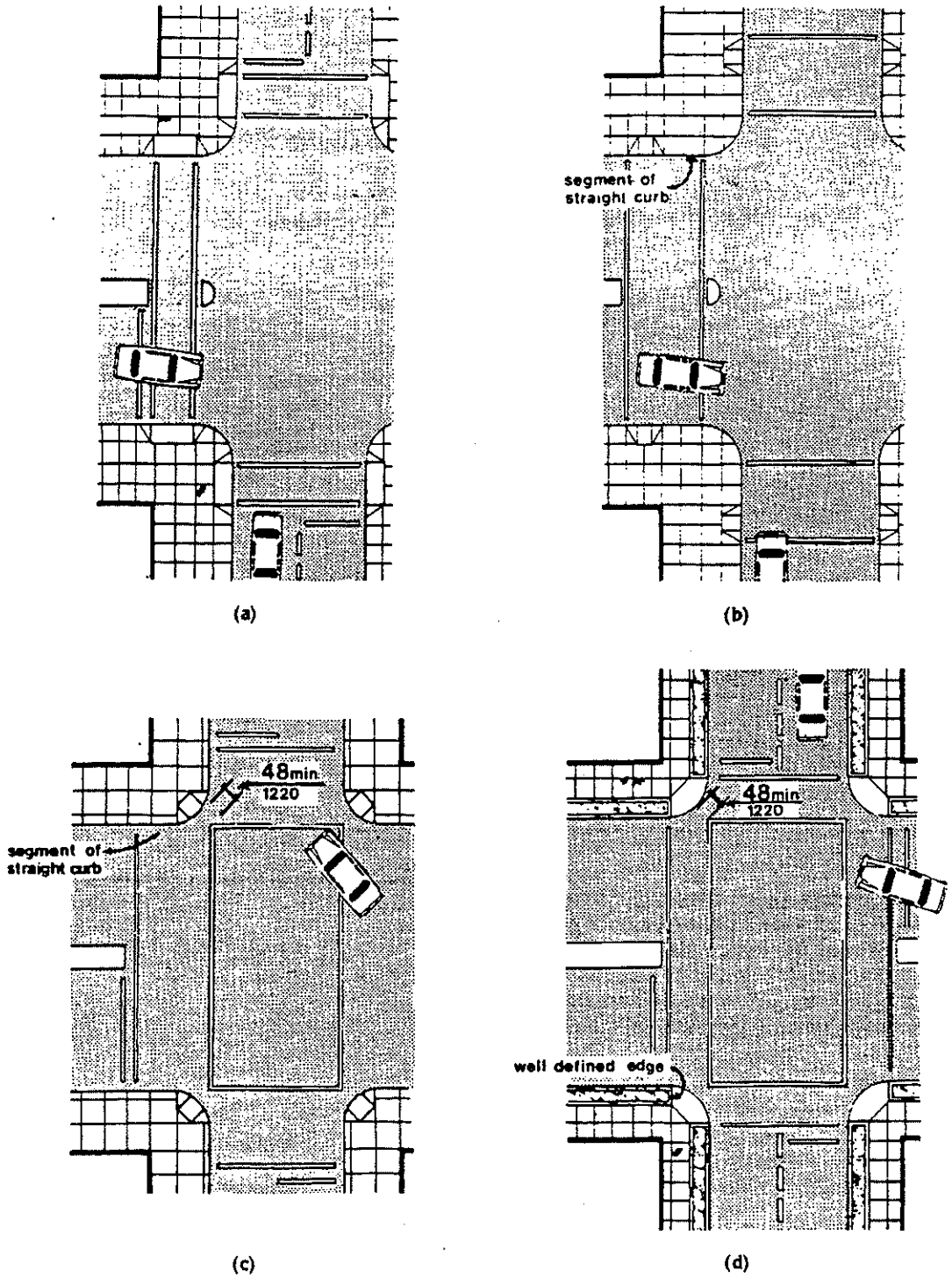
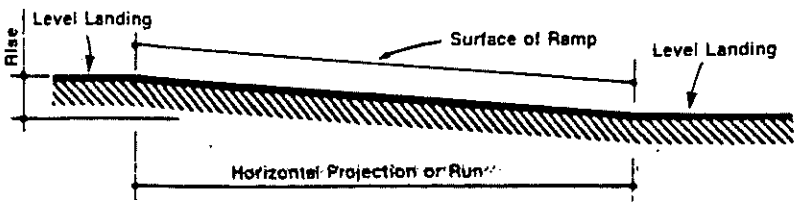


Fig. 15
Curb Ramps at Marked Crossings



	Maximum Rise		Maximum Horizontal Projection	
Slope	in	mm	ft	m
1:12 to < 1:16	30	760	30	9
1:16 to < 1:20	30	760	40	12

Fig. 16
Components of a Single Ramp Run and Sample Ramp Dimensions

4.8.3 Clear Width. The minimum clear width of a ramp shall be 36 in (915 mm).

4.8.4* Landings. Ramps shall have level landings at bottom and top of *each ramp and* each *ramp* run. Landings shall have the following features:

(1) The landing shall be at least as wide as the ramp run leading to it.

(2) The landing length shall be a minimum of 60 in (1525 mm) clear.

(3) If ramps change direction at landings, the minimum landing size shall be 60 in by 60 in (1525 mm by 1525 mm).

(4) If a doorway is located at a landing, then the area in front of the doorway shall comply with 4.13.6.

4.8.5* Handrails. If a ramp run has a rise greater than 6 in (150 mm) or a horizontal projection greater than 72 in (1830 mm), then it shall have handrails on both sides. Handrails are not required on curb ramps *or adjacent to seating in assembly areas.* Handrails shall comply with 4.26 and shall have the following features:

(1) Handrails shall be provided along both sides of ramp segments. The inside handrail on switchback or dogleg ramps shall always be continuous.

(2) If handrails are not continuous, they shall extend at least 12 in (305 mm) beyond the top and bottom of the ramp segment and shall be parallel with the floor or ground surface (see Fig. 17).

(3) The clear space between the handrail and the wall shall be 1 - 1/2 in (38 mm).

(4) Gripping surfaces shall be continuous.

(5) Top of handrail gripping surfaces shall be mounted between 34 in and 38 in (865 mm and 965 mm) above ramp surfaces.

(6) Ends of handrails shall be either rounded or returned smoothly to floor, wall, or post.

(7) Handrails shall not rotate within their fittings.

4.8.6 Cross Slope and Surfaces. The cross slope of ramp surfaces shall be no greater than 1:50. Ramp surfaces shall comply with 4.5.

4.8.7 Edge Protection. Ramps and landings with drop-offs shall have curbs, walls, railings, or projecting surfaces that prevent people from slipping off the ramp. Curbs shall be a minimum of 2 in (50 mm) high (see Fig. 17).

4.8.8 Outdoor Conditions. Outdoor ramps and their approaches shall be designed so that water will not accumulate on walking surfaces.

4.9 Stairs.

4.9.1* Minimum Number. *Stairs required to be accessible by 4.1 shall comply with 4.9.*

4.9.2 Treads and Risers. On any given flight of stairs, all steps shall have uniform riser heights and uniform tread widths. Stair treads shall be no less than 11 in (280 mm) wide, measured from riser to riser (see Fig. 18(a)). *Open risers are not permitted.*

4.9.3 Nosings. The undersides of nosings shall not be abrupt. The radius of curvature at the leading edge of the tread shall be no greater than 1/2 in (13 mm). Risers shall be sloped or the underside of the nosing shall have an angle not less than 60 degrees from the horizontal. Nosings shall project no more than 1-1/2 in (38 mm) (see Fig. 18).

4.9.4 Handrails. Stairways shall have handrails at both sides of all stairs. Handrails shall comply with 4.26 and shall have the following features:

(1) Handrails shall be continuous along both sides of stairs. The inside handrail on switchback or dogleg stairs shall always be continuous (see Fig. 19(a) and (b)).

(2) If handrails are not continuous, they shall extend at least 12 in (305 mm) beyond the top riser and at least 12 in (305 mm) plus the width of one tread beyond the bottom riser. At the top, the extension shall be parallel with the floor or ground surface. At the bottom, the handrail shall continue to slope for a distance of the width of one tread from the bottom riser; the remainder of the extension shall be horizontal (see Fig. 19(c) and (d)). Handrail extensions shall comply with 4.4.

(3) The clear space between handrails and wall shall be 1-1/2 in (38 mm).

(4) Gripping surfaces shall be uninterrupted by newel posts, other construction elements, or obstructions.

(5) Top of handrail gripping surface shall be mounted between 34 in and 38 in (865 mm and 965 mm) above stair nosings.

(6) Ends of handrails shall be either rounded or returned smoothly to floor, wall or post.

(7) Handrails shall not rotate within their fittings.

4.9.5 *Detectable* Warnings at Stairs. *(Reserved).*

4.9.6 Outdoor Conditions. Outdoor stairs and their approaches shall be designed so that water will not accumulate on walking surfaces.

4.10 Elevators.

4.10.1 General. *Accessible* elevators shall be on an accessible route and shall comply with 4.10 and with the *ASME A17.1-1990*, Safety Code for Elevators and Escalators. *Freight elevators shall not be considered as meeting the requirements of this section unless the only elevators provided are used as combination passenger and freight elevators for the public and employees.*

4.10.2 Automatic Operation. Elevator operation shall be automatic. Each car shall be equipped with a self-leveling feature that will automatically bring the car to floor landings within a tolerance of 1/2 in (13 mm) under rated loading to zero loading conditions. This self-leveling feature shall be automatic and independent of the operating device and shall correct the overtravel or undertravel.

4.10.3 Hall Call Buttons. Call buttons in elevator lobbies and halls shall be centered at 42 in (1065 mm) above the floor. Such call buttons shall have visual signals to indicate when each call is registered and when each call is answered. Call buttons shall be a minimum of 3/4 in (19 mm) in the smallest dimension. The button designating the up direction shall be on top. (See Fig. 20.) *Buttons shall be raised or flush. Objects mounted beneath hall call buttons shall not project into the elevator lobby more than 4 in (100 mm).*

4.10 Elevators

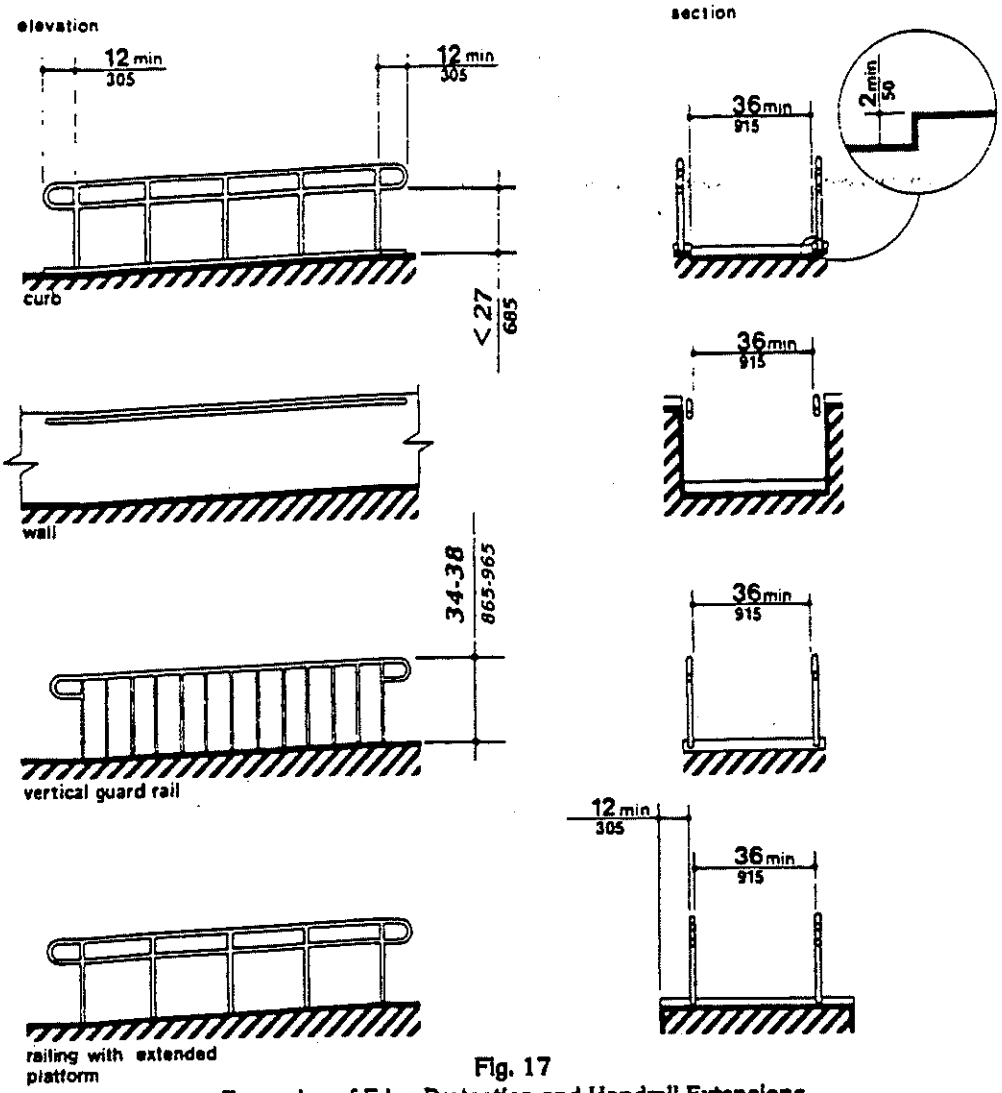


Fig. 17
Examples of Edge Protection and Handrail Extensions

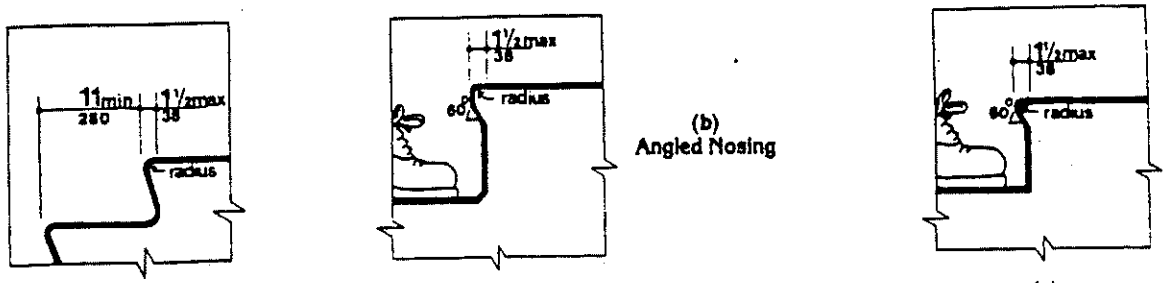
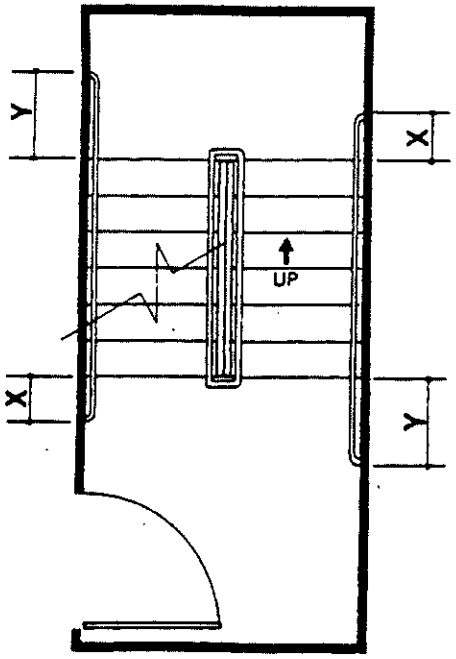
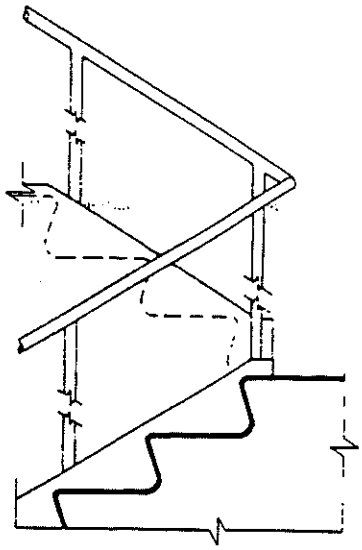


Fig. 18
Usable Tread Width and Examples of Acceptable Nosings

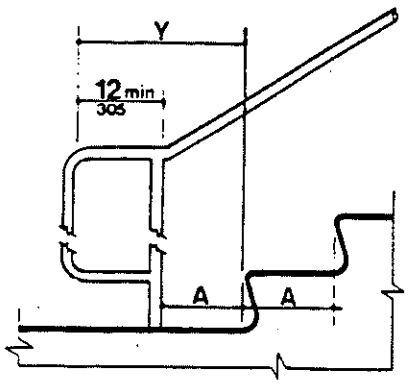
4.10 Elevators



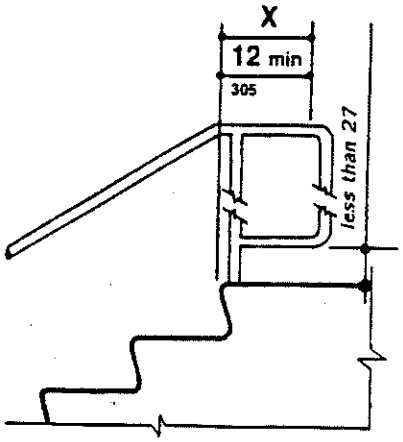
(a)
Plan



(b)
Elevation of Center Handrail



(c)
Extension at Bottom of Run



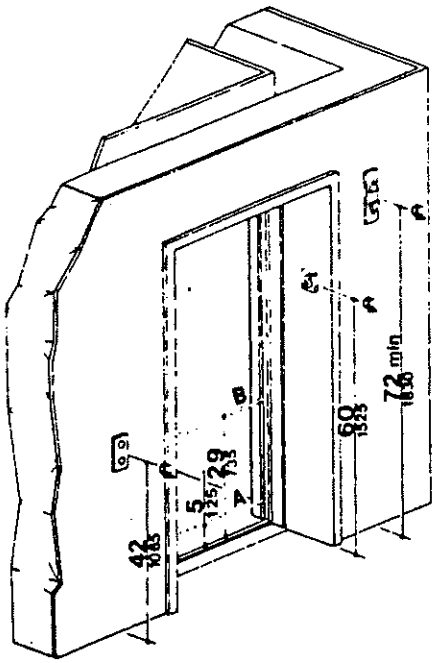
(d)
Extension at Top of Run

NOTE:

X is the 12 in minimum handrail extension required at each top riser.

Y is the minimum handrail extension of 12 in plus the width of one tread that is required at each bottom riser.

Fig. 19
Stair Handrails



NOTE: The automatic door reopening device is activated if an object passes through either line A or line B. Line A and line B represent the vertical locations of the door reopening device not requiring contact.

Fig. 20
Hoistway and Elevator Entrances

4.10.4 Hall Lanterns. A visible and audible signal shall be provided at each hoistway entrance to indicate which car is answering a call. Audible signals shall sound once for the up direction and twice for the down direction or shall have verbal annunciators that say "up" or "down." Visible signals shall have the following features:

(1) Hall lantern fixtures shall be mounted so that their centerline is at least 72 in (1830 mm) above the lobby floor. (See Fig. 20.)

(2) Visual elements shall be at least 2-1/2 in (64 mm) in the smallest dimension.

(3) Signals shall be visible from the vicinity of the hall call button (see Fig. 20). In-car lanterns located in cars, visible from the vicinity of hall call buttons, and conforming to the above requirements, shall be acceptable.

4.10.5 *Raised and Braille* Characters on Hoistway Entrances. All elevator hoistway entrances shall have *raised and Braille* floor designations provided on both jambs. The centerline of the characters shall be 60 in (1525 mm) *above finish* floor. Such characters shall be 2 in (50 mm) high and shall comply with 4.30.4. Permanently applied plates are acceptable if they are permanently fixed to the jambs. (See Fig. 20).

4.10.6* Door Protective and Reopening Device. Elevator doors shall open and close automatically. They shall be provided with a reopening device that will stop and reopen a car door and hoistway door automatically if the door becomes obstructed by an object or person. The device shall be capable of completing these operations without requiring contact for an obstruction passing through the opening at heights of 5 in and 29 in (125 mm and 735 mm) above finish floor (see Fig. 20). Door reopening devices shall remain effective for at least 20 seconds. After such an interval, doors may close in accordance with the requirements of *ASME A17.1-1990.*

4.10.7* Door and Signal Timing for Hall Calls. The minimum acceptable time from notification that a car is answering a call until the doors of that car start to close shall be calculated from the following equation:

$$T = D/(1.5 \text{ ft/s}) \text{ or } T = D/(445 \text{ mm/s})$$

where T total time in seconds and D distance (in feet or millimeters) from a point in the lobby or corridor 60 in (1525 mm) directly in front of the farthest call button controlling that car to the centerline of its hoistway door (see Fig. 21). For cars with in-car lanterns, T begins when the lantern is visible from the vicinity of hall call buttons and an audible signal is sounded. *The minimum acceptable notification time shall be 5 seconds.*

4.10.8 Door Delay for Car Calls. The minimum time for elevator doors to remain fully open in response to a car call shall be 3 seconds.

4.10.9 Floor Plan of Elevator Cars. The floor area of elevator cars shall provide space for wheelchair users to enter the car, maneuver

4.10.12 Car Controls

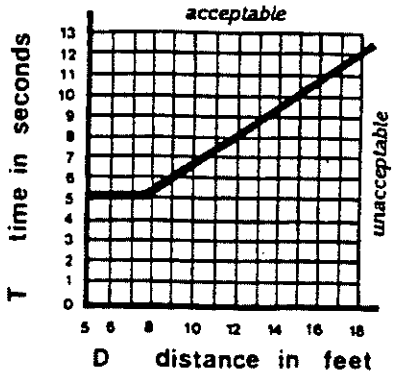


Fig. 21
Graph of Timing Equation

within reach of controls, and exit from the car. Acceptable door opening and inside dimensions shall be as shown in Fig. 22. The clearance between the car platform sill and the edge of any hoistway landing shall be no greater than 1-1/4 in (32 mm).

4.10.10 Floor Surfaces. Floor surfaces shall comply with 4.5.

4.10.11 Illumination Levels. The level of illumination at the car controls, platform, and car threshold and landing sill shall be at least 5 footcandles (53.8 lux).

4.10.12* Car Controls. Elevator control panels shall have the following features:

(1) Buttons. All control buttons shall be at least 3/4 in (19 mm) in their smallest dimension. They *shall* be *raised* or flush.

(2) Tactile, *Braille*, and Visual Control Indicators. All control buttons shall be designated by *Braille and by raised* standard alphabet characters for letters, arabic characters for numerals, or standard symbols as shown in Fig. 23(a), and as required in *ASME A17.1-1990, Raised and Braille* characters and symbols shall comply with 4.30. The call button for the main entry floor shall be designated by a *raised* star at the left of the floor designation (see Fig. 23(a)). All raised designations for control buttons shall be placed immediately to the left of the button to which they apply. Applied plates,

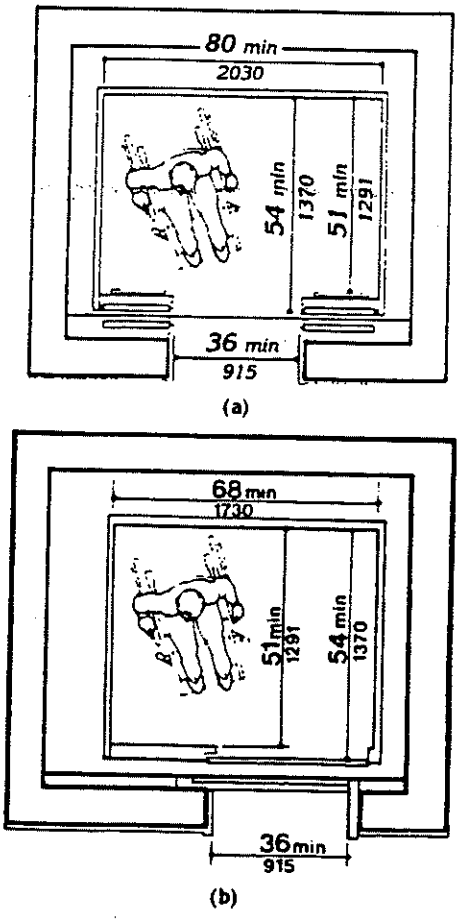
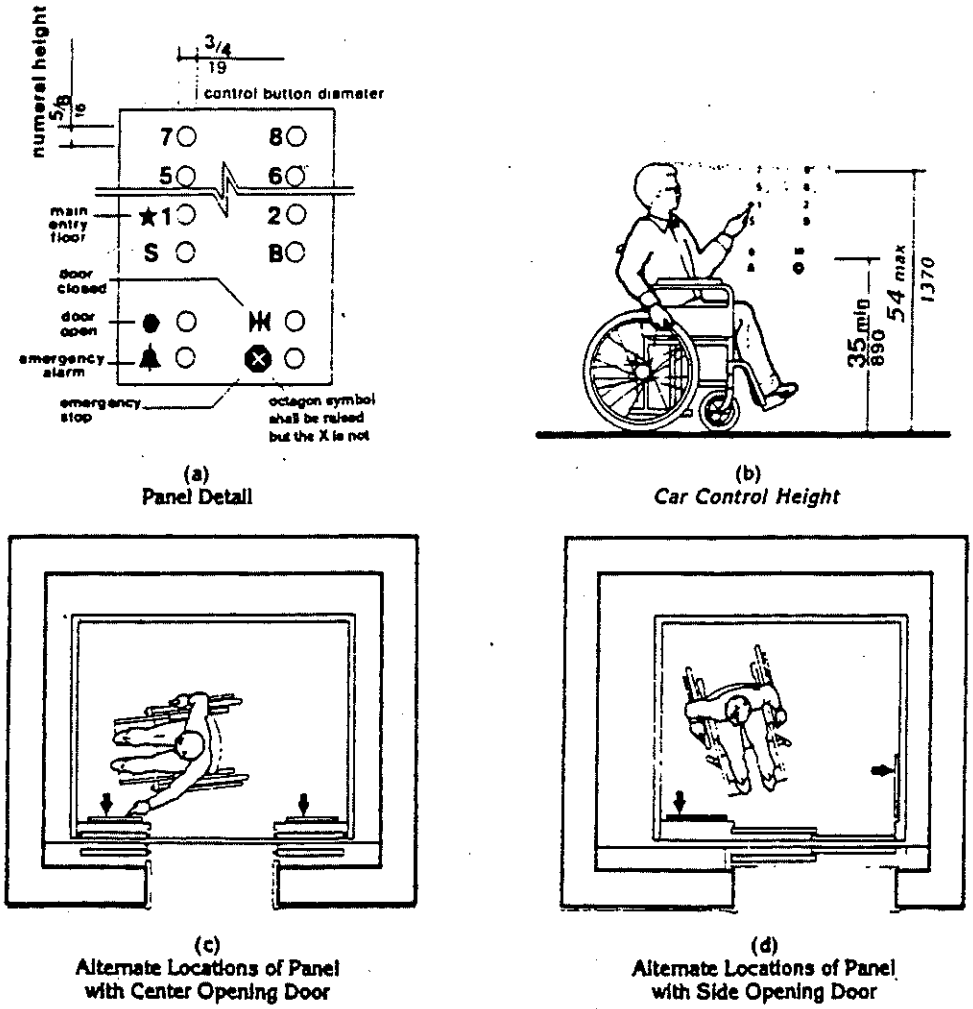


Fig. 22
Minimum Dimensions of Elevator Cars

permanently attached, are an acceptable means to provide raised control designations. Floor buttons shall be provided with visual indicators to show when each call is registered. The visual indicators shall be extinguished when each call is answered.

(3) Height. All floor buttons shall be no higher than 54 in (1370 mm) above the *finish floor for side approach and 48 in (1220 mm) for front approach.* Emergency controls, including the emergency alarm and emergency stop, shall be grouped at the bottom of the panel and shall have their centerlines no less than 35 in (890 mm) above the finish floor (see Fig. 23(a) and (b)).

4.10.13* Car Position Indicators



(a)
Panel Detail

(b)
Car Control Height

(c)
Alternate Locations of Panel with Center Opening Door

(d)
Alternate Locations of Panel with Side Opening Door

Fig. 23
Car Controls

(4) Location. Controls shall be located on a front wall if cars have center opening doors, and at the side wall or at the front wall next to the door if cars have side opening doors (see Fig. 23(c) and (d)).

4.10.13* Car Position Indicators. In elevator cars, a visual car position indicator shall be provided above the car control panel or over the door to show the position of the elevator in the hoistway. As the car passes or stops at a floor served by the elevators, the corresponding numerals shall illuminate, and an audible signal shall sound. Numerals shall be a minimum of 1/2 in (13 mm) high. The audible signal shall be no less than 20 decibels with a frequency no higher than 1500 Hz. An automatic verbal announcement of the floor number at which a car stops or which a car passes may be substituted for the audible signal.

4.10.14* Emergency Communications. If provided, emergency two-way communication systems between the elevator and a point outside the hoistway shall comply with *ASME*

A17.1-1990. The highest operable part of a two-way communication system shall be a maximum of *48 in (1220 mm)* from the floor of the car. It shall be identified by a raised symbol and lettering complying with 4.30 and located adjacent to the device. If the system uses a handset then the length of the cord from the panel to the handset shall be at least 29 in (735 mm). *If the system is located in a closed compartment the compartment door hardware shall conform to 4.27, Controls and Operating Mechanisms. The emergency intercommunication system shall not require voice communication.*

4.11 Platform Lifts *(Wheelchair Lifts).*

4.11.1 Location. *Platform lifts (wheelchair lifts) permitted by 4.1 shall comply with the requirements of 4.11.*

69.28 **4.11.2* Other Requirements.** If platform lifts *(wheelchair lifts)* are used, they shall comply with 4.2.4, 4.5, 4.27, and *ASME A17.1 Safety Code for Elevators and Escalators, Section XX, 1990.*

4.11.3 Entrance. *If platform lifts are used then they shall facilitate unassisted entry, operation, and exit from the lift in compliance with 4.11.2.*

4.12 Windows.

4.12.1* General. *(Reserved).*

4.12.2* Window Hardware. *(Reserved).*

4.13 Doors.

4.13.1 General. *Doors required to be accessible by 4.1* shall comply with the requirements of 4.13.

4.13.2 Revolving Doors and Turnstiles. Revolving doors or turnstiles shall not be the only means of passage at an accessible entrance or along an accessible route. *An accessible gate or door shall be provided adjacent to the turnstile or revolving door and shall be so designed as to facilitate the same use pattern.*

4.13.3 Gates. Gates, including ticket gates, shall meet all applicable specifications of 4.13.

4.13.4 Double-Leaf Doorways. If doorways have two *independently operated* door leaves, then at least one leaf shall meet the specifications in 4.13.5 and 4.13.6. That leaf shall be an active leaf.

4.13.5 Clear Width. Doorways shall have a minimum clear opening of 32 in (815 mm) with the door open 90 degrees, measured between the face of the door and the *opposite* stop (see Fig. 24(a), (b), (c), and (d)). Openings more than 24 in (610 mm) in depth shall comply with 4.2.1 and 4.3.3 (see Fig. 24(e)).

EXCEPTION: Doors not requiring full user passage, such as shallow closets, may have the clear opening reduced to 20 in (510 mm) minimum.

4.13.6 Maneuvering Clearances at Doors. Minimum maneuvering clearances at doors that are not automatic or power-assisted shall be as shown in Fig. 25. The floor or ground area within the required clearances shall be level and clear. 69.29

EXCEPTION: Entry doors to acute care hospital bedrooms for in-patients shall be exempted from the requirement for space at the latch side of the door (see dimension "x" in Fig. 25) if the door is at least 44 in (1120 mm) wide.

4.13.7 Two Doors in Series. The minimum space between two hinged or pivoted doors in series shall be 48 in (1220 mm) plus the width of any door swinging into the space. Doors in series shall swing either in the same direction or away from the space between the doors (see Fig. 26). 69.29 (2)

4.13.8* Thresholds at Doorways. Thresholds at doorways shall not exceed 3/4 in (19 mm) in height for exterior sliding doors or 1/2 in (13 mm) for other types of doors. Raised thresholds and floor level changes at accessible doorways shall be beveled with a slope no greater than 1:2 (see 4.5.2).

4.13.9* Door Hardware. Handles, pulls, latches, locks, and other operating devices on accessible doors shall have a shape that is easy

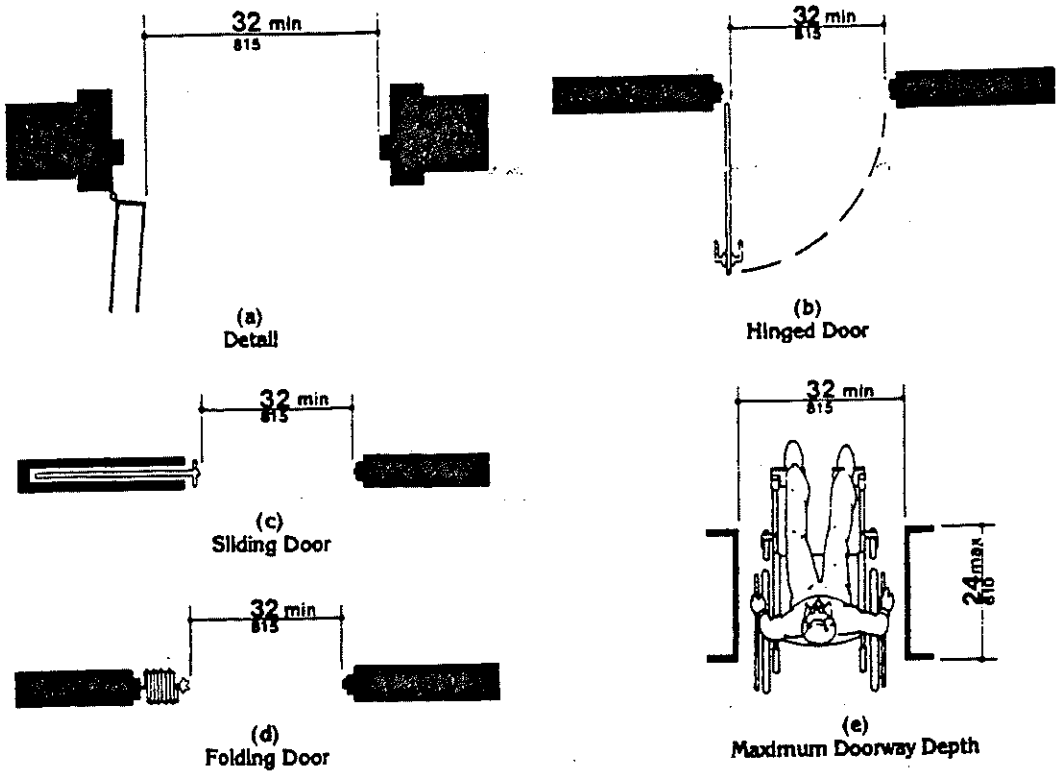


Fig. 24
Clear Doorway Width and Depth

to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. Lever-operated mechanisms, push-type mechanisms, and U-shaped handles are acceptable designs. When sliding doors are fully open, operating hardware shall be exposed and usable from both sides. *Hardware required for accessible door passage shall be mounted no higher than 48 in (1220 mm) above finished floor.*

4.13.10* Door Closers. If a door has a closer, then the sweep period of the closer shall be adjusted so that from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 in (75 mm) from the latch, measured to the leading edge of the door.

4.13.11* Door Opening Force. The maximum force for pushing or pulling open a door shall be as follows:

(1) Fire doors shall have the minimum opening force allowable by the appropriate administrative authority.

(2) Other doors.

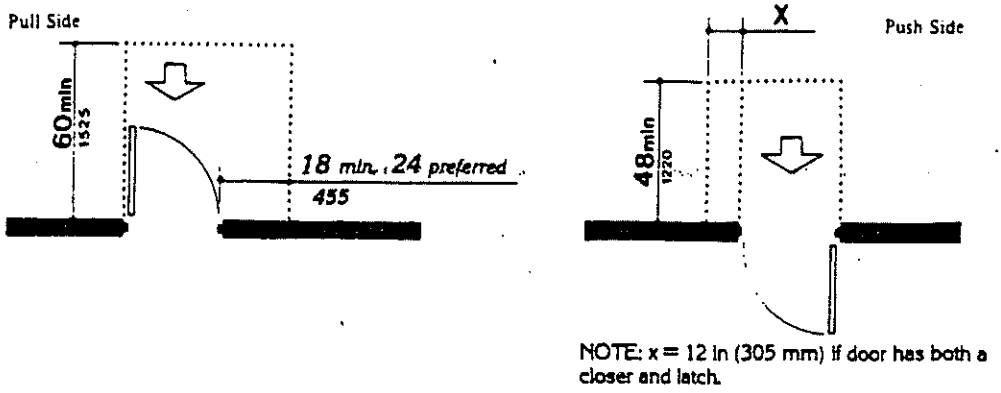
(a) exterior hinged doors: *(Reserved).*

(b) interior hinged doors: 5 lbf (22.2N)

(c) sliding or folding doors: 5 lbf (22.2N)

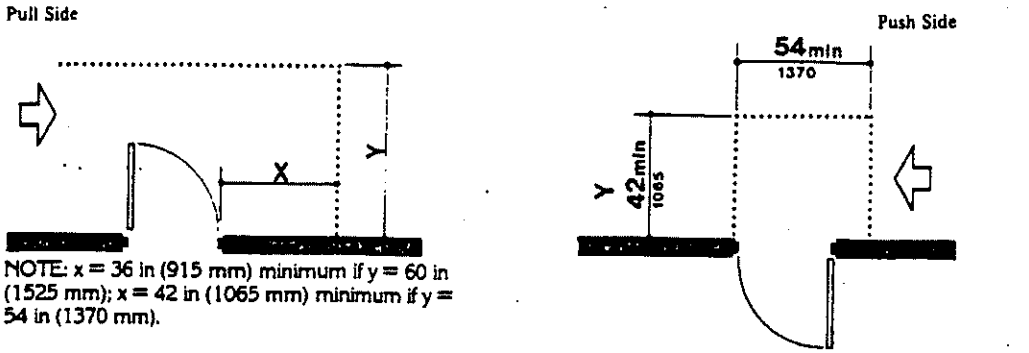
These forces do not apply to the force required to retract latch bolts or disengage other devices that may hold the door in a closed position.

4.13 Doors



NOTE: x = 12 in (305 mm) if door has both a closer and latch.

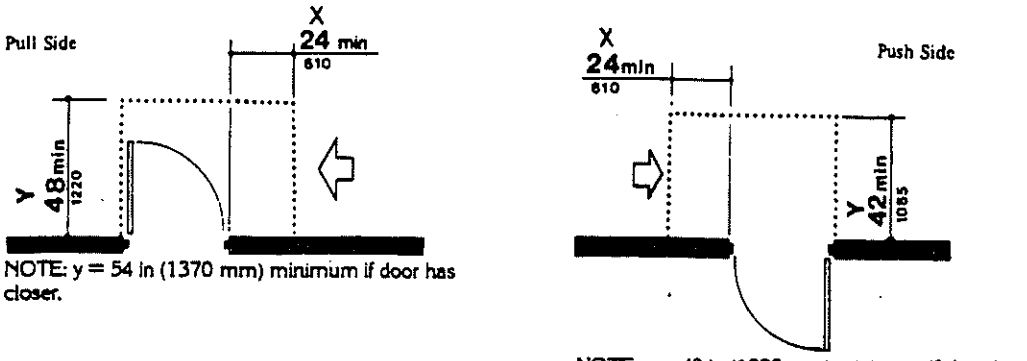
(a)
Front Approaches — Swinging Doors



NOTE: x = 36 in (915 mm) minimum if y = 60 in (1525 mm); x = 42 in (1065 mm) minimum if y = 54 in (1370 mm).

NOTE: y = 48 in (1220 mm) minimum if door has both a latch and closer.

(b)
Hinge Side Approaches — Swinging Doors



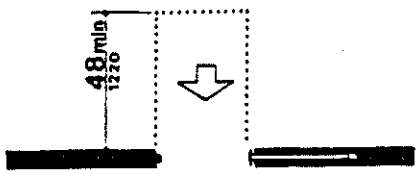
NOTE: y = 54 in (1370 mm) minimum if door has closer.

NOTE: y = 48 in (1220 mm) minimum if door has closer.

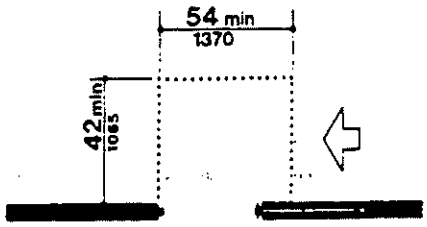
(c)
Latch Side Approaches — Swinging Doors

NOTE: All doors in alcoves shall comply with the clearances for front approaches.

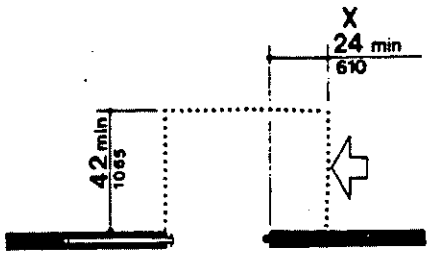
Fig. 25
Maneuvering Clearances at Doors



(d)
Front Approach — Sliding Doors
and Folding Doors



(e)
Slide Side Approach — Sliding Doors
and Folding Doors



(f)
Latch Side Approach — Sliding Doors *and Folding Doors*

NOTE: All doors in alcoves shall comply with the clearances for front approaches.

Fig. 25
Maneuvering Clearances at Doors *(Continued)*

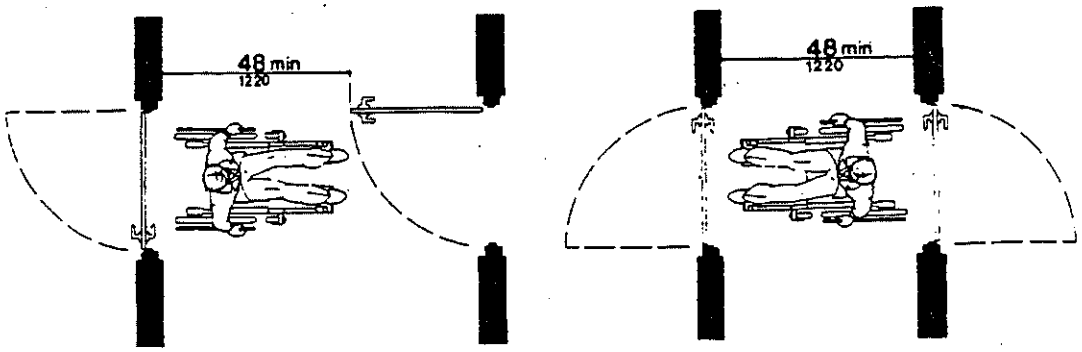


Fig. 26
Two Hinged Doors in Series

4.14 Entrances

4.13.12* Automatic Doors and Power-Assisted Doors. If an automatic door is used, then it shall comply with *ANSI/BHMA A156.10-1985.* Slowly opening, low-powered, automatic doors shall *comply with ANSI A156.19-1984.* Such doors shall not open to back check faster than 3 seconds and shall require no more than 15 lbf (66.6N) to stop door movement. If a power-assisted door is used, its door-opening force shall comply with 4.13.11 and its closing shall conform to the requirements in *ANSI A156.19-1984.*

4.14 Entrances.

4.14.1 Minimum Number. *Entrances required to be accessible by 4.1* shall be part of an accessible route complying with 4.3. Such entrances shall be connected by an accessible route to public transportation stops, to accessible parking and passenger loading zones, and to public streets or sidewalks if available (see 4.3.2(1)). They shall also be connected by an accessible route to all accessible spaces or elements within the building or facility.

4.14.2 Service Entrances. A service entrance shall not be the sole accessible entrance unless it is the only entrance to a building or facility (for example, in a factory or garage).

4.15 Drinking Fountains and Water Coolers.

4.15.1 Minimum Number. *Drinking fountains or water coolers required to be accessible by 4.1* shall comply with 4.15.

4.15.2* Spout Height. Spouts shall be no higher than 36 in (915 mm), measured from the floor or ground surfaces to the spout outlet (see Fig. 27(a)).

4.15.3 Spout Location. The spouts of drinking fountains and water coolers shall be at the front of the unit and shall direct the water flow in a trajectory that is parallel or nearly parallel to the front of the unit. The spout shall provide a flow of water at least 4 in (100 mm) high so as to allow the insertion of a cup or glass under the flow of water. *On an accessible drinking fountain with a round or oval bowl, the spout must be positioned so the flow of water is within 3 in (75 mm) of the front edge of the fountain.*

4.15.4 Controls. Controls shall comply with 4.27.4. *Unit controls shall be front mounted or side mounted near the front edge.*

4.15.5 Clearances.

(1) Wall- and post-mounted cantilevered units shall have a clear knee space between the bottom of the apron and the floor or ground at least 27 in (685 mm) high, 30 in (760 mm) wide, and 17 in to 19 in (430 mm to 485 mm) deep (see Fig. 27(a) and (b)). Such units shall also have a minimum clear floor space 30 in by 48 in (760 mm by 1220 mm) to allow a person in a wheelchair to approach the unit facing forward.

(2) Free-standing or built-in units not having a clear space under them shall have a clear floor space at least 30 in by 48 in (760 mm by 1220 mm) that allows a person in a wheelchair to make a parallel approach to the unit (see Fig. 27(c) and (d)). This clear floor space shall comply with 4.2.4.

4.16 Water Closets.

4.16.1 General. Accessible water closets shall comply with 4.16.

4.16.2 Clear Floor Space. Clear floor space for water closets not in stalls shall comply with Fig. 28. Clear floor space may be arranged to allow either a left-handed or right-handed approach.

4.16.3* Height. The height of water closets shall be 17 in to 19 in (430 mm to 485 mm), measured to the top of the toilet seat (see Fig. 29(b)). *Seats shall not be sprung to return to a lifted position.*

4.16.4* Grab Bars. Grab bars for water closets not located in stalls shall comply with 4.26 and Fig. 29. *The grab bar behind the water closet shall be 36 in (915 mm) minimum.*

4.16.5* Flush Controls. Flush controls shall be hand operated *or automatic* and shall comply with 4.27.4. Controls for flush valves

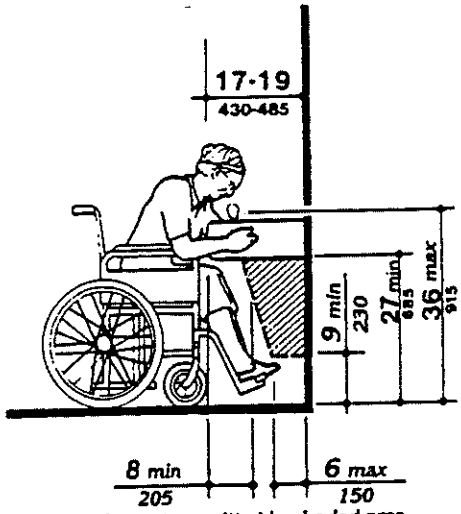
shall be mounted on the wide side of toilet areas no more than 44 in (1120 mm) above the floor.

4.16.6 Dispensers. Toilet paper dispensers shall be installed within reach, as shown in Fig. 29(b). *Dispensers that control delivery, or that do not permit continuous paper flow, shall not be used.*

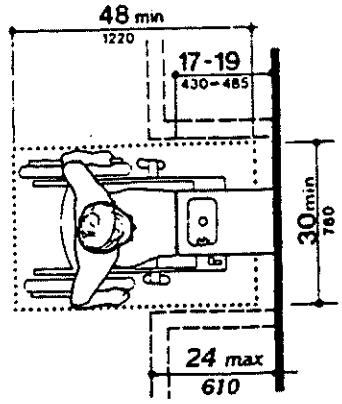
4.17 Toilet Stalls.

4.17.1 Location. Accessible toilet stalls shall be on an accessible route and shall meet the requirements of 4.17.

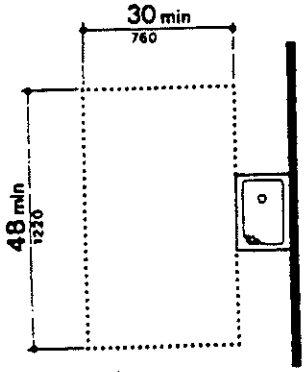
4.17.2 Water Closets. Water closets in accessible stalls shall comply with 4.16.



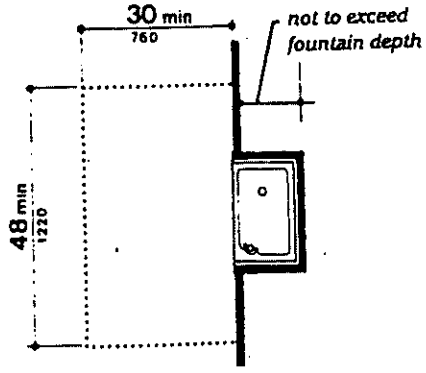
(a)
Spout Height and
Knee Clearance



(b)
Clear Floor Space



(c)
Free-Standing
Fountain or Cooler



(d)
Built-In
Fountain or Cooler

Fig. 27
Drinking Fountains and Water Coolers

4.17 Toilet Stalls

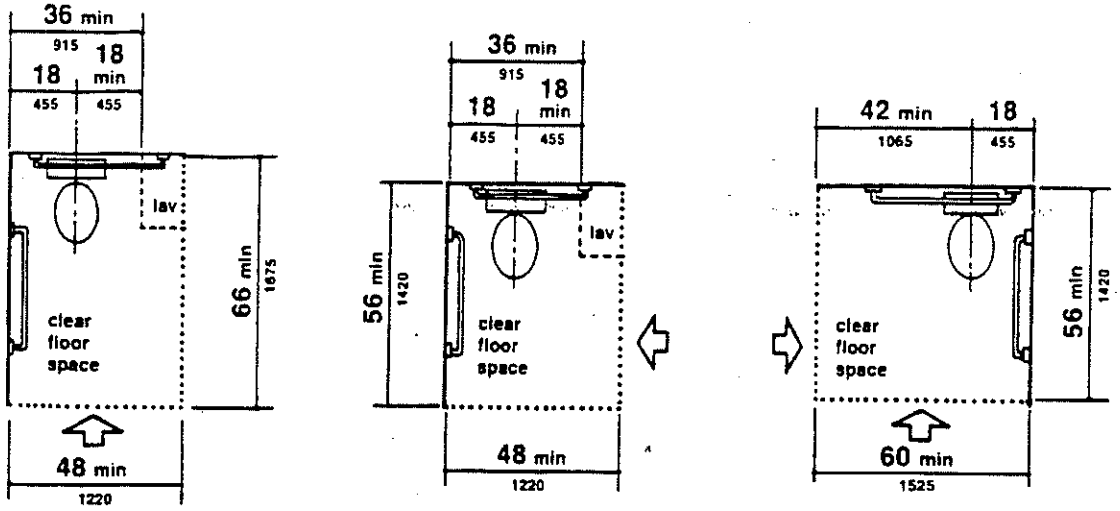


Fig. 28
Clear Floor Space at Water Closets

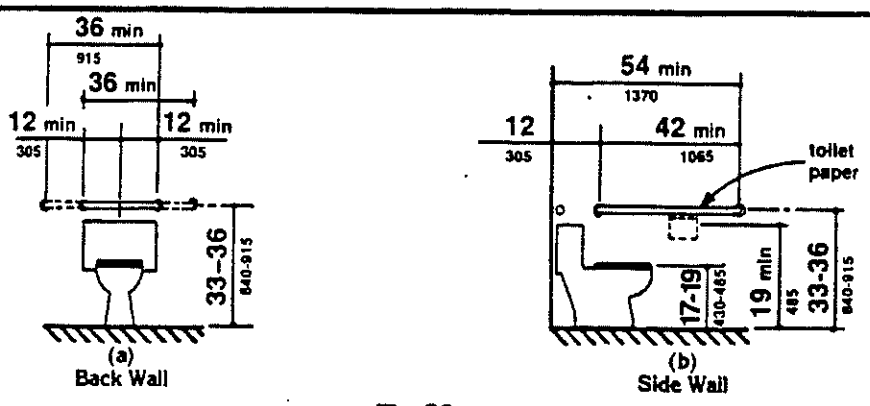


Fig. 29
Grab Bars at Water Closets

4.17.3* Size and Arrangement. The size and arrangement of the standard toilet stall shall comply with Fig. 30(a), *Standard Stall.* Standard toilet stalls with a minimum depth of 56 in (1420 mm) (see Fig. 30(a)) shall have wall-mounted water closets. If the depth of a standard toilet stall is increased at least 3 in (75 mm), then a floor-mounted water closet may be used. Arrangements shown for standard toilet stalls may be reversed to allow either a left- or right-hand approach. Additional stalls shall be provided in conformance with 4.22.4.

EXCEPTION: In instances of alteration work where provision of a standard stall (Fig. 30(a)) is technically infeasible or where plumbing code requirements prevent combining existing stalls to provide space, either alternate stall (Fig. 30(b)) may be provided in lieu of the standard stall.

4.17.4 Toe Clearances. In standard stalls, the front partition and at least one side partition shall provide a toe clearance of at least 9 in (230 mm) above the floor. If the depth of the stall is greater than 60 in (1525 mm), then the toe clearance is not required.

4.17.5* Doors. Toilet stall doors, *including door hardware,* shall comply with 4.13. *If toilet stall approach is from the latch side of the stall door, clearance between the door side of the*

4.17 Toilet Stalls

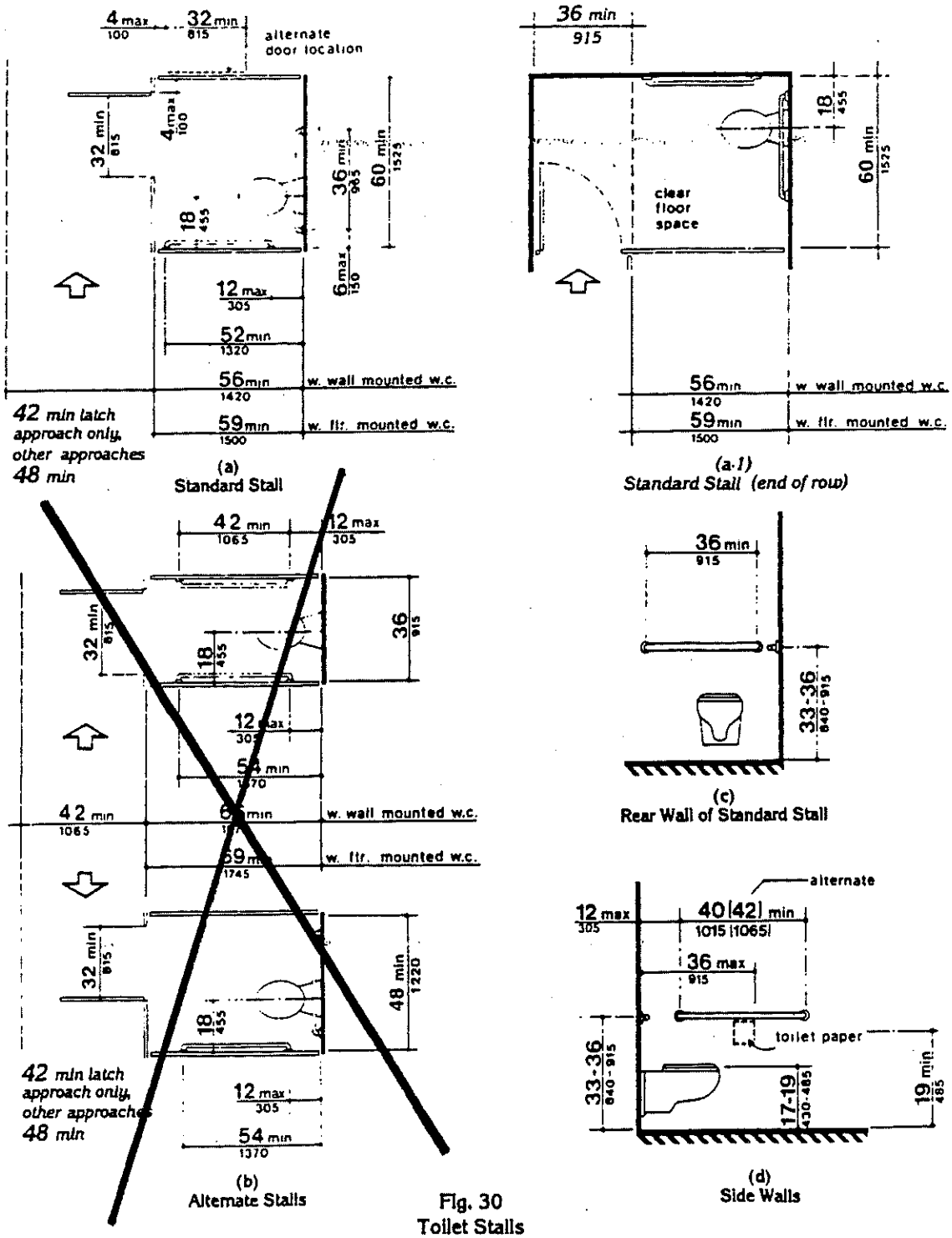


Fig. 30
Toilet Stalls

4.19 Lavatories and Mirrors

stall and any obstruction may be reduced to a minimum of 42 in (1065 mm) (Fig. 30).

4.17.6 Grab Bars. Grab bars complying with the length and positioning shown in Fig. 30(a), (b), (c), and (d) shall be provided. Grab bars may be mounted with any desired method as long as they have a gripping surface at the locations shown and do not obstruct the required clear floor area. Grab bars shall comply with 4.26.

4.18 Urinals.

4.18.1 General. Accessible urinals shall comply with 4.18.

4.18.2 Height. Urinals shall be stall-type or wall-hung with an elongated rim at a maximum of 17 in (430 mm) above the finish floor.

4.18.3 Clear Floor Space. A clear floor space 30 in by 48 in (760 mm by 1220 mm) shall be provided in front of urinals to allow forward approach. This clear space shall adjoin or overlap an accessible route and shall comply with 4.2.4. *Urinal shields that do not extend beyond the front edge of the urinal rim may be provided with 29 in (735 mm) clearance between them.*

4.18.4 Flush Controls. Flush controls shall be hand operated or automatic, and shall comply with 4.27.4, and shall be mounted no more than 44 in (1120 mm) above the finish floor.

4.19 Lavatories and Mirrors.

4.19.1 General. The requirements of 4.19 shall apply to lavatory fixtures, vanities, and built-in lavatories.

4.19.2 Height and Clearances. Lavatories shall be mounted with *the rim or counter surface no higher than 34 in (865 mm) above the finish floor.* Provide a clearance of at least 29 in (735 mm) above the finish floor to the bottom of the apron. Knee and toe clearance shall comply with Fig. 31.

4.19.3 Clear Floor Space. A clear floor space 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 shall be provided in front of a lavatory to allow forward approach. Such clear floor space shall adjoin or overlap an accessible route and shall extend a maximum of 19 in (485 mm) underneath the lavatory (see Fig. 32).

4.19.4 Exposed Pipes and Surfaces. Hot water and drain pipes under lavatories shall be insulated or otherwise *configured to protect against contact.* There shall be no sharp or abrasive surfaces under lavatories.

4.19.5 Faucets. Faucets shall comply with 4.27.4. Lever-operated, push-type, and electronically controlled mechanisms are examples of acceptable designs. *If* self-closing valves are

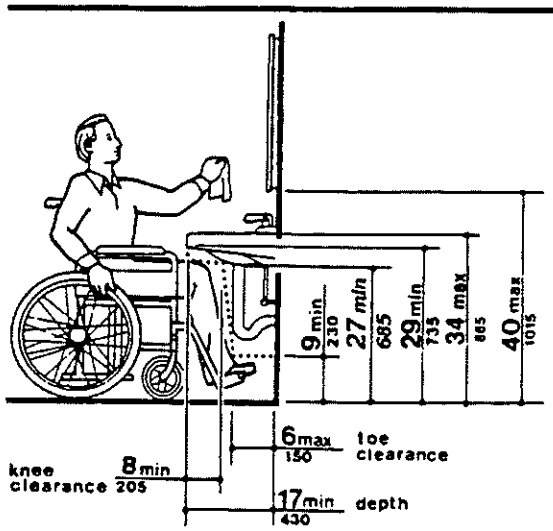


Fig. 31
Lavatory Clearances

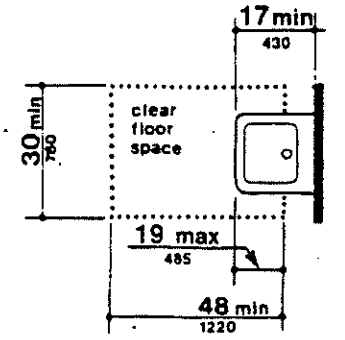


Fig. 32
Clear Floor Space at Lavatories

used the faucet *shall remain* open for at least 10 seconds.

4.19.6* Mirrors. Mirrors shall be mounted with the bottom edge *of the reflecting surface* no higher than 40 in (1015 mm) *above the finish* floor (see Fig. 31).

4.20 Bathtubs.

4.20.1 General. Accessible bathtubs shall comply with 4.20.

4.20.2 Floor Space. Clear floor space in front of bathtubs shall be as shown in Fig. 33.

4.20.3 Seat. An in-tub seat or a seat at the head end of the tub shall be provided as shown in Fig. 33 and 34. The structural strength of seats and their attachments shall comply with 4.26.3. Seats shall be mounted securely and shall not slip during use.

4.20.4 Grab Bars. Grab bars complying with 4.26 shall be provided as shown in Fig. 33 and 34.

4.20.5 Controls. Faucets and other controls complying with 4.27.4 shall be located as shown in Fig. 34.

4.20.6 Shower Unit. A shower spray unit with a hose at least 60 in (1525 mm) long that can be used *both* as a fixed shower head *and* as a hand-held shower shall be provided.

4.20.7 Bathtub Enclosures. If provided, enclosures for bathtubs shall not obstruct controls or transfer from wheelchairs onto bathtub seats or into tubs. Enclosures on bathtubs shall not have tracks mounted on their rims.

4.21 Shower Stalls.

4.21.1* General. Accessible shower stalls shall comply with 4.21.

4.21.2 Size and Clearances. Except as specified in 9.1.2, shower stall size and clear floor space shall comply with Fig. 35(a) or (b). The shower stall in Fig. 35(a) shall be 36 in by 36 in (915 mm by 915 mm). Shower stalls required by 9.1.2 shall comply with Fig. 57(a) or (b). The shower stall in Fig. 35(b) will fit into the space required for a bathtub.

4.21.3 Seat. A seat shall be provided in shower stalls 36 in by 36 in (915 mm by 915 mm) and shall be as shown in Fig. 36. The seat shall be mounted 17 in to 19 in (430 mm to 485 mm) from the bathroom floor and shall extend the full depth of the stall. In a 36 in by 36 in (915 mm by 915 mm) shower stall, the seat shall be on the wall opposite the controls. *Where a fixed seat is provided in a 30 in by 60 in minimum (760 mm by 1525 mm) shower stall, it shall be a folding type and shall be mounted on the wall adjacent to the controls as shown in Fig. 57.* The structural strength of seats and their attachments shall comply with 4.26.3.

4.21.4 Grab Bars. Grab bars complying with 4.26 shall be provided as shown in Fig. 37.

4.21.5 Controls. Faucets and other controls complying with 4.27.4 shall be located as shown in Fig. 37. In shower stalls 36 in by 36 in (915 mm by 915 mm), all controls, faucets, and the shower unit shall be mounted on the side wall opposite the seat.

4.21.6 Shower Unit. A shower spray unit with a hose at least 60 in (1525 mm) long that can be used *both* as a fixed shower head *and* as a hand-held shower shall be provided.

EXCEPTION: In unmonitored facilities where vandalism is a consideration, a fixed shower head mounted at 48 in (1220 mm) above the shower floor may be used in lieu of a hand-held shower head.

4.21.7 Curbs. If provided, curbs in shower stalls 36 in by 36 in (915 mm by 915 mm) shall be no higher than *1/2 in (13 mm).* Shower stalls that are 30 in by 60 in (760 mm by 1525 mm) minimum shall not have curbs.

4.21.8 Shower Enclosures. If provided, enclosures for shower stalls shall not obstruct controls or obstruct transfer from wheelchairs onto shower seats.

4.22 Toilet Rooms.

4.22.1 Minimum Number. *Toilet facilities required to be accessible by 4.1 shall comply*

69.3< (3)

69.35

4.21 Shower Stalls

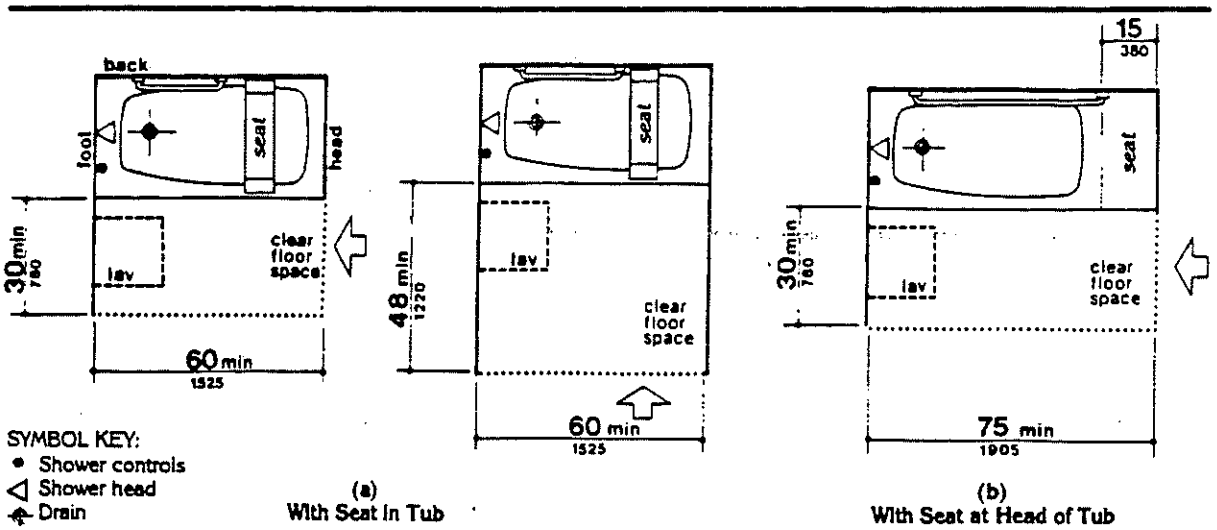


Fig. 33
Clear Floor Space at Bathtubs

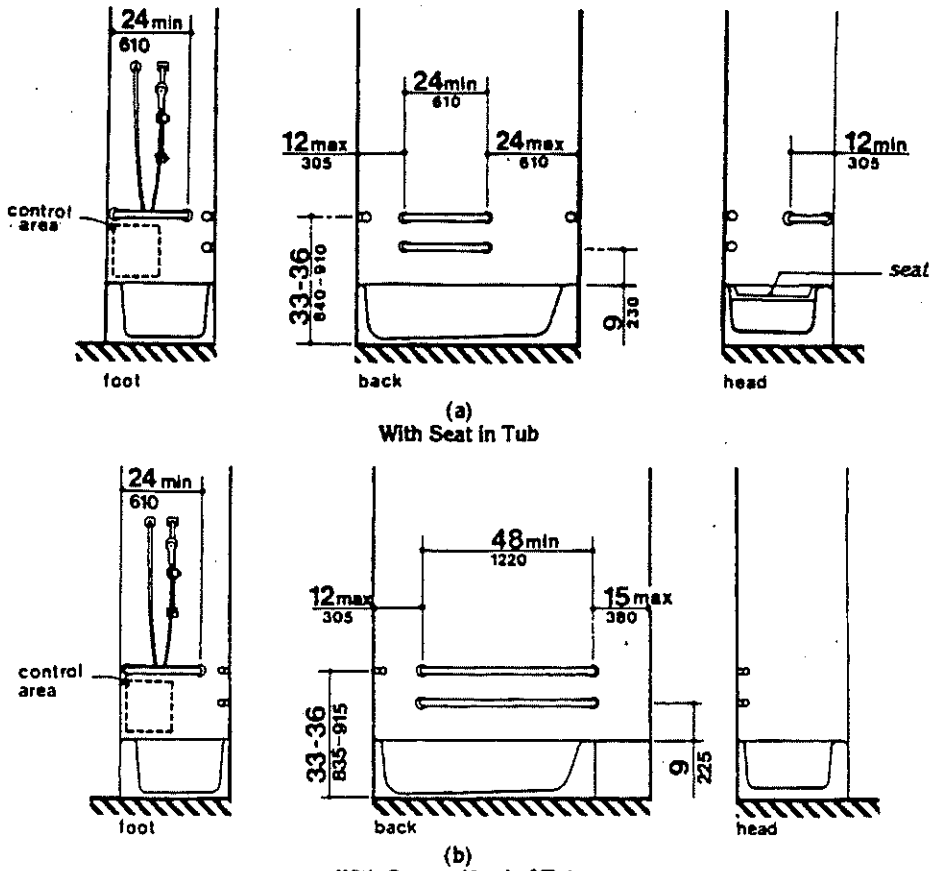


Fig. 34
Grab Bars at Bathtubs

with 4.22. Accessible toilet rooms shall be on an accessible route.

4.22.2 Doors. All doors to accessible toilet rooms shall comply with 4.13. Doors shall not swing into the clear floor space required for any fixture.

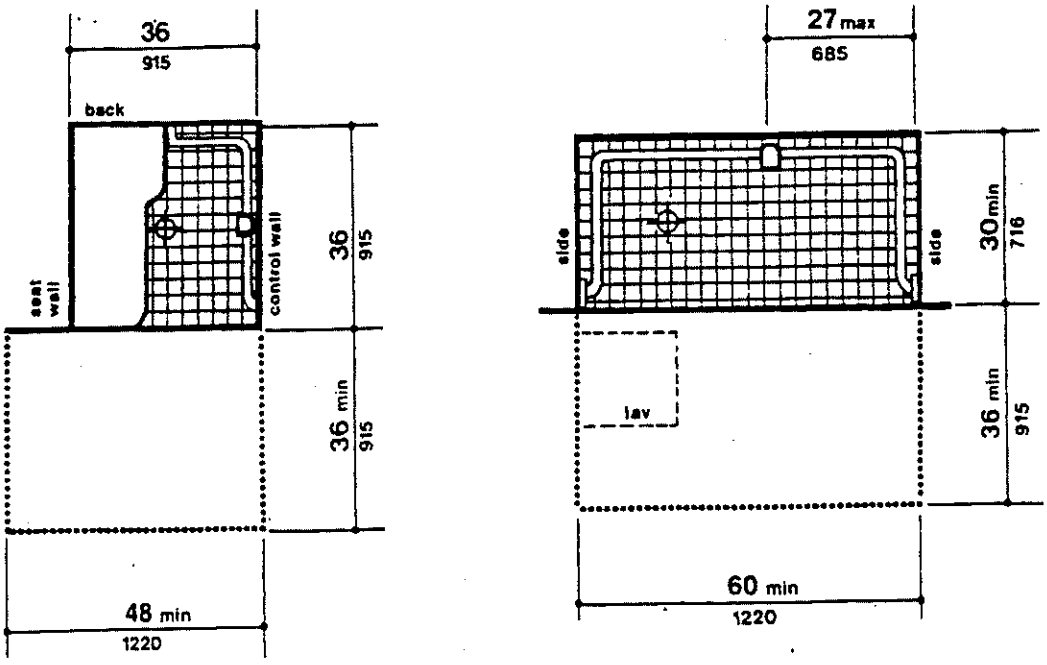
4.22.3* Clear Floor Space. The accessible fixtures and controls required in 4.22.4, 4.22.5, 4.22.6, and 4.22.7 shall be on an accessible route. An unobstructed turning space complying with 4.2.3 shall be provided within an accessible toilet room. The clear floor space at fixtures and controls, the accessible route, and the turning space may overlap.

4.22.4 Water Closets. If toilet stalls are provided, then at least one shall be a standard toilet stall complying with 4.17; *where 6 or more stalls are provided, in addition to the stall complying with 4.17.3, at least one stall 36 in (915 mm) wide with an outward swinging, self-closing door and parallel grab bars complying with Fig. 30(d) and 4.26 shall be provided. Water closets in such stalls* shall comply with 4.16. If water closets are not in stalls, then at least one shall comply with 4.16.

4.22.5 Urinals. If urinals are provided, *then* at least one shall comply with 4.18.

4.22.6 Lavatories and Mirrors. If lavatories and mirrors are provided, *then* at least one of each shall comply with 4.19.

4.22.7 Controls and Dispensers. If controls, dispensers, receptacles, or other



(a)
36-in by 36-in
(915-mm by 915-mm) Stall

(b)
30-in by 60-in
(760-mm by 1525-mm) Stall

Fig. 35
Shower Size and Clearances

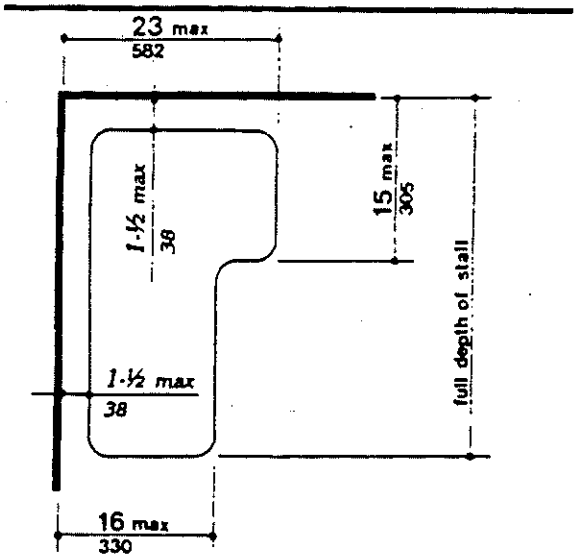


Fig. 36
Shower Seat Design

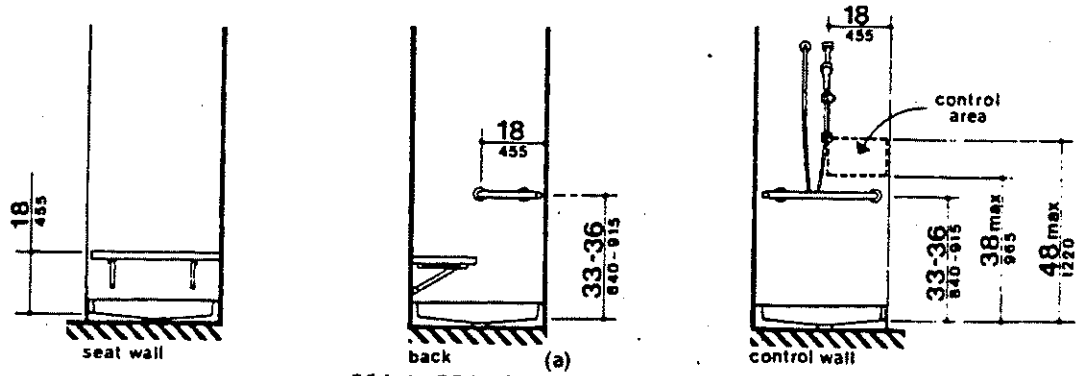
equipment are provided, *then* at least one of each shall be on an accessible route and shall comply with 4.27.

4.23 Bathrooms, Bathing Facilities, and Shower Rooms.

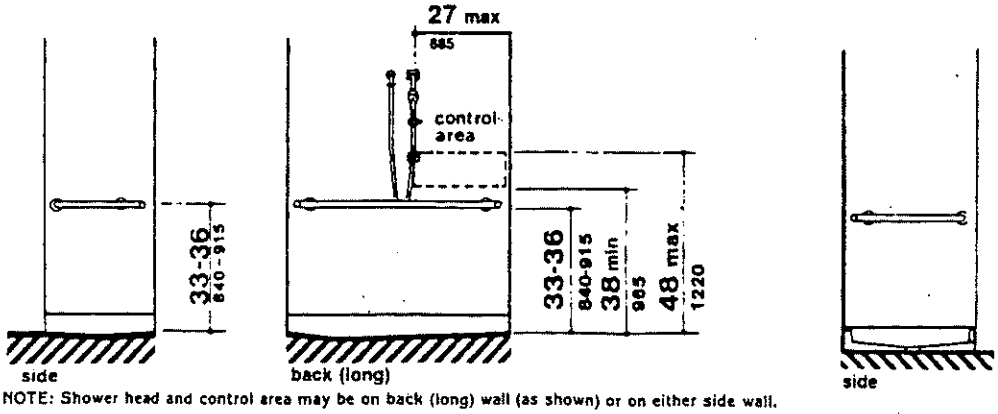
4.23.1 Minimum Number. Bathrooms, bathing facilities, or shower rooms *required to be accessible by 4.1* shall comply with 4.23 and shall be on an accessible route.

4.23.2 Doors. Doors to accessible bathrooms shall comply with 4.13. Doors shall not swing into the floor space required for any fixture.

4.23.3* Clear Floor Space. The accessible fixtures and controls required in 4.23.4, 4.23.5, 4.23.6, 4.23.7, 4.23.8, and 4.23.9 shall be on an accessible route. An unobstructed turning



36-in by 36-in (915-mm by 915-mm) Stall



NOTE: Shower head and control area may be on back (long) wall (as shown) or on either side wall.

(b)
30-in by 60-in (760-mm by 1525-mm) Stall

Fig. 37
Grab Bars at Shower Stalls

space complying with 4.2.3 shall be provided within an accessible bathroom. The clear floor spaces at fixtures and controls, the accessible route, and the turning space may overlap.

4.23.4 Water Closets. If toilet stalls are provided, then at least one shall be a standard toilet stall complying with 4.17; *where 6 or more stalls are provided, in addition to the stall complying with 4.17.3, at least one stall 36 in (915 mm) wide with an outward swinging, self-closing door and parallel grab bars complying with Fig. 30(d) and 4.26 shall be provided. Water closets in such stalls* shall comply with 4.16. If water closets are not in stalls, then at least one shall comply with 4.16.

4.23.5 Urinals. If urinals are provided, then at least one shall comply with 4.18.

4.23.6 Lavatories and Mirrors. If lavatories and mirrors are provided, then at least one of each shall comply with 4.19.

4.23.7 Controls and Dispensers. If controls, dispensers, receptacles, or other equipment *are* provided, *then* at least one of each shall be on an accessible route and shall comply with 4.27.

4.23.8 Bathing and Shower Facilities. If tubs or showers are provided, then at least one accessible tub that complies with 4.20 or at least one accessible shower that complies with 4.21 shall be provided.

4.23.9* Medicine Cabinets. If medicine cabinets are provided, at least one shall be located with a usable shelf no higher than 44 in (1120 mm) above the floor space. The floor space shall comply with 4.2.4.

4.24 Sinks.

4.24.1 General. Sinks *required to be accessible by 4.1* shall comply with 4.24.

4.24.2 Height. Sinks shall be mounted with the counter or rim no higher than 34 in (865 mm) *above the finish* floor.

4.24.3 Knee Clearance. Knee clearance that is at least 27 in (685 mm) high, 30 in (760 mm) wide, and 19 in (485 mm) deep shall be provided underneath sinks.

4.24.4 Depth. Each sink shall be a maximum of 6-1/2 in (165 mm) deep.

4.24.5 Clear Floor Space. A clear floor space at least 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 shall be provided in front of a sink to allow forward approach. The clear floor space shall be on an accessible route and shall extend a maximum of 19 in (485 mm) underneath the sink (see Fig. 32).

4.24.6 Exposed Pipes and Surfaces. Hot water and drain pipes exposed under sinks shall be insulated or otherwise *configured so as to protect against contact.* There shall be no sharp or abrasive surfaces under sinks.

4.24.7 Faucets. Faucets shall comply with 4.27.4. Lever-operated, push-type, touch-type, or electronically controlled mechanisms are acceptable designs.

4.25 Storage.

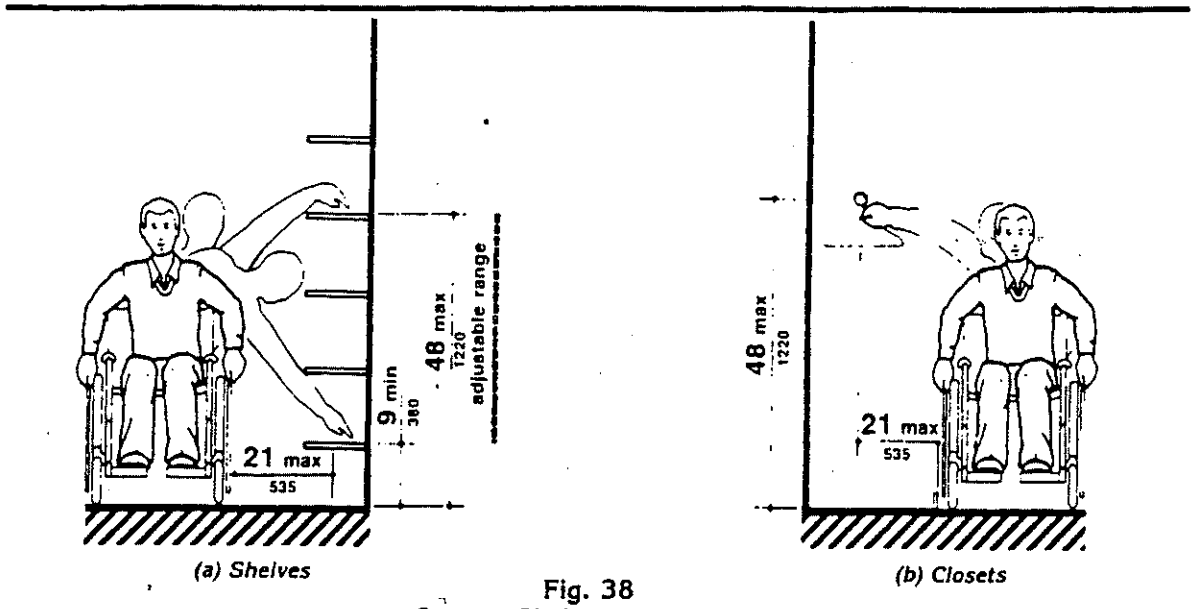
4.25.1 General. *Fixed* storage facilities such as cabinets, shelves, closets, and drawers *required to be accessible by 4.1* shall comply with 4.25.

4.25.2 Clear Floor Space. A clear floor space at least 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 that allows either a forward or parallel approach by a person using a wheelchair shall be provided at accessible storage facilities.

4.25.3 Height. Accessible storage spaces shall be within at least one of the reach ranges specified in 4.2.5 and 4.2.6 *(see Fig. 5 and Fig. 6).* Clothes rods or shelves shall be a maximum of 54 in (1370 mm) *above the finish* floor *for a side approach. Where the distance from the wheelchair to the clothes rod or shelf exceeds 10 in (255 mm) (as in closets without accessible doors) the height and depth to the rod or shelf shall comply with Fig. 38(a) and Fig. 38(b).*

4.25.4 Hardware. Hardware for accessible storage facilities shall comply with 4.27.4. Touch latches and U-shaped pulls are acceptable.

4.26 Handrails, Grab Bars, and Tub and Shower Seats



(a) Shelves (b) Closets

Fig. 38
Storage Shelves and Closets

4.26 Handrails, Grab Bars, and Tub and Shower Seats.

4.26.1* General. All handrails, grab bars, and tub and shower seats *required to be accessible by 4.1, 4.8, 4.9, 4.16, 4.17, 4.20 or 4.21* shall comply with 4.26.

4.26.2* Size and Spacing of Grab Bars and Handrails. The diameter or width of the gripping surfaces of a handrail or grab bar shall be 1-1/4 in to 1-1/2 in (32 mm to 38 mm), or the shape shall provide an equivalent gripping surface. If handrails or grab bars are mounted adjacent to a wall, the space between the wall and the grab bar shall be 1-1/2 in (38 mm) (see Fig. 39(a), (b), (c), and *(e)*). Handrails may be located in a recess if the recess is a maximum of 3 in (75 mm) deep and extends at least 18 in (455 mm) above the top of the rail (see Fig. 39(d)).

4.26.3 Structural Strength. The structural strength of grab bars, tub and shower seats, fasteners, and mounting devices shall meet the following specification:

(1) Bending stress in a grab bar or seat induced by the maximum bending moment from the application of 250 lbf (1112N) shall be less than the allowable stress for the material of the grab bar or seat.

(2) Shear stress induced in a grab bar or seat by the application of 250 lbf (1112N) shall be less than the allowable shear stress for the material of the grab bar or seat. If the connection between the grab bar or seat and its mounting bracket or other support is considered to be fully restrained, then direct and torsional shear stresses shall be totaled for the combined shear stress, which shall not exceed the allowable shear stress.

(3) Shear force induced in a fastener or mounting device from the application of 250 lbf (1112N) shall be less than the allowable lateral load of either the fastener or mounting device or the supporting structure, whichever is the smaller allowable load.

(4) Tensile force induced in a fastener by a direct tension force of 250 lbf (1112N) plus the maximum moment from the application of 250 lbf (1112N) shall be less than the allowable withdrawal load between the fastener and the supporting structure.

(5) Grab bars shall not rotate within their fittings.

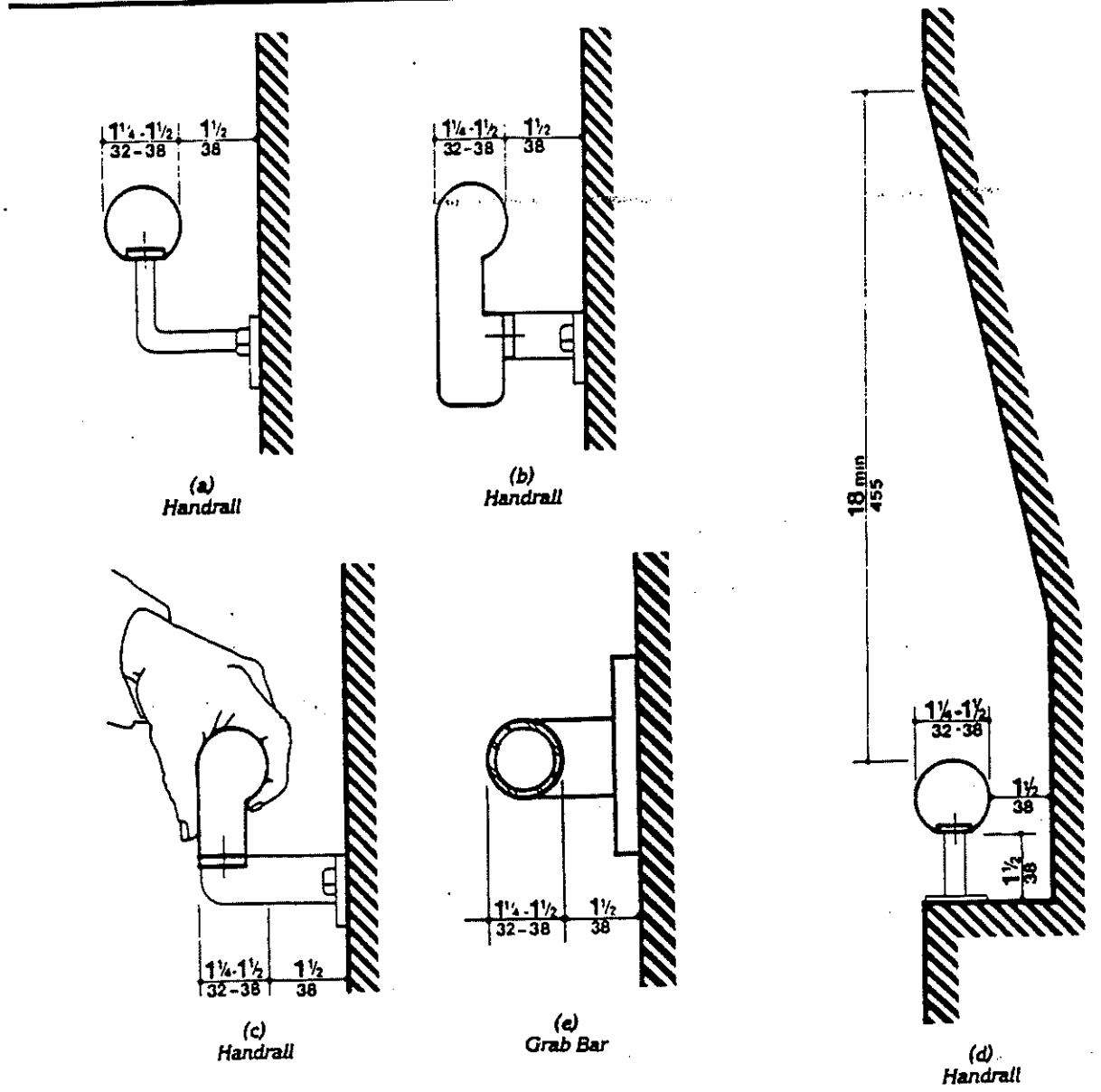


Fig. 39
Size and Spacing of Handrails and Grab Bars

4.26.4 Eliminating Hazards. A handrail or grab bar and any wall or other surface adjacent to it shall be free of any sharp or abrasive elements. Edges shall have a minimum radius of 1/8 in (3.2 mm).

4.27 Controls and Operating Mechanisms.

4.27.1 General. Controls and operating mechanisms *required to be accessible by 4.1* shall comply with 4.27.

4.28 Alarms

4.27.2 Clear Floor Space. Clear floor space complying with 4.2.4 that allows a forward or a parallel approach by a person using a wheelchair shall be provided at controls, dispensers, receptacles, and other operable equipment.

4.27.3* Height. The highest operable part of controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in 4.2.5 and 4.2.6. Electrical and communications system receptacles on walls shall be mounted no less than 15 in (380 mm) above the floor.

EXCEPTION: These requirements do not apply where the use of special equipment dictates otherwise or where electrical and communications systems receptacles are not normally intended for use by building occupants.

4.27.4 Operation. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N).

4.28 Alarms.

4.28.1 General. *Alarm systems required to be accessible by 4.1 shall comply with 4.28. At a minimum, visual signal appliances shall be provided in buildings and facilities in each of the following areas: restrooms and any other general usage areas (e.g., meeting rooms), hallways, lobbies, and any other area for common use.*

4.28.2* Audible Alarms. If provided, audible emergency alarms shall produce a sound that exceeds the prevailing equivalent sound level in the room or space by at least 15 *dbA* or exceeds any maximum sound level with a duration of 60 seconds by 5 *dbA*, whichever is louder. Sound levels for alarm signals shall not exceed 120 *dbA*.

4.28.3* Visual Alarms. *Visual alarm signal appliances shall be integrated into the building or facility alarm system. If single station audible alarms are provided then single station visual alarm signals shall be provided. Visual alarm signals shall have the following minimum photometric and location features:*

(1) The lamp shall be a xenon strobe type or equivalent.

(2) The color shall be clear or nominal white (i.e., unfiltered or clear filtered white light).

(3) The maximum pulse duration shall be two-tenths of one second (0.2 sec) with a maximum duty cycle of 40 percent. The pulse duration is defined as the time interval between initial and final points of 10 percent of maximum signal.

(4) The intensity shall be a minimum of 75 candela.

(5) The flash rate shall be a minimum of 1 Hz and a maximum of 3 Hz.

(6) The appliance shall be placed 80 in (2030 mm) above the highest floor level within the space or 6 in (152 mm) below the ceiling, whichever is lower.

(7) In general, no place in any room or space required to have a visual signal appliance shall be more than 50 ft (15 m) from the signal (in the horizontal plane). In large rooms and spaces exceeding 100 ft (30 m) across, without obstructions 6 ft (2 m) above the finish floor, such as auditoriums, devices may be placed around the perimeter, spaced a maximum 100 ft (30 m) apart, in lieu of suspending appliances from the ceiling.

(8) No place in common corridors or hallways in which visual alarm signalling appliances are required shall be more than 50 ft (15 m) from the signal.

4.28.4* Auxiliary Alarms. *Units and* sleeping accommodations shall have a visual alarm connected to the building emergency alarm system or shall have a standard 110-volt electrical receptacle into which such an alarm can be connected *and a means by which a signal from the building emergency alarm system can trigger such an auxiliary alarm. When visual alarms are in place the signal shall be visible in all areas of the unit or room.* Instructions for use of the auxiliary alarm or receptacle shall be provided.

4.29 *Detectable* Warnings.

4.29.1 General. *Detectable* warnings *required by 4.1 and 4.7* shall comply with 4.29.

4.29.2* *Detectable* Warnings on Walking Surfaces. *Detectable* warnings shall consist *of raised truncated domes with a diameter of nominal 0.9 in (23 mm), a height of nominal 0.2 in (5 mm) and a center-to-center spacing of nominal 2.35 in (60 mm)* and shall contrast *visually with adjoining surfaces, either light-on-dark, or dark-on-light.*

The material used to provide contrast shall be an integral part of the walking surface. Detectable warnings used on interior surfaces shall differ from adjoining walking surfaces in resiliency or sound-on-cane contact.

4.29.3 *Detectable* Warnings on Doors To Hazardous Areas. *(Reserved).*

4.29.4 *Detectable* Warnings at Stairs. *(Reserved).*

4.29.5 *Detectable* Warnings at Hazardous Vehicular Areas. If a walk crosses or adjoins a vehicular way, *and the walking surfaces are not separated by* curbs, railings, or other elements *between the pedestrian areas and vehicular areas*, the boundary between the areas shall be defined by a continuous *detectable* warning *which is* 36 in (915 mm) wide, complying with 4.29.2.

4.29.6 *Detectable* Warnings at Reflecting Pools. The edges of reflecting pools shall be protected by railings, walls, curbs, or *detectable* warnings complying with 4.29.2.

4.29.7 Standardization. *(Reserved).*

4.30 Signage.

4.30.1* General. Signage *required to be accessible by 4.1 shall comply with the applicable provisions of 4.30.*

4.30.2* Character Proportion. Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and 1:10.

4.30.3 Character Height. *Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted.*

Height Above Finished Floor	*Minimum Character Height*
Suspended or Projected Overhead in compliance with 4.4.2	*3 in (75 mm) minimum*

4.30.4* Raised *and Brailled* Characters *and Pictorial Symbol Signs (Pictograms).* Letters and numerals shall be raised 1/32 in (0.8 mm) minimum, *upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille.* Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm). *Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimension of the pictogram shall be 6 in (152 mm) minimum in height.*

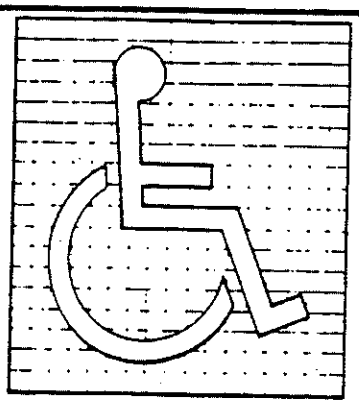
4.30.5* Finish and Contrast. *The characters and background of signs shall be eggshell, matte, or other non-glare finish.* Characters and symbols shall contrast with their background — either light characters on a dark background or dark characters on a light background.

4.30.6 Mounting Location and Height. *Where permanent identification is provided for rooms and spaces, signs shall be installed on the wall adjacent to the latch side of the door. Where there is no wall space to the latch side of the door, including at double leaf doors, signs shall be placed on the nearest adjacent wall. Mounting height shall be 60 in (1525 mm) above the finish floor to the centerline of the sign. Mounting location for such signage shall be so that a person may approach within 3 in (76 mm) of signage without encountering protruding objects or standing within the swing of a door.*

4.30.7* Symbols of Accessibility.

(1) Facilities and elements required to be identified as accessible by 4.1 shall use the international symbol of accessibility. The

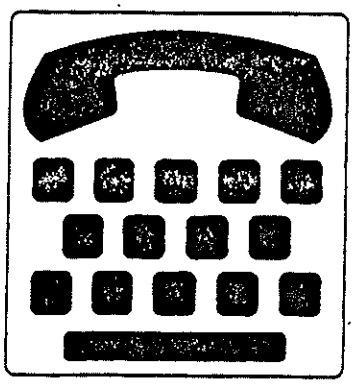
4.30 Signage



(a)
Proportions
International Symbol of Accessibility



(b)
Display Conditions
International Symbol of Accessibility



(c)
International TDD Symbol



(d)
International Symbol of Access for Hearing Loss

Fig. 43
International Symbols

symbol shall be displayed as shown in Fig. 43*(a) and (b)*.

(2) Volume Control Telephones. Telephones required to have a volume control by 4.1.3(17)(b) shall be identified by a sign containing a depiction of a telephone handset with radiating sound waves.

(3) Text Telephones. Text telephones required by 4.1.3 (17)(c) shall be identified by the international TDD symbol (Fig 43(c)). In addition, if a facility has a public text telephone, directional signage indicating the location of the nearest text telephone shall be placed adjacent to all banks of telephones which do not contain a text telephone. Such directional signage shall include the international TDD symbol. If a facility has no banks of telephones, the directional signage shall be provided at the entrance (e.g., in a building directory).

(4) Assistive Listening Systems. In assembly areas where permanently installed assistive listening systems are required by 4.1.3(19)(b) the availability of such systems shall be identified with signage that includes the international symbol of access for hearing loss (Fig 43(d)).

4.30.8* Illumination Levels. *(Reserved).*

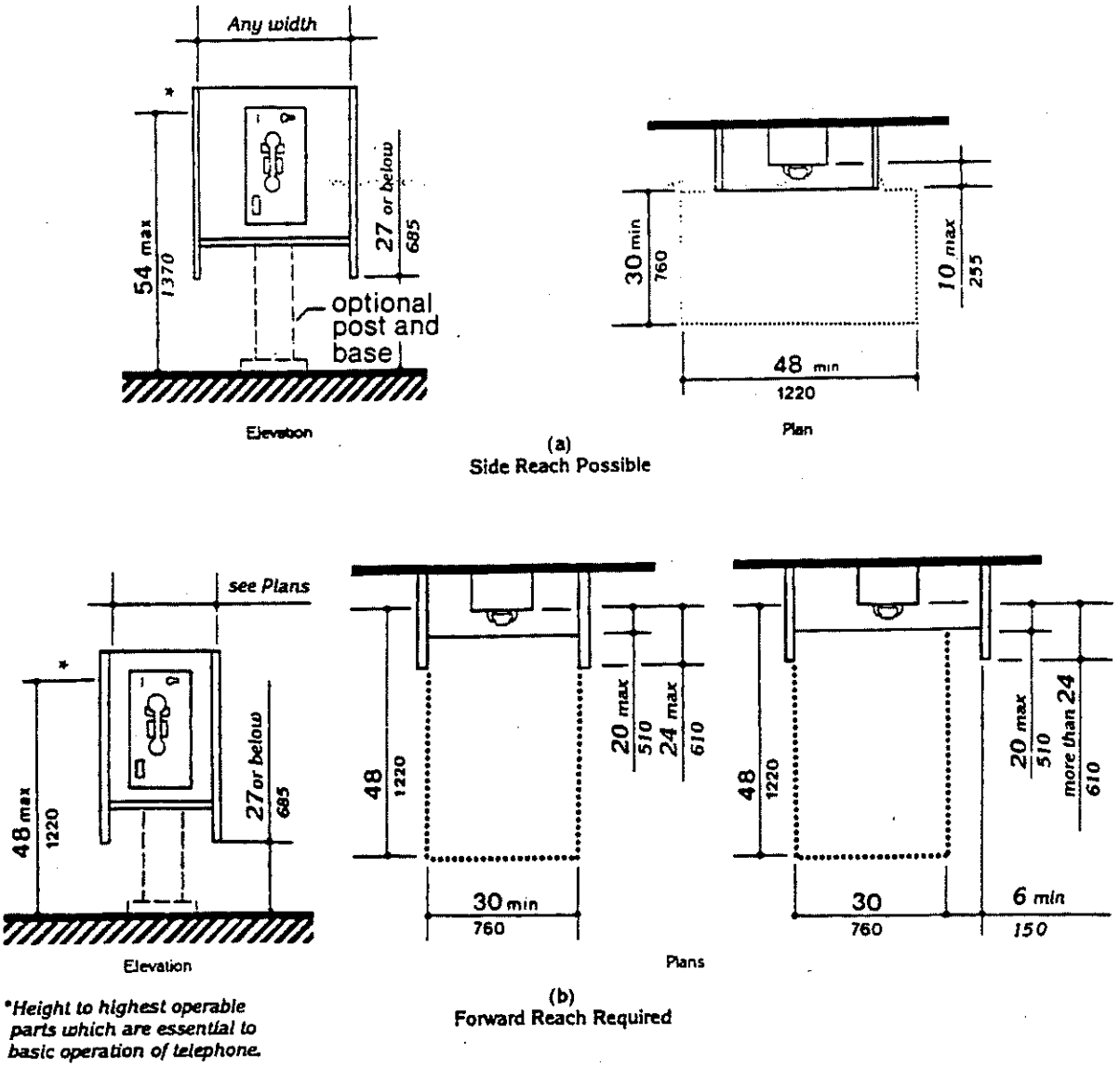
4.31 Telephones.

4.31.1 General. Public telephones *required to be accessible by 4.1* shall comply with 4.31.

4.31.2 Clear Floor or Ground Space. A clear floor or ground space at least 30 in by 48 in (760 mm by 1220 mm) that allows either a forward or parallel approach by a person using a wheelchair shall be provided at telephones (see Fig. 44). The clear floor or ground space shall comply with 4.2.4. Bases, enclosures,.and fixed seats shall not impede approaches to telephones by people who use wheelchairs.

4.31.3* Mounting Height. The highest operable part of the telephone shall be within the reach ranges specified in 4.2.5 or 4.2.6.

4.31.4 *Protruding Objects.* *Telephones shall comply with 4.4.*



*Height to highest operable parts which are essential to basic operation of telephone.

Fig. 44
Mounting Heights and Clearances for Telephones

4.31.5 *Hearing Aid Compatible and Volume Control Telephones Required by 4.1.*

(1) Telephones shall be hearing aid compatible.

(2) Volume controls, *capable of a minimum of 12 dbA and a maximum of 18 dbA above normal, shall be provided in accordance with 4.1.3. If an automatic reset is provided then 18 dbA may be exceeded.*

4.31.6 Controls. Telephones shall have pushbutton controls where service for such equipment is available.

4.31.7 Telephone Books. Telephone books, if provided, shall be located *in a position that complies with the reach ranges specified in 4.2.5 and 4.2.6.*

4.31.8 Cord Length. The cord from the telephone to the handset shall be at least 29 in (735 mm) long.

4.31.9* Text Telephones Required by 4.1.

(1) Text telephones used with a pay telephone shall be permanently affixed within, or adjacent to, the telephone enclosure. If an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the text telephone and the telephone receiver.

(2) Pay telephones designed to accommodate a portable text telephone shall be equipped with a shelf and an electrical outlet within or adjacent to the telephone enclosure. The telephone handset shall be capable of being placed flush on the surface of the shelf. The shelf shall be capable of accommodating a text telephone and shall have 6 in (152 mm) minimum vertical clearance in the area where the text telephone is to be placed.

(3) Equivalent facilitation may be provided. For example, a portable text telephone may be made available in a hotel at the registration desk if it is available on a 24-hour basis for use with nearby public pay telephones. In this instance, at least one pay telephone shall comply with paragraph 2 of this section. In addition, if an acoustic coupler is used, the telephone handset cord shall be sufficiently long so as to allow connection of the text telephone and the telephone receiver. Directional signage shall be provided and shall comply with 4.30.7.

4.32 *Fixed or Built-in* Seating and Tables.

4.32.1 Minimum Number. Fixed or built-in seating or tables *required to be accessible by* 4.1 shall comply with 4.32.

4.32.2 Seating. If seating spaces for people in wheelchairs are provided at *fixed* tables or counters, clear floor space complying with 4.2.4 shall be provided. Such clear floor space shall not overlap knee space by more than 19 in (485 mm) (see Fig. 45).

4.32.3 Knee Clearances. If seating for people in wheelchairs is provided at tables *or* counters, knee spaces at least 27 in (685 mm) high, 30 in (760 mm) wide, and 19 in (485 mm) deep shall be provided (see Fig. 45).

4.32.4* Height of Tables or Counters. The tops of *accessible* tables and *counters* shall be from 28 in to 34 in (710 mm to 865 mm) *above the finish* floor or ground.

4.33 Assembly Areas.

4.33.1 Minimum Number. Assembly *and associated* areas *required to be accessible by 4.1 shall comply with 4.33.*

4.33.2* Size of Wheelchair Locations. Each wheelchair location shall provide minimum clear ground or floor spaces as shown in Fig. 46.

4.33.3* Placement of Wheelchair Locations. Wheelchair areas shall be an integral part of any fixed seating plan and shall be *provided so as to provide people with physical disabilities a choice of admission prices and lines of sight comparable to those for members of the general public.* They shall adjoin an accessible route that also serves as a means of egress in case of emergency. *At least one companion fixed seat shall be provided next to each wheelchair seating area. When the seating capacity exceeds 300, wheelchair spaces shall be provided in more than one location. Readily removable seats may be installed in wheelchair spaces when the spaces are not required to accommodate wheelchair users.*

EXCEPTION: Accessible viewing positions may be clustered for bleachers, balconies, and other areas having sight lines that require slopes of greater than 5 percent. Equivalent accessible viewing positions may be located on levels having accessible egress.

4.33.4 Surfaces. The ground or floor at wheelchair locations shall be level and shall comply with 4.5.

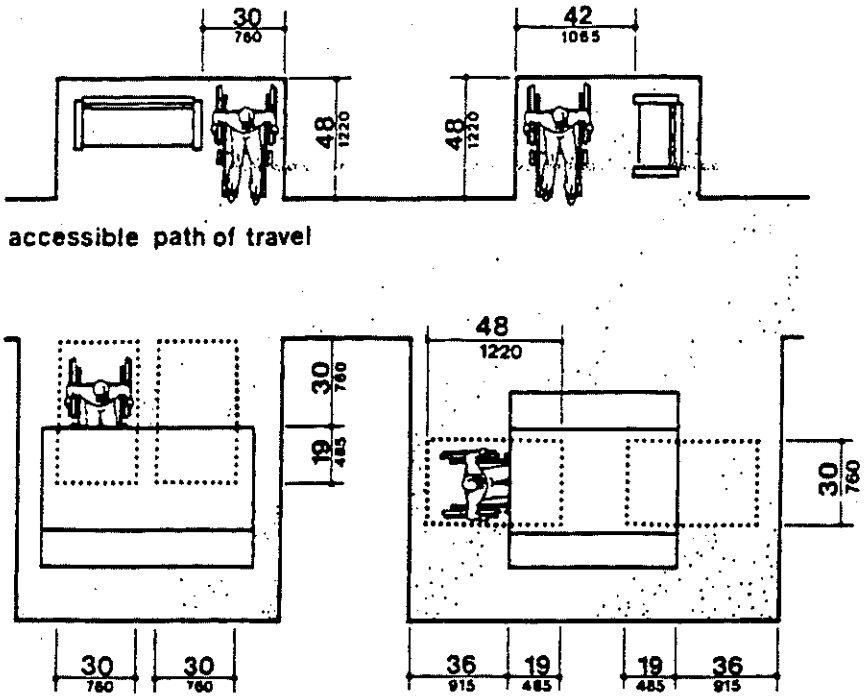


Fig. 45
Minimum Clearances for Seating and Tables

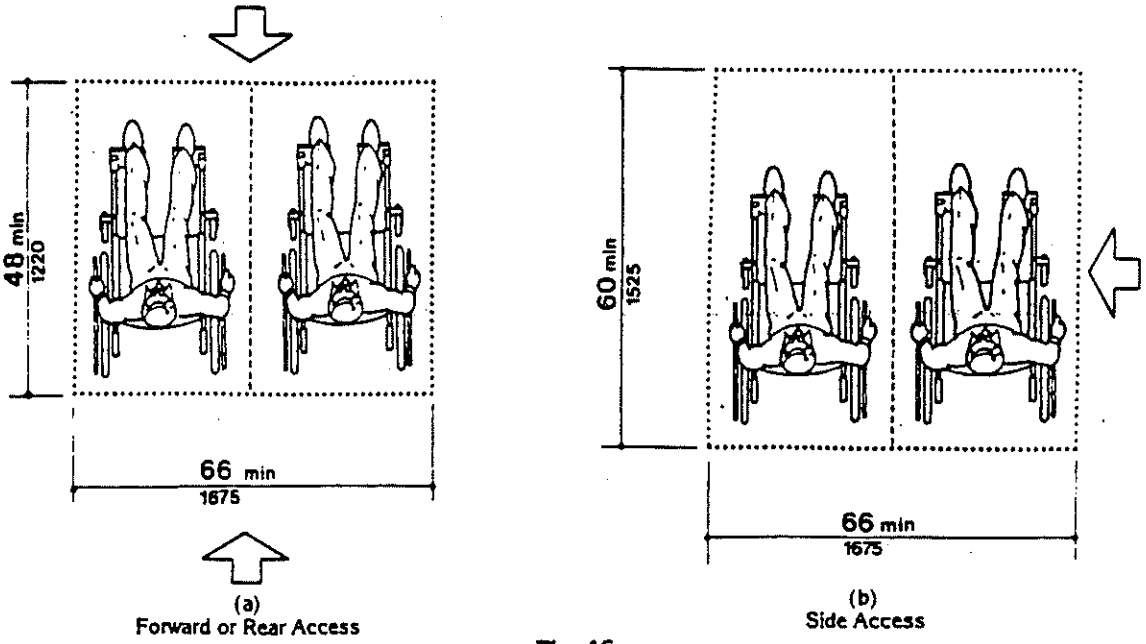


Fig. 46
Space Requirements for Wheelchair
Seating Spaces in Series

4.34 Automated Teller Machines

4.33.5 Access to Performing Areas. An accessible route shall connect wheelchair seating locations with performing areas, including stages, arena floors, dressing rooms, locker rooms, and other spaces used by performers.

4.33.6* Placement of Listening Systems. If the listening system provided serves individual fixed seats, then such seats shall be located within a 50 ft (15 m) viewing distance of the stage or playing area and shall have a complete view of the stage or playing area.

4.33.7* Types of Listening Systems. *Assistive listening systems (ALS) are intended to augment standard public address and audio systems by providing signals which can be received directly by persons with special receivers or their own hearing aids and which eliminate or filter background noise. The type of assistive listening system appropriate for a particular application depends on the characteristics of the setting, the nature of the program, and the intended audience. Magnetic induction loops, infra-red and radio frequency systems are types of listening systems which are appropriate for various applications.*

4.34 Automated Teller Machines.

4.34.1 General. *Each machine required to be accessible by 4.1.3 shall be on an accessible route and shall comply with 4.34.*

4.34.2 Controls. *Controls for user activation shall comply with the requirements of 4.27.*

4.34.3 Clearances and Reach Range. *Free standing or built-in units not having a clear space under them shall comply with 4.27.2 and 4.27.3 and provide for a parallel approach and both a forward and side reach to the unit allowing a person in a wheelchair to access the controls and dispensers.*

4.34.4 Equipment for Persons with Vision Impairments. *Instructions and all information for use shall be made accessible to and independently usable by persons with vision impairments.*

4.35 Dressing and Fitting Rooms.

4.35.1 General. *Dressing and fitting rooms required to be accessible by 4.1 shall comply with 4.35 and shall be on an accessible route.*

4.35.2 Clear Floor Space. *A clear floor space allowing a person using a wheelchair to make a 180-degree turn shall be provided in every accessible dressing room entered through a swinging or sliding door. No door shall swing into any part of the turning space. Turning space shall not be required in a private dressing room entered through a curtained opening at least 32 in (815 mm) wide if clear floor space complying with section 4.2 renders the dressing room usable by a person using a wheelchair.*

4.35.3 Doors. *All doors to accessible dressing rooms shall be in compliance with section 4.13.*

4.35.4 Bench. *Every accessible dressing room shall have a 24 in by 48 in (610 mm by 1220 mm) bench fixed to the wall along the longer dimension. The bench shall be mounted 17 in to 19 in (430 mm to 485 mm) above the finish floor. Clear floor space shall be provided alongside the bench to allow a person using a wheelchair to make a parallel transfer onto the bench. The structural strength of the bench and attachments shall comply with 4.26.3. Where installed in conjunction with showers, swimming pools, or other wet locations, water shall not accumulate upon the surface of the bench and the bench shall have a slip-resistant surface.*

4.35.5 Mirror. *Where mirrors are provided in dressing rooms of the same use, then in an accessible dressing room, a full-length mirror, measuring at least 18 in wide by 54 in high (460 mm by 1370 mm), shall be mounted in a position affording a view to a person on the bench as well as to a person in a standing position.*

NOTE: Sections 4.1.1 through 4.1.7 and sections 5 through 10 are different from ANSI A117.1 in their entirety and are printed in standard type.

69.39 (1)

5. RESTAURANTS AND CAFETERIAS.

5.1* General. Except as specified or modified in this section, restaurants and cafeterias shall comply with the requirements of 4.1 to 4.35. Where fixed tables (or dining counters where food is consumed but there is no service) are provided, at least 5 percent, but not less than one, of the fixed tables (or a portion of the dining counter) shall be accessible and shall comply with 4.32 as required in 4.1.3(18). In establishments where separate areas are designated for smoking and non-smoking patrons, the required number of accessible fixed tables (or counters) shall be proportionally distributed between the smoking and non-smoking areas. In new construction, and where practicable in alterations, accessible fixed tables (or counters) shall be distributed throughout the space or facility.

5.2 Counters and Bars. Where food or drink is served at counters exceeding 34 in (865 mm) in height for consumption by customers seated on stools or standing at the counter, a portion of the main counter which is 60 in (1525 mm) in length minimum shall be provided in compliance with 4.32 or service shall be available at accessible tables within the same area.

5.3 Access Aisles. All accessible fixed tables shall be accessible by means of an access aisle at least 36 in (915 mm) clear between parallel edges of tables or between a wall and the table edges.

5.4 Dining Areas. In new construction, all dining areas, including raised or sunken dining areas, loggias, and outdoor seating areas, shall be accessible. In non-elevator buildings, an accessible means of vertical access to the mezzanine is not required under the following conditions: 1) the area of mezzanine seating measures no more than 33 percent of the area of the total accessible seating area; 2) the same services and decor are provided in an accessible space usable by the general public; and, 3) the accessible areas are not restricted to use by people with disabilities. In alterations, accessibility to raised or sunken dining areas, or to all parts of outdoor seating areas is not required provided that the same services and decor are provided in an accessible space usable by the general public and are not restricted to use by people with disabilities.

5.5 Food Service Lines. Food service lines shall have a minimum clear width of 36 in (915 mm), with a preferred clear width of 42 in (1065 mm) to allow passage around a person using a wheelchair. Tray slides shall be mounted no higher than 34 in (865 mm) above the floor (see Fig. 53). If self-service shelves

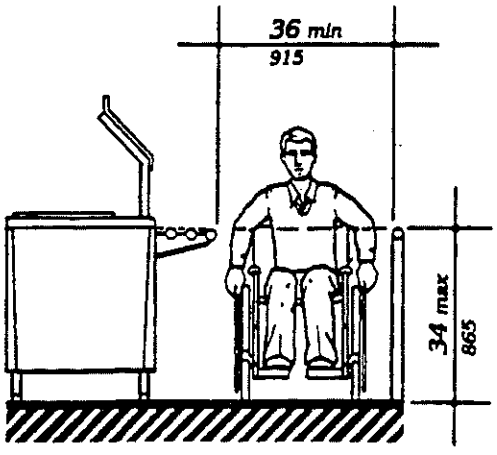


Fig. 53
Food Service Lines

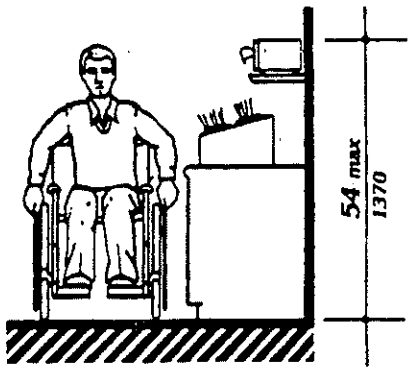


Fig. 54
Tableware Areas

are provided, at least 50 percent of each type must be within reach ranges specified in 4.2.5 and 4.2.6.

5.6 Tableware and Condiment Areas. Self-service shelves and dispensing devices for tableware, dishware, condiments, food and beverages shall be installed to comply with 4.2 (see Fig. 54).

5.7 Raised Platforms. In banquet rooms or spaces where a head table or speaker's lectern is located on a raised platform, the platform shall be accessible in compliance with 4.8 or 4.11. Open edges of a raised platform shall be protected by placement of tables or by a curb.

5.8 Vending Machines and Other Equipment. Spaces for vending machines and other equipment shall comply with 4.2 and shall be located on an accessible route.

5.9 Quiet Areas. (Reserved).

6. MEDICAL CARE FACILITIES.

6.1 General. Medical care facilities included in this section are those in which people receive physical or medical treatment or care and where persons may need assistance in responding to an emergency and where the period of stay may exceed twenty-four hours. In addition to the requirements of 4.1 through 4.35, medical care facilities and buildings shall comply with 6.

(1) Hospitals - general purpose hospitals, psychiatric facilities, detoxification facilities — At least 10 percent of patient bedrooms and toilets, and all public use and common use areas are required to be designed and constructed to be accessible.

(2) Hospitals and rehabilitation facilities that specialize in treating conditions that affect mobility, or units within either that specialize in treating conditions that affect mobility — All patient bedrooms and toilets, and all public use and common use areas are required to be designed and constructed to be accessible.

(3) Long term care facilities, nursing homes — At least 50 percent of patient bedrooms and toilets, and all public use and common use areas are required to be designed and constructed to be accessible.

(4) Alterations to patient bedrooms.

(a) When patient bedrooms are being added or altered as part of a planned renovation of an entire wing, a department, or other discrete area of an existing medical facility, a percentage of the patient bedrooms that are being added or altered shall comply with 6.3. The percentage of accessible rooms provided shall be consistent with the percentage of rooms required to be accessible by the applicable requirements of 6.1(1), 6.1(2), or 6.1(3), until the number of accessible patient bedrooms in the facility equals the overall number that would be required if the facility were newly constructed. (For example, if 20 patient bedrooms are being altered in the obstetrics department of a hospital, 2 of the altered rooms must be made accessible. If, within the same hospital, 20 patient bedrooms are being altered in a unit that specializes in treating mobility impairments, all of the altered rooms must be made accessible.) Where toilet/bath rooms are part of patient bedrooms which are added or altered and required to be accessible, each such patient toilet/bathroom shall comply with 6.4.

(b) When patient bedrooms are being added or altered individually, and not as part of an alteration of the entire area, the altered patient bedrooms shall comply with 6.3, unless either: a) the number of accessible rooms provided in the department or area containing the altered patient bedroom equals the number of accessible patient bedrooms that would be required if the percentage requirements of 6.1(1), 6.1(2), or 6.1(3) were applied to that department or area; or b) the number of accessible patient bedrooms in the facility equals the overall number that would be required if the facility were newly constructed. Where toilet/bathrooms are part of patient bedrooms which are added or altered and required to be accessible, each such toilet/bathroom shall comply with 6.4.

6.2 Entrances. At least one accessible entrance that complies with 4.14 shall be protected from the weather by canopy or roof overhang. Such entrances shall incorporate a passenger loading zone that complies with 4.6.6.

6.3 Patient Bedrooms. Provide accessible patient bedrooms in compliance with 4.1 through 4.35. Accessible patient bedrooms shall comply with the following:

(1) Each bedroom shall have a door that complies with 4.13.

EXCEPTION: Entry doors to acute care hospital bedrooms for in-patients shall be exempted from the requirement in 4.13.6 for maneuvering space at the latch side of the door if the door is at least 44 in (1120 mm) wide.

(2) Each bedroom shall have adequate space to provide a maneuvering space that complies with 4.2.3. In rooms with 2 beds, it is preferable that this space be located between beds.

(3) Each bedroom shall have adequate space to provide a minimum clear floor space of 36 in (915 mm) along each side of the bed and to provide an accessible route complying with 4.3.3 to each side of each bed.

6.4 Patient Toilet Rooms. Where toilet/bath rooms are provided as a part of a patient bedroom, each patient bedroom that is required to be accessible shall have an accessible toilet/bath room that complies with 4.22 or 4.23 and shall be on an accessible route.

7. BUSINESS AND MERCANTILE.

7.1 General. In addition to the requirements of 4.1 to 4.35, the design of all areas used for business transactions with the public shall comply with 7.

7.2 Sales and Service Counters, Teller Windows, Information Counters.

(1) In department stores and miscellaneous retail stores where counters have cash registers and are provided for sales or distribution of goods or services to the public, at least one of each type shall have a portion of the counter which is at least 36 in (915 mm) in length with a maximum height of 36 in (915 mm) above the finish floor. It shall be on an accessible route complying with 4.3. The accessible counters must be dispersed throughout the building or facility. In alterations where it is technically infeasible to provide an accessible counter, an auxiliary counter meeting these requirements may be provided.

(2) At ticketing counters, teller stations in a bank, registration counters in hotels and motels, box office ticket counters, and other counters that may not have a cash register but at which goods or services are sold or distributed, either:

(i) a portion of the main counter which is a minimum of 36 in (915 mm) in length shall be provided with a maximum height of 36 in (915 mm); or

(ii) an auxiliary counter with a maximum height of 36 in (915 mm) in close proximity to the main counter shall be provided; or

(iii) equivalent facilitation shall be provided (e.g., at a hotel registration counter, equivalent facilitation might consist of: (1) provision of a folding shelf attached to the main counter on which an individual with disabilities can write, and (2) use of the space on the side of the counter or at the concierge desk, for handing materials back and forth).

All accessible sales and service counters shall be on an accessible route complying with 4.3.

(3)* Assistive Listening Devices. (Reserved)

8.0 Libraries

7.3* Check-out Aisles.

(1) In new construction, accessible check-out aisles shall be provided in conformance with the table below:

Total Check-out Aisles of Each Design	Minimum Number of Accessible Check-out Aisles (of each design)
1 - 4	1
5 - 8	2
9 - 15	3
over 15	3, plus 20% of additional aisles

EXCEPTION: In new construction, where the selling space is under 5000 square feet, only one check-out aisle is required to be accessible.

EXCEPTION: In alterations, at least one check-out aisle shall be accessible in facilities under 5000 square feet of selling space. In facilities of 5000 or more square feet of selling space, at least one of each design of check-out aisle shall be made accessible when altered until the number of accessible check-out aisles of each design equals the number required in new construction.

Examples of check-out aisles of different "design" include those which are specifically designed to serve different functions. Different "design" includes but is not limited to the following features - length of belt or no belt; or permanent signage designating the aisle as an express lane.

(2) Clear aisle width for accessible check-out aisles shall comply with 4.2.1 and maximum adjoining counter height shall not exceed 38 in (965 mm) above the finish floor. The top of the lip shall not exceed 40 in (1015 mm) above the finish floor.

(3) Signage identifying accessible check-out aisles shall comply with 4.30.7 and shall be mounted above the check-out aisle in the same location where the check-out number or type of check-out is displayed.

7.4 Security Bollards. Any device used to prevent the removal of shopping carts from store premises shall not prevent access or egress to people in wheelchairs. An alternate entry that is equally convenient to that provided for the ambulatory population is acceptable.

8. LIBRARIES.

8.1 General. In addition to the requirements of 4.1 to 4.35, the design of all public areas of a library shall comply with 8, including reading and study areas, stacks, reference rooms, reserve areas, and special facilities or collections.

8.2 Reading and Study Areas. At least 5 percent or a minimum of one of each element of fixed seating, tables, or study carrels shall comply with 4.2 and 4.32. Clearances between fixed accessible tables and between study carrels shall comply with 4.3.

8.3 Check-Out Areas. At least one lane at each check-out area shall comply with 7.2(1). Any traffic control or book security gates or turnstiles shall comply with 4.13.

8.4 Card Catalogs and Magazine Displays. Minimum clear aisle space at card catalogs and magazine displays shall comply with Fig. 55. Maximum reach height shall comply with 4.2, with a height of 48 in (1220 mm) preferred irrespective of approach allowed.

8.5 Stacks. Minimum clear aisle width between stacks shall comply with 4.3, with a minimum clear aisle width of 42 in (1065 mm) preferred where possible. Shelf height in stack areas is unrestricted (see Fig. 56).

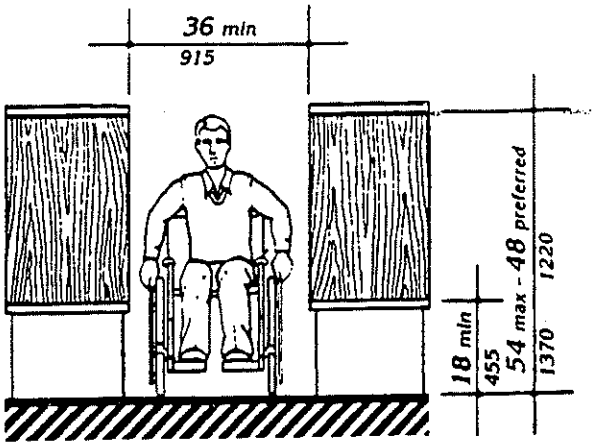


Fig. 55
Card Catalog

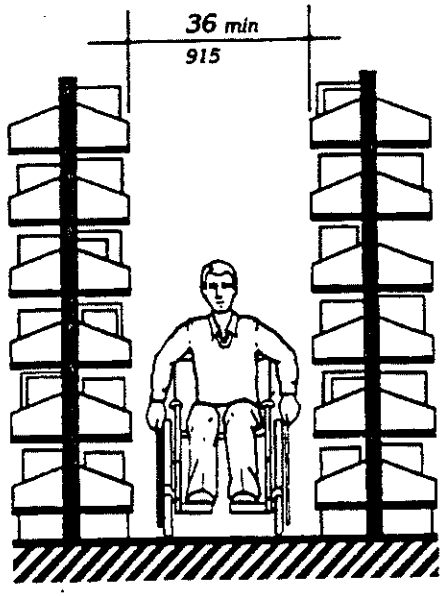


Fig. 56
Stacks

9. ACCESSIBLE TRANSIENT LODGING.

(1) Except as specified in the special technical provisions of this section, accessible transient lodging shall comply with the applicable requirements of 4.1 through 4.35. Transient lodging includes facilities or portions thereof used for sleeping accommodations, when not classed as a medical care facility.

9.1 Hotels, Motels, Inns, Boarding Houses, Dormitories, Resorts and Other Similar Places of Transient Lodging.

9.1.1 General. All public use and common use areas are required to be designed and constructed to comply with section 4 (Accessible Elements and Spaces: Scope and Technical Requirements).

EXCEPTION: Sections 9.1 through 9.4 do not apply to an establishment located within a building that contains not more than five rooms for rent or hire and that is actually occupied by the proprietor of such establishment as the residence of such proprietor.

9.1.2 Accessible Units, Sleeping Rooms, and Suites. Accessible sleeping rooms or suites that comply with the requirements of 9.2 (Requirements for Accessible Units, Sleeping Rooms, and Suites) shall be provided in conformance with the table below. In addition, in hotels, of 50 or more sleeping rooms or suites, additional accessible sleeping rooms or suites that include a roll-in shower shall also be provided in conformance with the table below. Such accommodations shall comply with the requirements of 9.2, 4.21, and Figure 57(a) or (b).

69.42

9.1.3 Sleeping Accommodations for Persons with Hearing Impairments

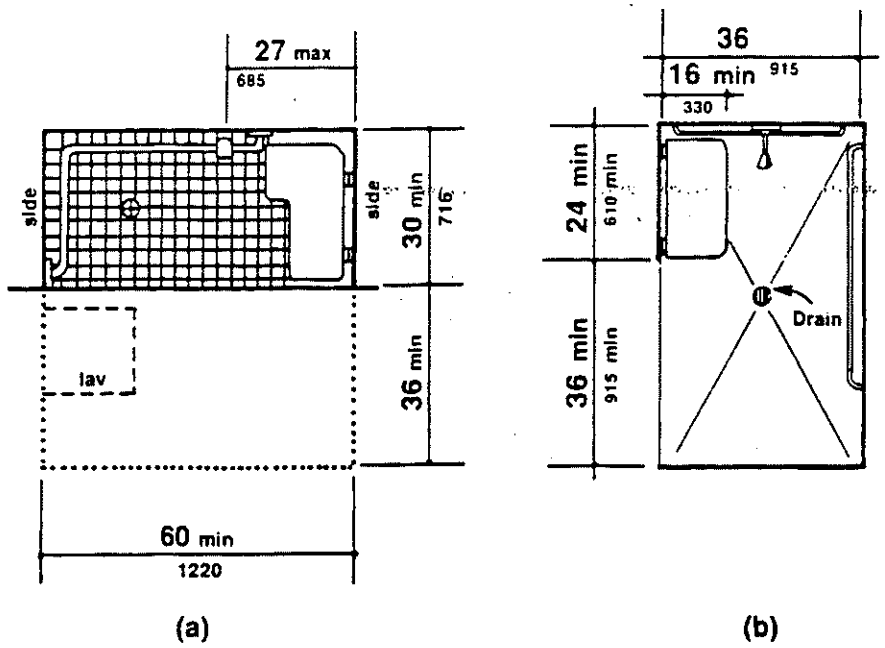


Fig. 57
Roll-in Shower with Folding Seat

Number of Rooms	Accessible Rooms	Rooms with Roll-in Showers
1 to 25	1	
26 to 50	2	
51 to 75	3	1
76 to 100	4	1
101 to 150	5	2
151 to 200	6	2
201 to 300	7	3
301 to 400	8	4
401 to 500	9	4 plus one for each additional 100 over 400
501 to 1000	2% of total	
1001 and over	20 plus 1 for each 100 over 1000	

9.1.3 Sleeping Accommodations for Persons with Hearing Impairments. In addition to those accessible sleeping rooms and suites required by 9.1.2, sleeping rooms and suites that comply with 9.3 (Visual Alarms, Notification Devices, and Telephones) shall be provided in conformance with the following table:

Number of Elements	Accessible Elements
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2% of total
1001 and over	20 plus 1 for each 100 over 1000

9.1.4 Classes of Sleeping Accommodations.

(1) In order to provide persons with disabilities a range of options equivalent to those available to other persons served by the facility, sleeping rooms and suites required to be accessible by 9.1.2 shall be dispersed among the various classes of sleeping accommodations available to patrons of the place of transient lodging. Factors to be considered include room size, cost, amenities provided, and the number of beds provided.

(2) Equivalent Facilitation. For purposes of this section, it shall be deemed equivalent facilitation if the operator of a facility elects to limit construction of accessible rooms to those intended for multiple occupancy, provided that such rooms are made available at the cost of a single-occupancy room to an individual with disabilities who requests a single-occupancy room.

9.1.5. Alterations to Accessible Units, Sleeping Rooms, and Suites. When sleeping rooms are being altered in an existing facility, or portion thereof, subject to the requirements of this section, at least one sleeping room or suite that complies with the requirements of 9.2 (Requirements for Accessible Units, Sleeping Rooms, and Suites) shall be provided for each 25 sleeping rooms, or fraction thereof, of rooms being altered until the number of such rooms provided equals the number required to be accessible with 9.1.2. In addition, at least one sleeping room or suite that complies with the requirements of 9.3 (Visual Alarms, Notification Devices, and Telephones) shall be provided for each 25 sleeping rooms, or fraction thereof, of rooms being altered until the number of such rooms equals the number required to be accessible by 9.1.3.

9.2 Requirements for Accessible Units, Sleeping Rooms and Suites.

9.2.1 General. Units, sleeping rooms, and suites required to be accessible by 9.1 shall comply with 9.2.

9.2.2 Minimum Requirements. An accessible unit, sleeping room or suite shall be on an accessible route complying with 4.3 and have the following accessible elements and spaces.

(1) Accessible sleeping rooms shall have a 36 in (915 mm) clear width maneuvering space located along both sides of a bed, except that where two beds are provided, this requirement can be met by providing a 36 in (915 mm) wide maneuvering space located between the two beds.

(2) An accessible route complying with 4.3 shall connect all accessible spaces and elements, including telephones, within the unit, sleeping room, or suite. This is not intended to require an elevator in multi-story units as long as the spaces identified in 9.2.2(6) and (7) are on accessible levels and the accessible sleeping area is suitable for dual occupancy.

(3) Doors and doorways designed to allow passage into and within all sleeping rooms, suites or other covered units shall comply with 4.13.

(4) If fixed or built-in storage facilities such as cabinets, shelves, closets, and drawers are provided in accessible spaces, at least one of each type provided shall contain storage space complying with 4.25. Additional storage may be provided outside of the dimensions required by 4.25.

(5) All controls in accessible units, sleeping rooms, and suites shall comply with 4.27.

(6) Where provided as part of an accessible unit, sleeping room, or suite, the following spaces shall be accessible and shall be on an accessible route:

(a) the living area.

(b) the dining area.

(c) at least one sleeping area.

(d) patios, terraces, or balconies.

EXCEPTION: The requirements of 4.13.8 and 4.3.8 do not apply where it is necessary to utilize a higher door threshold or a change in level to protect the integrity of the unit from wind/water damage. Where this exception results in patios, terraces or balconies that are not at an accessible level, equivalent facilitation

shall be provided. (E.g., equivalent facilitation at a hotel patio or balcony might consist of providing raised decking or a ramp to provide accessibility.)

(e) at least one full bathroom (i.e., one with a water closet, a lavatory, and a bathtub or shower).

(f) if only half baths are provided, at least one half bath.

(g) carports, garages or parking spaces.

(7) Kitchens, Kitchenettes, or Wet Bars. When provided as accessory to a sleeping room or suite, kitchens, kitchenettes, wet bars, or similar amenities shall be accessible. Clear floor space for a front or parallel approach to cabinets, counters, sinks, and appliances shall be provided to comply with 4.2.4. Countertops and sinks shall be mounted at a maximum height of 34 in (865 mm) above the floor. At least fifty percent of shelf space in cabinets or refrigerator/freezers shall be within the reach ranges of 4.2.5 or 4.2.6 and space shall be designed to allow for the operation of cabinet and/or appliance doors so that all cabinets and appliances are accessible and usable. Controls and operating mechanisms shall comply with 4.27.

(8) Sleeping room accommodations for persons with hearing impairments required by 9.1 and complying with 9.3 shall be provided in the accessible sleeping room or suite.

9.3 Visual Alarms, Notification Devices and Telephones.

9.3.1 General. In sleeping rooms required to comply with this section, auxiliary visual alarms shall be provided and shall comply with 4.28.4. Visual notification devices shall also be provided in units, sleeping rooms and suites to alert room occupants of incoming telephone calls and a door knock or bell. Notification devices shall not be connected to auxiliary visual alarm signal appliances. Permanently installed telephones shall have volume controls complying with 4.31.5; an accessible electrical outlet within 4 ft (1220 mm) of a telephone connection shall be provided to facilitate the use of a text telephone.

9.3.2 Equivalent Facilitation. For purposes of this section, equivalent facilitation shall include the installation of electrical outlets (including outlets connected to a facility's central alarm system) and telephone wiring in sleeping rooms and suites to enable persons with hearing impairments to utilize portable visual alarms and communication devices provided by the operator of the facility.

9.4 Other Sleeping Rooms and Suites.

Doors and doorways designed to allow passage into and within all sleeping units or other covered units shall comply with 4.13.5.

9.5 Transient Lodging in Homeless Shelters, Halfway Houses, Transient Group Homes, and Other Social Service Establishments.

9.5.1 New Construction. In new construction all public use and common use areas are required to be designed and constructed to comply with section 4. At least one of each type of amenity (such as washers, dryers and similar equipment installed for the use of occupants) in each common area shall be accessible and shall be located on an accessible route to any accessible unit or sleeping accommodation.

EXCEPTION: Where elevators are not provided as allowed in 4.1.3(5), accessible amenities are not required on inaccessible floors as long as one of each type is provided in common areas on accessible floors.

9.5.2 Alterations.

(1) Social service establishments which are not homeless shelters:

(a) The provisions of 9.5.3 and 9.1.5 shall apply to sleeping rooms and beds.

(b) Alteration of other areas shall be consistent with the new construction provisions of 9.5.1.

(2) Homeless shelters. If the following elements are altered, the following requirements apply:

(a) at least one public entrance shall allow a person with mobility impairments to approach, enter and exit including a minimum clear door width of 32 in (815 mm).

(b) sleeping space for homeless persons as provided in the scoping provisions of 9.1.2 shall include doors to the sleeping area with a minimum clear width of 32 in (815 mm) and maneuvering space around the beds for persons with mobility impairments complying with 9.2.2(1).

(c) at least one toilet room for each gender or one unisex toilet room shall have a minimum clear door width of 32 in (815 mm), minimum turning space complying with 4.2.3, one water closet complying with 4.16, one lavatory complying with 4.19 and the door shall have a privacy latch; and, if provided, at least one tub or shower shall comply with 4.20 or 4.21, respectively.

(d) at least one common area which a person with mobility impairments can approach, enter and exit including a minimum clear door width of 32 in (815 mm).

(e) at least one route connecting elements (a), (b), (c) and (d) which a person with mobility impairments can use including minimum clear width of 36 in (915 mm), passing space complying with 4.3.4, turning space complying with 4.2.3 and changes in levels complying with 4.3.8.

(f) homeless shelters can comply with the provisions of (a)-(e) by providing the above elements on one accessible floor.

9.5.3. Accessible Sleeping Accommodations in New Construction. Accessible sleeping rooms shall be provided in conformance with the table in 9.1.2 and shall comply with 9.2 Accessible Units, Sleeping Rooms and Suites (where the items are provided). Additional sleeping rooms that comply with 9.3 Sleeping Accommodations for Persons with Hearing Impairments shall be provided in conformance with the table provided in 9.1.3.

In facilities with multi-bed rooms or spaces, a percentage of the beds equal to the table provided in 9.1.2 shall comply with 9.2.2(1).

10. TRANSPORTATION FACILITIES.

10.1 General. Every station, bus stop, bus stop pad, terminal, building or other transportation facility, shall comply with the applicable provisions of 4.1 through 4.35, sections 5 through 9, and the applicable provisions of this section. The exceptions for elevators in 4.1.3(5), exception 1 and 4.1.6(1)(k) do not apply to a terminal, depot, or other station used for specified public transportation, or an airport passenger terminal, or facilities subject to Title II.

10.2 Bus Stops and Terminals.

10.2.1 New Construction.

(1) Where new bus stop pads are constructed at bus stops, bays or other areas where a lift or ramp is to be deployed, they shall have a firm, stable surface; a minimum clear length of 96 inches (measured from the curb or vehicle roadway edge) and a minimum clear width of 60 inches (measured parallel to the vehicle roadway) to the maximum extent allowed by legal or site constraints; and shall be connected to streets, sidewalks or pedestrian paths by an accessible route complying with 4.3 and 4.4. The slope of the pad parallel to the roadway shall, to the extent practicable, be the same as the roadway. For water drainage, a maximum slope of 1:50 (2%) perpendicular to the roadway is allowed.

(2) Where provided, new or replaced bus shelters shall be installed or positioned so as to permit a wheelchair or mobility aid user to enter from the public way and to reach a location, having a minimum clear floor area of 30 inches by 48 inches, entirely within the perimeter of the shelter. Such shelters shall be connected by an accessible route to the boarding area provided under paragraph (1) of this section.

(3) Where provided, all new bus route identification signs shall comply with 4.30.5. In addition, to the maximum extent practicable, all new bus route identification signs shall comply with 4.30.2 and 4.30.3. Signs

that are sized to the maximum dimensions permitted under legitimate local, state or federal regulations or ordinances shall be considered in compliance with 4.30.2 and 4.30.3 for purposes of this section.

EXCEPTION: Bus schedules, timetables, or maps that are posted at the bus stop or bus bay are not required to comply with this provision.

10.2.2 Bus Stop Siting and Alterations.

(1) Bus stop sites shall be chosen such that, to the maximum extent practicable, the areas where lifts or ramps are to be deployed comply with section 10.2.1(1) and (2).

(2) When new bus route identification signs are installed or old signs are replaced, they shall comply with the requirements of 10.2.1(3).

10.3 Fixed Facilities and Stations.

10.3.1 New Construction. New stations in rapid rail, light rail, commuter rail, intercity bus, intercity rail, high speed rail, and other fixed guideway systems (e.g., automated guideway transit, monorails, etc.) shall comply with the following provisions, as applicable:

(1) Elements such as ramps, elevators or other circulation devices, fare vending or other ticketing areas, and fare collection areas shall be placed to minimize the distance which wheelchair users and other persons who cannot negotiate steps may have to travel compared to the general public. The circulation path, including an accessible entrance and an accessible route, for persons with disabilities shall, to the maximum extent practicable, coincide with the circulation path for the general public. Where the circulation path is different, signage complying with 4.30.1, 4.30.2, 4.30.3, 4.30.5, and 4.30.7(1) shall be provided to indicate direction to and identify the accessible entrance and accessible route.

(2) In lieu of compliance with 4.1.3(8), at least one entrance to each station shall comply with 4.14, Entrances. If different entrances to a station serve different transportation fixed routes or groups of fixed routes, at least one entrance serving each group or route shall comply with 4.14, Entrances. All accessible entrances shall, to the maximum extent practicable, coincide with those used by the majority of the general public.

(3) Direct connections to commercial, retail, or residential facilities shall have an accessible route complying with 4.3 from the point of connection to boarding platforms and all transportation system elements used by the public. Any elements provided to facilitate future direct connections shall be on an accessible route connecting boarding platforms and all transportation system elements used by the public.

(4) Where signs are provided at entrances to stations identifying the station or the entrance, or both, at least one sign at each entrance shall comply with 4.30.4 and 4.30.6. Such signs shall be placed in uniform locations at entrances within the transit system to the maximum extent practicable.

EXCEPTION: Where the station has no defined entrance, but signage is provided, then the accessible signage shall be placed in a central location.

(5) Stations covered by this section shall have identification signs complying with 4.30.1, 4.30.2, 4.30.3, and 4.30.5. Signs shall be placed at frequent intervals and shall be clearly visible from within the vehicle on both sides when not obstructed by another train. When station identification signs are placed close to vehicle windows (i.e., on the side opposite from boarding) each shall have the top of the highest letter or symbol below the top of the vehicle window and the bottom of the lowest letter or symbol above the horizontal mid-line of the vehicle window.

(6) Lists of stations, routes, or destinations served by the station and located on boarding areas, platforms, or mezzanines shall comply with 4.30.1, 4.30.2, 4.30.3, and 4.30.5. A minimum of one sign identifying the specific station and complying with 4.30.4 and 4.30.6 shall be provided on each platform or boarding area. All signs referenced in this paragraph shall, to the maximum extent practicable, be placed in uniform locations within the transit system.

(7)* Automatic fare vending, collection and adjustment (e.g., add-fare) systems shall comply with 4.34.2, 4.34.3, and 4.34.4. At each accessible entrance such devices shall be located on an accessible route. If self-service fare collection devices are provided for the use of the general public, at least one accessible device for entering, and at least one for exiting, unless one device serves both functions, shall be provided at each accessible point of entry or exit. Accessible fare collection devices shall have a minimum clear opening width of 32 inches; shall permit passage of a wheelchair; and, where provided, coin or card slots and controls necessary for operation shall comply with 4.27. Gates which must be pushed open by wheelchair or mobility aid users shall have a smooth continuous surface extending from 2 inches above the floor to 27 inches above the floor and shall comply with 4.13. Where the circulation path does not coincide with that used by the general public, accessible fare collection systems shall be located at or adjacent to the accessible point of entry or exit.

(8) Platform edges bordering a drop-off and not protected by platform screens or guard rails shall have a detectable warning. Such detectable warnings shall comply with 4.29.2 and shall be 24 inches wide running the full length of the platform drop-off.

(9) In stations covered by this section, rail-to-platform height in new stations shall be coordinated with the floor height of new vehicles so that the vertical difference, measured when the vehicle is at rest, is within plus or minus 5/8 inch under normal passenger load conditions. For rapid rail, light rail, commuter rail, high speed rail, and intercity rail systems in new stations, the horizontal gap, measured when the new vehicle is at rest, shall be no greater than 3 inches. For slow moving automated guideway "people mover" transit systems, the horizontal gap in new stations shall be no greater than 1 inch.

EXCEPTION 1: Existing vehicles operating in new stations may have a vertical difference with respect to the new platform within plus or minus 1-1/2 inches.

EXCEPTION 2: In light rail, commuter rail and intercity rail systems where it is not operationally or structurally feasible to meet the horizontal gap or vertical difference requirements, mini-high platforms, car-borne or platform-mounted lifts, ramps or bridge plates, or similar manually deployed devices, meeting the applicable requirements of 36 CFR part 1192, or 49 CFR part 38 shall suffice.

(10) Stations shall not be designed or constructed so as to require persons with disabilities to board or alight from a vehicle at a location other than one used by the general public.

(11) Illumination levels in the areas where signage is located shall be uniform and shall minimize glare on signs. Lighting along circulation routes shall be of a type and configuration to provide uniform illumination.

(12) Text Telephones: The following shall be provided in accordance with 4.31.9:

(a) If an interior public pay telephone is provided in a transit facility (as defined by the Department of Transportation) at least one interior public text telephone shall be provided in the station.

(b) Where four or more public pay telephones serve a particular entrance to a rail station and at least one is in an interior location, at least one interior public text telephone shall be provided to serve that entrance. Compliance with this section constitutes compliance with section 4.1.3(17)(c).

(13) Where it is necessary to cross tracks to reach boarding platforms, the route surface shall be level and flush with the rail top at the outer edge and between the rails, except for a maximum 2-1/2 inch gap on the inner edge of each rail to permit passage of wheel flanges. Such crossings shall comply with 4.29.5. Where gap reduction is not practicable, an above-grade or below-grade accessible route shall be provided.

(14) Where public address systems are provided to convey information to the public in terminals, stations, or other fixed facilities, a means of conveying the same or equivalent information to persons with hearing loss or who are deaf shall be provided.

10.3.2 Existing Facilities: Key Stations.

(15) Where clocks are provided for use by the general public, the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals, and/or digits shall contrast with the background either light-on-dark or dark-on-light. Where clocks are mounted overhead, numerals and/or digits shall comply with 4.30.3. Clocks shall be placed in uniform locations throughout the facility and system to the maximum extent practicable.

(16) Where provided in below grade stations, escalators shall have a minimum clear width of 32 inches. At the top and bottom of each escalator run, at least two contiguous treads shall be level beyond the comb plate before the risers begin to form. All escalator treads shall be marked by a strip of clearly contrasting color, 2 inches in width, placed parallel to and on the nose of each step. The strip shall be of a material that is at least as slip resistant as the remainder of the tread. The edge of the tread shall be apparent from both ascending and descending directions.

(17) Where provided, elevators shall be glazed or have transparent panels to allow an unobstructed view both in to and out of the car. Elevators shall comply with 4.10.

EXCEPTION: Elevator cars with a clear floor area in which a 60 inch diameter circle can be inscribed may be substituted for the minimum car dimensions of 4.10, Fig. 22.

(18) Where provided, ticketing areas shall permit persons with disabilities to obtain a ticket and check baggage and shall comply with 7.2.

(19) Where provided, baggage check-in and retrieval systems shall be on an accessible route complying with 4.3, and shall have space immediately adjacent complying with 4.2. If unattended security barriers are provided, at least one gate shall comply with 4.13. Gates which must be pushed open by wheelchair or mobility aid users shall have a smooth continuous surface extending from 2 inches above the floor to 27 inches above the floor.

10.3.2 Existing Facilities: Key Stations.

(1) Rapid, light and commuter rail key stations, as defined under criteria established by the Department of Transportation in subpart C of 49 CFR part 37 and existing intercity rail stations shall provide at least one accessible route from an accessible entrance to those areas necessary for use of the transportation system.

(2) The accessible route required by 10.3.2(1) shall include the features specified in 10.3.1 (1), (4)-(9), (11)-(15), and (17)-(19).

(3) Where technical infeasibility in existing stations requires the accessible route to lead from the public way to a paid area of the transit system, an accessible fare collection system, complying with 10.3.1(7), shall be provided along such accessible route.

(4) In light rail, rapid rail and commuter rail key stations, the platform or a portion thereof and the vehicle floor shall be coordinated so that the vertical difference, measured when the vehicle is at rest, is within plus or minus 1-1/2 inches under all normal passenger load conditions, and the horizontal gap, measured when the vehicle is at rest, is no greater than 3 inches for at least one door of each vehicle or car required to be accessible by 49 CFR part 37.

EXCEPTION 1: Existing vehicles retrofitted to meet the requirements of 49 CFR 37.93 (one-car-per-train rule) shall be coordinated with the platform such that, for at least one door, the vertical difference between the vehicle floor and the platform, measured when the vehicle is at rest with 50% normal passenger capacity, is within plus or minus 2 inches and the horizontal gap is no greater than 4 inches.

EXCEPTION 2: Where it is not structurally or operationally feasible to meet the horizontal gap or vertical difference requirements, mini-high platforms, car-borne or platform mounted lifts, ramps or bridge plates, or similar manually deployed devices, meeting the applicable requirements of 36 CFR part 1192, or 49 CFR part 38, shall suffice.

(5) New direct connections to commercial, retail, or residential facilities shall, to the maximum extent feasible, have an accessible route complying with 4.3 from the point of connection to boarding platforms and all transportation system elements used by the public. Any elements provided to facilitate future direct connections shall be on an accessible route connecting boarding platforms and all transportation system elements used by the public.

10.3.3 Existing Facilities: Alterations.

(1) For the purpose of complying with 4.1.6(2) Alterations to an Area Containing a Primary Function, an area of primary function shall be as defined by applicable provisions of 49 CFR 37.43(c) (Department of Transportation's ADA Rule) or 28 CFR 36.403 (Department of Justice's ADA Rule).

10.4. Airports.

10.4.1 New Construction.

(1) Elements such as ramps, elevators or other vertical circulation devices, ticketing areas, security checkpoints, or passenger waiting areas shall be placed to minimize the distance which wheelchair users and other persons who cannot negotiate steps may have to travel compared to the general public.

(2) The circulation path, including an accessible entrance and an accessible route, for persons with disabilities shall, to the maximum extent practicable, coincide with the circulation path for the general public. Where the circulation path is different, directional signage complying with 4.30.1, 4.30.2, 4.30.3 and 4.30.5 shall be provided which indicates the location of the nearest accessible entrance and its accessible route.

(3) Ticketing areas shall permit persons with disabilities to obtain a ticket and check baggage and shall comply with 7.2.

(4) Where public pay telephones are provided, and at least one is at an interior location, a public text telephone shall be provided in compliance with 4.31.9. Additionally, if four or more public pay telephones are located in any of the following locations, at least one public text telephone shall also be provided in that location:

(a) a main terminal outside the security areas;
(b) a concourse within the security areas; or
(c) a baggage claim area in a terminal.

Compliance with this section constitutes compliance with section 4.1.3(17)(c).

(5) Baggage check-in and retrieval systems shall be on an accessible route complying with 4.3, and shall have space immediately adjacent complying with 4.2.4. If unattended security barriers are provided, at least one gate shall comply with 4.13. Gates which must be pushed open by wheelchair or mobility aid users shall have a smooth continuous surface extending from 2 inches above the floor to 27 inches above the floor.

(6) Terminal information systems which broadcast information to the general public through a public address system shall provide a means to provide the same or equivalent information to persons with a hearing loss or who are deaf. Such methods may include, but are not limited to, visual paging systems using video monitors and computer technology. For persons with certain types of hearing loss such methods may include, but are not limited to, an assistive listening system complying with 4.33.7.

(7) Where clocks are provided for use by the general public the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals, and/or digits shall contrast with their background either light-on-dark or dark-on-light. Where clocks are mounted overhead, numerals and/or digits shall comply with 4.30.3. Clocks shall be placed in uniform locations throughout the facility to the maximum extent practicable.

(8) Security Systems. [Reserved]

10.5 Boat and Ferry Docks.

[Reserved]

APPENDIX

This appendix contains *materials of an advisory nature* and provides additional information that should help the reader to understand the minimum requirements of the *guidelines* or to design buildings or facilities for greater accessibility. The paragraph numbers correspond to the sections or paragraphs of the *guideline* to which the material relates and are therefore not consecutive (for example, A4.2.1 contains additional information relevant to 4.2.1). Sections *of the guidelines* for which additional material appears in this appendix have been indicated by an asterisk. *Nothing in this appendix shall in any way obviate any obligation to comply with the requirements of the guidelines itself.*

A2.2 Equivalent Facilitation. *Specific examples of equivalent facilitation are found in the following sections:*

4.1.6(3)(c)	*Elevators in Alterations*
4.31.9	*Text Telephones*
7.2	*Sales and Service Counters, Teller Windows, Information Counters*
9.1.4	*Classes of Sleeping Accommodations*
9.2.2(6)(d)	*Requirements for Accessible Units, Sleeping Rooms, and Suites*

A4.1.1 Application.

A4.1.1(3) Areas Used Only by Employees as Work Areas. *Where there are a series of individual work stations of the same type (e.g., laboratories, service counters, ticket booths), 5%, but not less than one, of each type of work station should be constructed so that an individual with disabilities can maneuver within the work stations. Rooms housing individual offices in a typical office building must meet the requirements of the guidelines concerning doors, accessible routes, etc. but do not need to allow for maneuvering space around individual desks. Modifications required to permit maneuvering within the work area may be accomplished as a reasonable accommodation to individual employees with disabilities under Title I of the ADA. Consideration should also be given to placing shelves in employee work areas at a convenient height for accessibility or installing commercially available shelving that is adjustable so that reasonable accommodations can be made in the future.*

If work stations are made accessible they should comply with the applicable provisions of 4.2 through 4.35.

A4.1.2 Accessible Sites and Exterior Facilities: New Construction.

A4.1.2(5)(e) Valet Parking. *Valet parking is not always usable by individuals with disabilities. For instance, an individual may use a type of vehicle controls that render the regular controls inoperable or the driver's seat in a van may be removed. In these situations, another person cannot park the vehicle. It is recommended that some self-parking spaces be provided at valet parking facilities for individuals whose vehicles cannot be parked by another person and that such spaces be located on an accessible route to the entrance of the facility.*

A4.1.3 Accessible Buildings: New Construction.

A4.1.3(5) *Only full passenger elevators are covered by the accessibility provisions of 4.10. Materials and equipment hoists, freight elevators not intended for passenger use, dumbwaiters, and construction elevators are not covered by these guidelines. If a building is exempt from the elevator requirement, it is not necessary to provide a platform lift or other means of vertical access in lieu of an elevator.*

Under Exception 4, platform lifts are allowed where existing conditions make it impractical to install a ramp or elevator. Such conditions generally occur where it is essential to provide access to small raised or lowered areas where space may not be available for a ramp. Examples include, but are not limited to, raised pharmacy platforms, commercial offices raised above a sales floor, or radio and news booths.

A4.1.3(9) *Supervised automatic sprinkler systems have built in signals for monitoring features of the system such as the opening and closing of water control valves, the power supplies for needed pumps, water tank levels, and for indicating conditions that will impair the satisfactory operation of the sprinkler system.*

Because of these monitoring features, supervised automatic sprinkler systems have a high level of satisfactory performance and response to fire conditions.

A4.1.3(10) *If an odd number of drinking fountains is provided on a floor, the requirement in 4.1.3(10)(b) may be met by rounding down the odd number to an even number and calculating 50% of the even number. When more than one drinking fountain on a floor is required to comply with 4.15, those fountains should be dispersed to allow wheelchair users convenient access. For example, in a large facility such as a convention center that has water fountains at several locations on a floor, the accessible water fountains should be located so that wheelchair users do not have to travel a greater distance than other people to use a drinking fountain.*

A4.1.3(17)(b) *In addition to the requirements of section 4.1.3(17)(b), the installation of additional volume controls is encouraged. Volume controls may be installed on any telephone.*

A4.1.3(19)(a) *Readily removable or folding seating units may be installed in lieu of providing an open space for wheelchair users. Folding seating units are usually two fixed seats that can be easily folded into a fixed center bar to allow for one or two open spaces for wheelchair users when necessary. These units are more easily adapted than removable seats which generally require the seat to be removed in advance by the facility management.*

Either a sign or a marker placed on seating with removable or folding arm rests is required by this section. Consideration should be given for ensuring identification of such seats in a darkened theater. For example, a marker which contrasts (light on dark or dark on light) and which also reflects light could be placed on the side of such seating so as to be visible in a lighted auditorium and also to reflect light from a flashlight.

A4.1.6 Accessible Buildings: Alterations.

A4.1.6(1)(h) *When an entrance is being altered, it is preferable that those entrances being altered be made accessible to the extent feasible.*

A4.2 Space Allowances and Reach Ranges.

A4.2.1 Wheelchair Passage Width.

(1) Space Requirements for Wheelchairs. Many persons who use wheelchairs need a 30 in (760 mm) clear opening width for doorways, gates, and the like, when the latter are entered head-on. If the *person* is unfamiliar with a building, if competing traffic is heavy, if sudden or frequent movements are needed, or if the wheelchair must be turned at an opening, then greater clear widths are needed. For most situations, the addition of an inch of leeway on either side is sufficient. Thus, a minimum clear width of 32 in (815 mm) will provide adequate clearance. However, when an opening or a restriction in a passageway is more than 24 in (610 mm) long, it is essentially a passageway and must be at least 36 in (915 mm) wide.

(2) Space Requirements for Use of Walking Aids. Although people who use walking aids can maneuver through clear width openings of 32 in (815 mm), they need 36 in (915 mm) wide passageways and walks for comfortable gaits. Crutch tips, often extending down at a wide angle, are a hazard in narrow passageways where they might not be seen by other pedestrians. Thus, the 36 in (915 mm) width provides a safety allowance both for the person *with a disability* and for others.

(3) Space Requirements for Passing. Able-bodied *persons* in winter clothing, walking

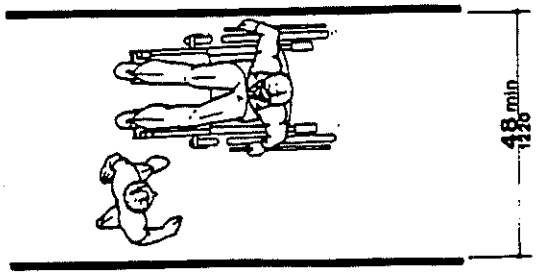


Fig. A1
Minimum Passage Width for One Wheelchair and One Ambulatory Person

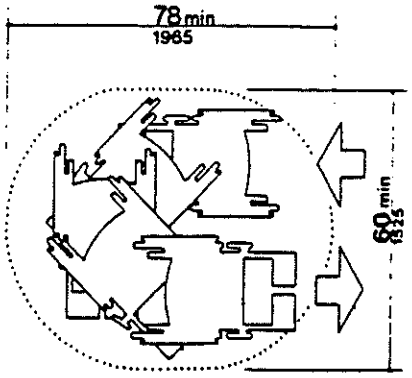
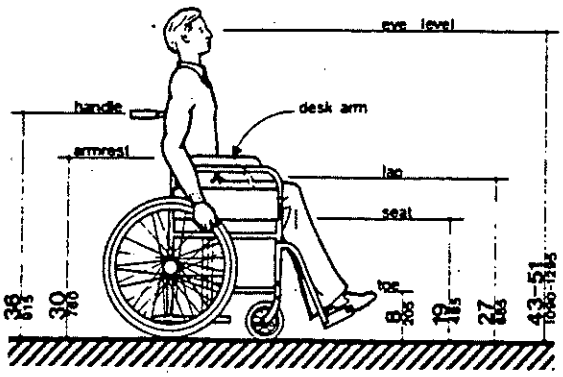
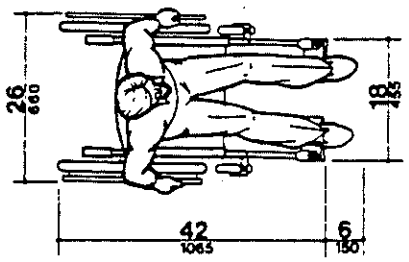


Fig. A2
Space Needed for Smooth U-Turn in a Wheelchair

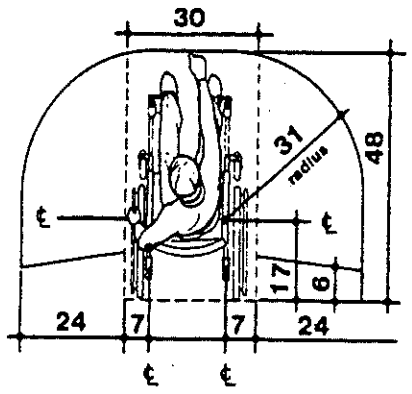




NOTE: Footrests may extend further for tall people

Fig. A3
Dimensions of Adult-Sized Wheelchairs

straight ahead with arms swinging, need 32 in (815 mm) of width, which includes 2 in (50 mm) on either side for sway, and another 1 in (25 mm) tolerance on either side for clearing nearby objects or other pedestrians. Almost all wheelchair users and those who use walking aids can also manage within this 32 in (815 mm) width for short distances. Thus, two streams of traffic can pass in 64 in (1625 mm) in a comfortable flow. Sixty inches (1525 mm) provides a minimum width for a somewhat more restricted flow. If the clear width is less than 60 in (1525 mm), two wheelchair users will not be able to pass but will have to seek a wider place for passing. Forty-eight inches (1220 mm) is the minimum width needed for an ambulatory person to pass a nonambulatory or semi-ambulatory person. Within this 48 in (1220 mm) width, the ambulatory person will have to twist to pass a wheelchair user, a person with a *service animal*, or a



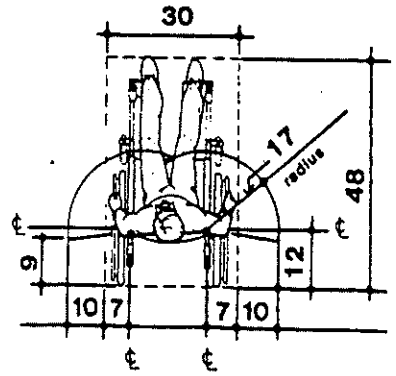


Fig. A3 (a)

A4.3 Accessible Route

semi-ambulatory person. There will be little leeway for swaying or missteps (see Fig. A1).

A4.2.3 Wheelchair Turning Space. *These guidelines specify* a minimum space of 60 in (1525 mm) diameter *or a 60 in by 60 in (1525 mm by 1525 mm) T-shaped space* for a pivoting 180-degree turn of a wheelchair. This space is usually satisfactory for turning around, but many people will not be able to turn without repeated tries and bumping into surrounding objects. The space shown in Fig. A2 will allow most wheelchair users to complete U-turns without difficulty.

A4.2.4 Clear Floor or Ground Space for Wheelchairs. The wheelchair and user shown in Fig. A3 represent typical dimensions for a large adult male. The space requirements in this *guideline* are based upon maneuvering clearances that will accommodate most wheelchairs. Fig. A3 provides a uniform reference for design not covered by this *guideline*.

A4.2.5 & A4.2.6 Reach. *Reach ranges for persons seated in wheelchairs may be further clarified by Fig. A3(a). These drawings approximate in the plan view the information shown in Fig. 4, 5, and 6.*

A4.3 Accessible Route.

A4.3.1 General.

(1) Travel Distances. Many people with mobility impairments can move at only very slow speeds; for many, traveling 200 ft (61 m) could take about 2 minutes. This assumes a rate of about 1.5 ft/s (455 mm/s) on level ground. It also assumes that the traveler would move continuously. However, on trips over 100 ft (30 m), disabled people are apt to rest frequently, which substantially increases their trip times. Resting periods of 2 minutes for every 100 ft (30 m) can be used to estimate travel times for people with severely limited stamina. In inclement weather, slow progress and resting can greatly increase a disabled person's exposure to the elements.

(2) Sites. Level, indirect routes or those with running slopes lower than 1:20 can sometimes provide more convenience than direct routes with maximum allowable slopes or with ramps.

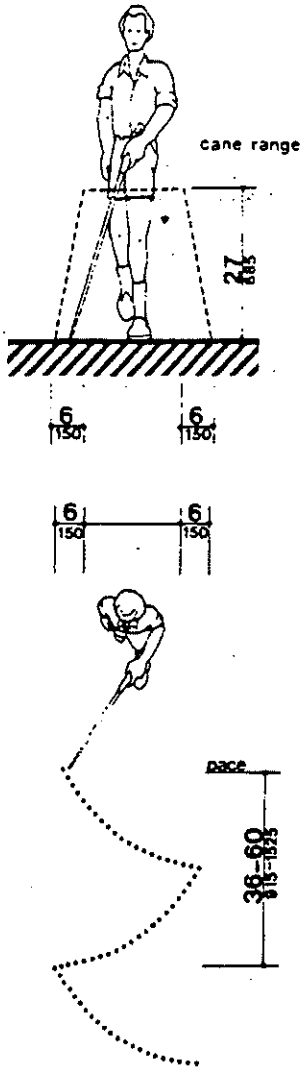


Fig. A4
Cane Technique

A4.3.10 Egress. Because people with disabilities may visit, be employed or be a resident in any building, emergency management plans with specific provisions to ensure their safe evacuation also play an essential role in fire safety and life safety.

A4.3.11.3 Stairway Width. *A 48 inch (1220 mm) wide exit stairway is needed to allow assisted evacuation (e.g., carrying a person in a wheelchair) without encroaching on the exit path for ambulatory persons.*

A4.3.11.4 Two-way Communication. *It is essential that emergency communication not be dependent on voice communications alone because the safety of people with hearing or speech impairments could be jeopardized. The visible signal requirement could be satisfied with something as simple as a button in the area of rescue assistance that lights, indicating that help is on the way, when the message is answered at the point of entry.*

A4.4 Protruding Objects.

A4.4.1 General. *Service animals* are trained to recognize and avoid hazards. However, most people with severe impairments of vision use the long cane as an aid to mobility. The two principal cane techniques are the touch technique, where the cane arcs from side to side and touches points outside both shoulders; and the diagonal technique, where the cane is held in a stationary position diagonally across the body with the cane tip touching or just above the ground at a point outside one shoulder and the handle or grip extending to a point outside the other shoulder. The touch technique is used primarily in uncontrolled areas, while the diagonal technique is used primarily in certain limited, controlled, and familiar environments. Cane users are often trained to use both techniques.

Potential hazardous objects are noticed only if they fall within the detection range of canes (see Fig. A4). Visually impaired people walking toward an object can detect an overhang if its lowest surface is not higher than 27 in (685 mm). When walking alongside *protruding* objects, they cannot detect overhangs. Since proper cane and *service animal* techniques keep people away from the edge of a path or from walls, a slight overhang of no more than 4 in (100 mm) is not hazardous.

A4.5 Ground and Floor Surfaces.

A4.5.1 General. *People who have difficulty walking or* maintaining balance *or who use crutches, canes, or walkers,* and those with restricted gaits are particularly sensitive to slipping and tripping hazards. For such people, a stable and regular surface is necessary for safe walking, particularly on stairs. Wheelchairs can be propelled most easily on surfaces that are hard, stable, and regular. Soft loose surfaces such as shag carpet, loose sand or gravel, wet clay, and irregular surfaces such as cobblestones can significantly impede wheelchair movement.

Slip resistance is based on the frictional force necessary to keep a shoe heel or crutch tip from slipping on a walking surface under conditions likely to be found on the surface. *While the dynamic coefficient of friction during walking varies in a complex and non-uniform way, the static coefficient of friction, which can be measured in several ways, provides a close approximation of the slip resistance of a surface. Contrary to popular belief, some slippage is necessary to walking, especially for persons with restricted gaits; a truly "non-slip" surface could not be negotiated.*

The Occupational Safety and Health Administration recommends that walking surfaces have a static coefficient of friction of 0.5. A research project sponsored by the Architectural and Transportation Barriers Compliance Board (Access Board) conducted tests with persons with disabilities and concluded that a higher coefficient of friction was needed by such persons. A static coefficient of friction of 0.6 is recommended for accessible routes and 0.8 for ramps.

It is recognized that the coefficient of friction varies considerably due to the presence of contaminants, water, floor finishes, and other factors not under the control of the designer or builder and not subject to design and construction guidelines and that compliance would be difficult to measure on the building site. Nevertheless, many common building materials suitable for flooring are now labeled with information on the static coefficient of friction. While it may not be possible to compare one product directly with another, or to guarantee a constant measure, builders and designers are encouraged to specify materials with appropriate values. As more products include information on slip resistance, improved uniformity in measurement and specification is likely. The Access Board's advisory guidelines on Slip Resistant Surfaces provides additional information on this subject.

Cross slopes on walks and ground or floor surfaces can cause considerable difficulty in propelling a wheelchair in a straight line.

A4.6 Parking and Passenger Loading Zones

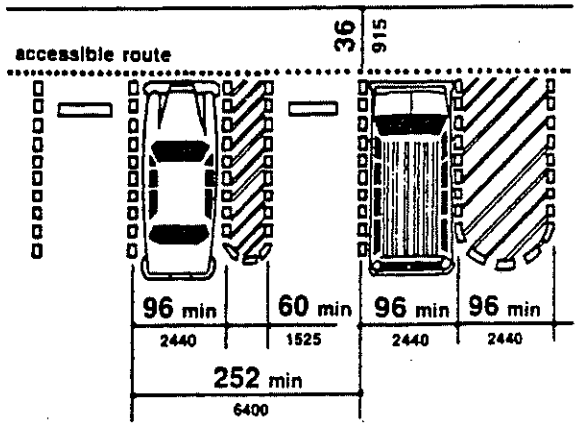
A4.5.3 Carpet. Much more needs to be done in developing both quantitative and qualitative criteria for carpeting *(i.e., problems associated with texture and weave need to be studied).* However, certain functional characteristics are well established. When both carpet and padding are used, it is desirable to have minimum movement (preferably none) between the floor and the pad and the pad and the carpet which would allow the carpet to hump or warp. In heavily trafficked areas, a thick, soft (plush) pad or cushion, particularly in combination with long carpet pile, makes it difficult for individuals in wheelchairs and those with other ambulatory disabilities to get about. Firm carpeting can be achieved through proper selection and combination of pad and carpet, sometimes with the elimination of the pad or cushion, and with proper installation. *Carpeting designed with a weave that causes a zig-zag effect when wheeled across is strongly discouraged.*

A4.6 Parking and Passenger Loading Zones.

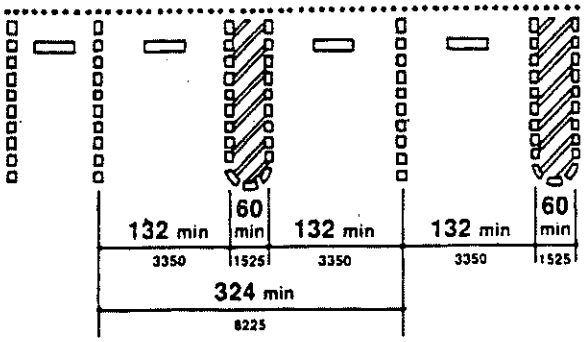
A4.6.3 Parking Spaces. *The increasing use of vans with side-mounted lifts or ramps by persons with disabilities has necessitated some revisions in specifications for parking spaces and adjacent access aisles. The typical accessible parking space is 96 in (2440 mm) wide with an adjacent 60 in (1525 mm) access aisle. However, this aisle does not permit lifts or ramps to be deployed and still leave room for a person using a wheelchair or other mobility aid to exit the lift platform or ramp. In tests conducted with actual lift/van/wheelchair combinations, (under a Board-sponsored Accessible Parking and Loading Zones Project) researchers found that a space and aisle totaling almost 204 in (5180 mm) wide was needed to deploy a lift and exit conveniently. The "van accessible" parking space required by these guidelines provides a 96 in (2440 mm) wide space with a 96 in (2440 mm) adjacent access aisle which is just wide enough to maneuver and exit from a side mounted lift. If a 96 in (2440 mm) access aisle is placed between two spaces, two "van accessible" spaces are created. Alternatively, if the wide access aisle is provided at the end of a row (an area often unused), it may be possible to provide the wide access aisle without additional space (see Fig. A5(a)).*

A sign is needed to alert van users to the presence of the wider aisle, but the space is not intended to be restricted only to vans.

"Universal" Parking Space Design. An alternative to the provision of a percentage of spaces with a wide aisle, and the associated need to include additional signage, is the use of what has been called the "universal" parking space design. Under this design, all accessible spaces are 132 in (3350 mm) wide with a 60 in (1525 mm) access aisle (see Fig. A5(b)). One



(a)
Van Accessible Space at End Row



(b)
Universal Parking Space Design

Fig. A5
Parking Space Alternatives

advantage to this design is that no additional signage is needed because all spaces can accommodate a van with a side-mounted lift or ramp. Also, there is no competition between cars and vans for spaces since all spaces can accommodate either. Furthermore, the wider space permits vehicles to park to one side or the other within the 132 in (3350 mm) space to allow persons to exit and enter the vehicle on either the driver or passenger side, although, in some cases, this would require exiting or entering without a marked access aisle.

An essential consideration for any design is having the access aisle level with the parking space. Since a person with a disability, using a lift or ramp, must maneuver within the access aisle, the aisle cannot include a ramp or sloped area. The access aisle must be connected to an accessible route to the appropriate accessible entrance of a building or facility. The parking access aisle must either blend with the accessible route or have a curb ramp complying with 4.7. Such a curb ramp opening must be located within the access aisle boundaries, not within the parking space boundaries. Unfortunately, many facilities are designed with a ramp that is blocked when any vehicle parks in the accessible space. Also, the required dimensions of the access aisle cannot be restricted by planters, curbs or wheel stops.

A4.6.4 Signage. Signs designating parking places for disabled people can be seen from a driver's seat if the signs are mounted high enough above the ground and located at the front of a parking space.

A4.6.5 Vertical Clearance. High-top vans, which disabled people or transportation services often use, require higher clearances in parking garages than automobiles.

A4.8 Ramps.

A4.8.1 General. Ramps are essential for wheelchair users if elevators or lifts are not available to connect different levels. However, some people who use walking aids have difficulty with ramps and prefer stairs.

A4.8.2 Slope and Rise. *Ramp slopes between 1:16 and 1:20 are preferred.* The ability to manage an incline is related to both its slope and its length. Wheelchair users with disabilities affecting *their* arms or with low stamina have serious difficulty using inclines. Most ambulatory people and most people who use wheelchairs can manage a slope of 1:16. Many people cannot manage a slope of 1:12 for 30 ft (9 m).

A4.8.4 Landings. *Level landings are essential toward maintaining an aggregate slope that complies with these guidelines. A ramp landing that is not level causes individuals using wheelchairs to tip backward or bottom out when the ramp is approached.*

A4.8.5 Handrails. The requirements for stair and ramp handrails in this *guideline* are for adults. When children are principal users in a building or facility, a second set of handrails at an appropriate height can assist them and aid in preventing accidents.

A4.9 Stairs.

A4.9.1 Minimum Number. *Only interior and exterior stairs connecting levels that are not connected by an elevator, ramp, or other accessible means of vertical access have to comply with 4.9.*

A4.10 Elevators.

A4.10.6 Door Protective and Reopening Device. The required door reopening device would hold the door open for 20 seconds if the doorway remains obstructed. After 20 seconds, the door may begin to close. However, if designed in accordance with *ASME A17.1-1990*, the door closing movement could still be stopped if a person or object exerts sufficient force at any point on the door edge.

A4.10.7 Door and Signal Timing for Hall Calls. This paragraph allows variation in the location of call buttons, advance time for warning signals, and the door-holding period used to meet the time requirement.

A4.10.12 Car Controls. Industry-wide standardization of elevator control panel design would make all elevators significantly more convenient for use by people with severe visual impairments. In many cases, it will be possible to locate the highest control on elevator panels within 48 in (1220 mm) from the floor.

A4.10.13 Car Position Indicators. A special button may be provided that would activate the audible signal within the given elevator only for the desired trip, rather than maintaining the audible signal in constant operation.

A4.10.14 Emergency Communications. A device that requires no handset is easier to use by people who have difficulty reaching. *Also, small handles on handset compartment doors are not usable by people who have difficulty grasping.*

Ideally, emergency two-way communication systems should provide both voice and visual display intercommunication so that persons with hearing impairments and persons with vision impairments can receive information regarding the status of a rescue. A voice intercommunication system cannot be the only means of communication because it is not accessible to people with speech and hearing impairments. While a voice intercommunication system is not required, at a minimum, the system should provide both an audio and visual indication that a rescue is on the way.

A4.11 Platform Lifts *(Wheelchair Lifts).*

A4.11.2 Other Requirements. *Inclined stairway chairlifts, and inclined and vertical platform lifts (wheelchair lifts) are available* for short-distance, vertical transportation of people with disabilities. Care should be taken in selecting lifts *as some lifts are not equally suitable for use by both wheelchair users and semi-ambulatory individuals.*

A4.12 Windows.

A4.12.1 General. *Windows intended to be operated by occupants in accessible spaces should comply with 4.12.*

A4.12.2 Window Hardware. *Windows requiring pushing, pulling, or lifting to open (for example, double-hung, sliding, or casement and awning units without cranks) should require no more than 5 lbf (22.2 N) to open or close. Locks, cranks, and other window hardware should comply with 4.27.*

A4.13 Doors.

A4.13.8 Thresholds at Doorways. Thresholds and surface height changes in doorways are particularly inconvenient for wheelchair users who also have low stamina or restrictions in arm movement because complex maneuvering is required to get over the level change while operating the door.

A4.13.9 Door Hardware. Some disabled persons must push against a door with their chair or walker to open it. Applied kickplates on doors with closers can reduce required maintenance by withstanding abuse from wheelchairs and canes. To be effective, they should cover the door width, less approximately 2 in (51 mm), up to a height of 16 in (405 mm) from its bottom edge and be centered across the *width of the door.*

A4.13.10 Door Closers. Closers with delayed action features give a person more time to maneuver through doorways. They are particularly useful on frequently used interior doors such as entrances to toilet rooms.

A4.13.11 Door Opening Force. Although most people with disabilities can exert at least 5 lbf (22.2N), both pushing and pulling from a stationary position, a few people with severe disabilities cannot exert 3 lbf (13.13N). Although some people cannot manage the allowable forces in this guideline and many others have difficulty, door closers must have certain minimum closing forces to close doors satisfactorily. Forces for pushing or pulling doors open are measured with a push-pull scale under the following conditions:

(1) Hinged doors: Force applied perpendicular to the door at the door opener or 30 in (760 mm) from the hinged side, whichever is farther from the hinge.

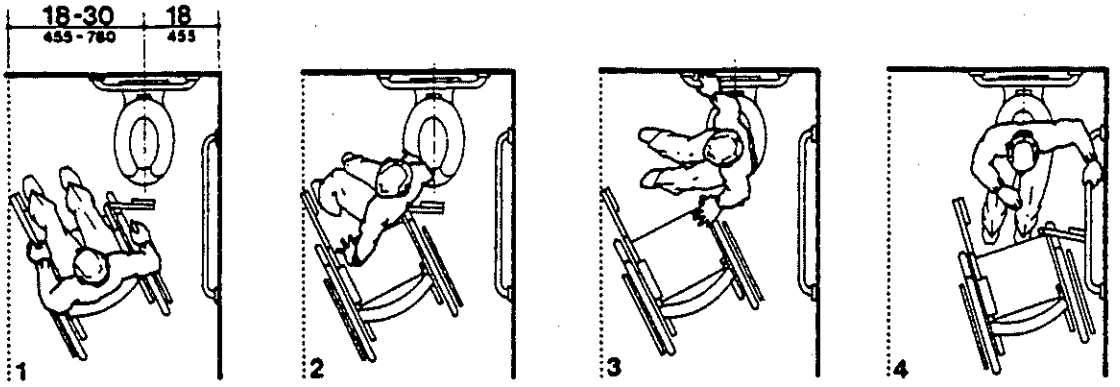
(2) Sliding or folding doors: Force applied parallel to the door at the door pull or latch.

(3) Application of force: Apply force gradually so that the applied force does not exceed the resistance of the door. In high-rise buildings, air-pressure differentials may require a modification of this specification in order to meet the functional intent.

A4.13.12 Automatic Doors and Power-Assisted Doors. Sliding automatic doors do not need guard rails and are more convenient for wheelchair users and visually impaired people to use. If slowly opening automatic doors can be reactivated before their closing cycle is completed, they will be more convenient in busy doorways.

A4.15 Drinking Fountains and Water Coolers.

A4.15.2 Spout Height. *Two drinking fountains, mounted side by side or on a single post, are usable by people with disabilities and people who find it difficult to bend over.*



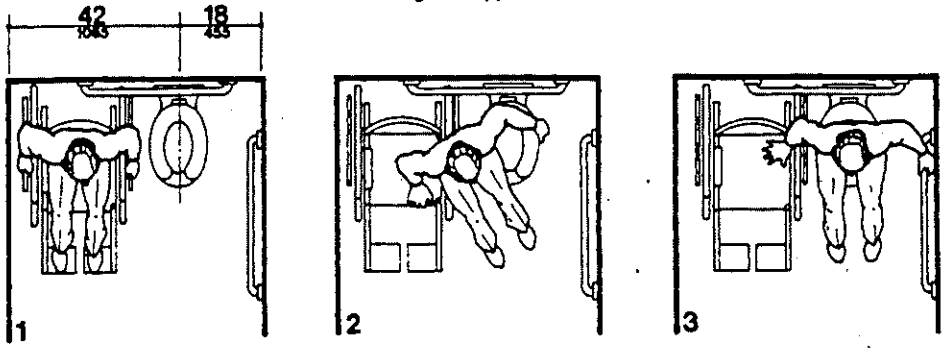
1 Takes transfer position, swings footrest out of the way, sets brakes.

2 Removes armrest, transfers.

3 Moves wheelchair out of the way, changes position (some people fold chair or pivot it 90° to the toilet).

4 Positions on toilet, releases brake.

(a)
Diagonal Approach



1 Takes transfer position, removes armrest, sets brakes.

2 Transfers.

3 Positions on toilet.

(b)
Side Approach

Fig. A6
Wheelchair Transfers

A4.16 Water Closets

A4.16 Water Closets.

A4.16.3 Height. Height preferences for toilet seats vary considerably among disabled people. Higher seat heights may be an advantage to some ambulatory disabled people, but are often a disadvantage for wheelchair users and others. Toilet seats 18 in (455 mm) high seem to be a reasonable compromise. Thick seats and filler rings are available to adapt standard fixtures to these requirements.

A4.16.4 Grab Bars. Fig. A6(a) and (b) show the diagonal and side approaches most commonly used to transfer from a wheelchair to a water closet. Some wheelchair users can transfer from the front of the toilet while others use a 90-degree approach. Most people who use the two additional approaches can also use either the diagonal approach or the side approach.

A4.16.5 Flush Controls. Flush valves and related plumbing can be located behind walls or to the side of the toilet, or a toilet seat lid can be provided if plumbing fittings are directly behind the toilet seat. Such designs reduce the chance of injury and imbalance caused by leaning back against the fittings. Flush controls for tank-type toilets have a standardized mounting location on the left side of the tank (facing the tank). Tanks can be obtained by special order with controls mounted on the right side. If administrative authorities require flush controls for flush valves to be located in a position that conflicts with the location of the rear grab bar, then that bar may be split or shifted toward the wide side of the toilet area.

A4.17 Toilet Stalls.

A4.17.3 Size and Arrangement. *This section requires use of the 60 in (1525 mm) standard stall (Figure 30(a)) and permits the 36 in (915 mm) or 48 in (1220 mm) wide alternate stall (Figure 30(b)) only in alterations where provision of the standard stall is technically infeasible or where local plumbing codes prohibit reduction in the number of fixtures. A standard stall provides a clear space on one side of the water closet to enable persons who use wheelchairs to perform a side or diagonal transfer from the wheelchair to the water closet. However, some persons with disabilities who use mobility aids such as walkers, canes or crutches are better able to use the two parallel grab bars in the 36 in (915 mm) wide alternate stall to achieve a standing position.*

In large toilet rooms, where six or more toilet stalls are provided, it is therefore required that a 36 in (915 mm) wide stall with parallel grab bars be provided in addition to the standard stall required in new construction. The 36 in (915 mm) width is necessary to achieve proper use of the grab bars; wider stalls would position the grab bars too far apart to be easily used and narrower stalls would position the grab bars too close to the water closet. Since the stall is primarily intended for use by persons using canes, crutches and walkers, rather than wheelchairs, the length of the stall could be conventional. The door, however, must swing outward to ensure a usable space for people who use crutches or walkers.

A4.17.5 Doors. To make it easier for wheelchair users to close toilet stall doors, doors can be provided with closers, spring hinges, or a pull bar mounted on the inside surface of the door near the hinge side.

A4.19 Lavatories and Mirrors.

A4.19.6 Mirrors. If mirrors are to be used by both ambulatory people and wheelchair users, then they must be at least 74 in (1880 mm) high at their topmost edge. A single full length mirror can accommodate all people, including children.

A4.21 Shower Stalls.

A4.21.1 General. Shower stalls that are 36 in by 36 in (915 mm by 915 mm) wide provide additional safety to people who have difficulty maintaining balance because all grab bars and walls are within easy reach. Seated people use the walls of 36 in by 36 in (915 mm by 915 mm) showers for back support. Shower stalls that are 60 in (1525 mm) wide and have no curb may increase usability of a bathroom by wheelchair users because the shower area provides additional maneuvering space.

A4.22 Toilet Rooms.

A4.22.3 Clear Floor Space. *In many small facilities, single-user restrooms may be the only*

A4.22 Toilet Rooms

facilities provided for all building users. In addition, the guidelines allow the use of "unisex" or "family" accessible toilet rooms in alterations when technical infeasibility can be demonstrated. Experience has shown that the provision of accessible "unisex" or single-user restrooms is a reasonable way to provide access for wheelchair users and any attendants, especially when attendants are of the opposite sex. Since these facilities have proven so useful, it is often considered advantageous to install a "unisex" toilet room in new facilities in addition to making the multi-stall restrooms accessible, especially in shopping malls, large auditoriums, and convention centers.

Figure 28 (section 4.16) provides minimum clear floor space dimensions for toilets in accessible "unisex" toilet rooms. The dotted lines designate the minimum clear floor space, depending on the direction of approach, required for wheelchair users to transfer onto the water closet. The dimensions of 48 in (1220 mm) and 60 in (1525 mm), respectively, correspond to the space required for the two common transfer approaches utilized by wheelchair users (see Fig. A6). It is important to keep in mind that the placement of the lavatory to the immediate side of the water closet will preclude the side approach transfer illustrated in Figure A6(b).

To accommodate the side transfer, the space adjacent to the water closet must remain clear of obstruction for 42 in (1065 mm) from the centerline of the toilet (Figure 28) and the lavatory must not be located within this clear space. A turning circle or T-turn, the clear floor space at the lavatory, and maneuvering space at the door must be considered when determining the possible wall locations. A privacy latch or other accessible means of ensuring privacy during use should be provided at the door.

RECOMMENDATIONS:

1. In new construction, accessible single-user restrooms may be desirable in some situations because they can accommodate a wide variety of building users. However, they cannot be used in lieu of making the multi-stall toilet rooms accessible as required.

2. Where strict compliance to the guidelines for accessible toilet facilities is technically infeasible in the alteration of existing facilities, accessible "unisex" toilets are a reasonable alternative.

3. In designing accessible single-user restrooms, the provisions of adequate space to allow a side transfer will provide accommodation to the largest number of wheelchair users.

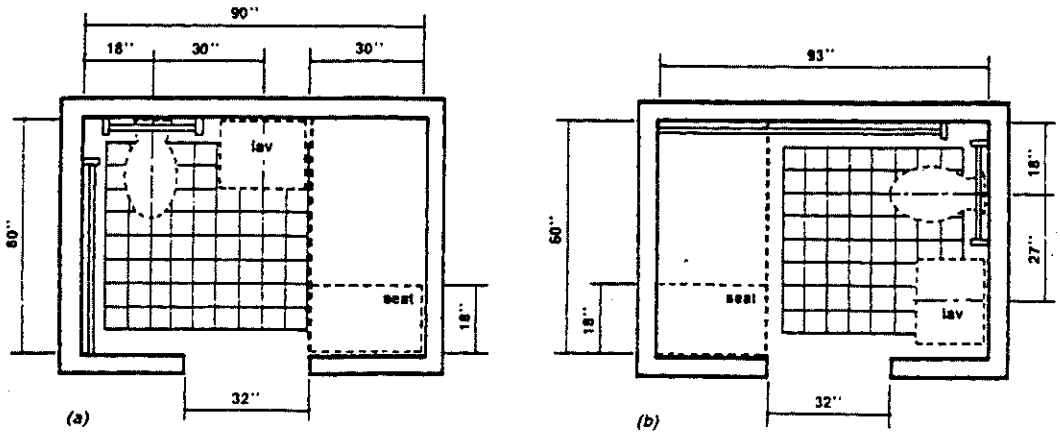


Fig. A7

A4.23 Bathrooms, Bathing Facilities, and Shower Rooms.

A4.23.3 Clear Floor Space. *Figure A7 shows two possible configurations of a toilet room with a roll-in shower. The specific shower shown is designed to fit exactly within the dimensions of a standard bathtub. Since the shower does not have a lip, the floor space can be used for required maneuvering space. This would permit a toilet room to be smaller than would be permitted with a bathtub and still provide enough floor space to be considered accessible. This design can provide accessibility in facilities where space is at a premium (i.e., hotels and medical care facilities). The alternate roll-in shower (Fig. 57b) also provides sufficient room for the "T-turn" and does not require plumbing to be on more than one wall.*

A4.23.9 Medicine Cabinets. Other alternatives for storing medical and personal care items are very useful to disabled people. Shelves, drawers, and floor-mounted cabinets can be provided within the reach ranges of disabled people.

A4.26 Handrails, Grab Bars, and Tub and Shower Seats.

A4.26.1 General. Many disabled people rely heavily upon grab bars and handrails to maintain balance and prevent serious falls. Many people brace their forearms between supports and walls to give them more leverage and stability in maintaining balance or for lifting. The grab bar clearance of 1-1/2 in (38 mm) required in this guideline is a safety clearance to prevent injuries resulting from arms slipping through the openings. It also provides adequate gripping room.

A4.26.2 Size and Spacing of Grab Bars and Handrails. This specification allows for alternate shapes of handrails as long as they allow an opposing grip similar to that provided by a circular section of 1-1/4 in to 1-1/2 in (32 mm to 38 mm).

A4.27 Controls and Operating Mechanisms.

A4.27.3 Height. *Fig. A8 further illustrates*

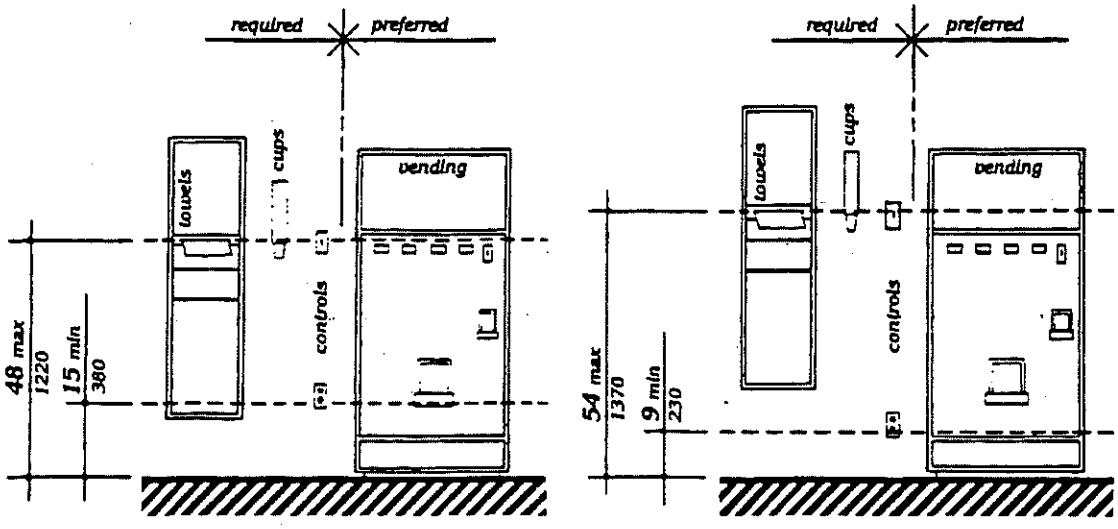


Fig. A8
Control Reach Limitations

mandatory and advisory control mounting height provisions for typical equipment.

Electrical receptacles installed to serve individual appliances and not intended for regular or frequent use by building occupants are not required to be mounted within the specified reach ranges. Examples would be receptacles installed specifically for wall-mounted clocks, refrigerators, and microwave ovens.

A4.28 Alarms.

A4.28.2 Audible Alarms. Audible emergency signals must have an intensity and frequency that can attract the attention of individuals who have partial hearing loss. People over 60 years of age generally have difficulty perceiving frequencies higher than 10,000 Hz. *An alarm signal which has a periodic element to its signal, such as single stroke bells (clang-pause-clang-pause), hi-low (up-down-up-down) and fast whoop (on-off-on-off) are best. Avoid continuous or reverberating tones. Select a signal which has a sound characterized by three or four clear tones without a great deal of "noise" in between.*

A4.28.3 Visual Alarms. The specifications in this section do not preclude the use of zoned or coded alarm systems.

A4.28.4 Auxiliary Alarms. Locating visual emergency alarms in rooms where persons who are deaf may work or reside alone can ensure that they will always be warned when an emergency alarm is activated. To be effective, such devices must be located and oriented so that they will spread signals and reflections throughout a space or raise the overall light level sharply. *However, visual alarms alone are not necessarily the best means to alert sleepers. A study conducted by Underwriters Laboratory (UL) concluded that a flashing light more than seven times brighter was required (110 candela v. 15 candela, at the same distance) to awaken sleepers as was needed to alert awake subjects in a normal daytime illuminated room.*

For hotel and other rooms where people are likely to be asleep, a signal-activated vibrator placed between mattress and box spring or under a pillow was found by UL to be much more effective in alerting sleepers. Many readily available devices are sound-activated so that they could respond to an alarm clock, clock radio, wake-up telephone call or room smoke detector. Activation by a building alarm system can either be accomplished by a separate circuit activating an auditory alarm which would, in turn, trigger the vibrator or by a signal transmitted through the ordinary 110-volt outlet. Transmission of signals through the power line is relatively simple and is the basis of common, inexpensive remote light control systems sold in many department and electronic stores for home use. So-called "wireless" intercoms operate on the same principal.

A4.29 *Detectable* Warnings.

A4.29.2 *Detectable* Warnings on Walking Surfaces. *The material used to provide contrast should contrast by at least 70%. Contrast in percent is determined by:*

$$Contrast = [(B_1 - B_2)/B_1] \times 100$$

where B_1 = light reflectance value (LRV) of the lighter area
and B_2 = light reflectance value (LRV) of the darker area.

Note that in any application both white and black are never absolute; thus, B_1 never equals 100 and B_2 is always greater than 0.

A4.30 Signage.

A4.30.1 General. In building complexes where finding locations independently on a routine basis may be a necessity (for example, college campuses), tactile maps or prerecorded instructions can be very helpful to visually impaired people. Several maps and auditory instructions have been developed and tested for specific applications. The type of map or instructions used must be based on the information to be communicated, which depends highly on the type of buildings or users.

Landmarks that can easily be distinguished by visually impaired individuals are useful as orientation cues. Such cues include changes in illumination level, bright colors, unique patterns, wall murals, location of special equipment or other architectural features.

Many people with disabilities have limitations in movement of their heads and reduced peripheral vision. Thus, signage positioned

A4.30 Signage

perpendicular to the path of travel is easiest for them to notice. People can generally distinguish signage within an angle of 30 degrees to either side of the centerlines of their faces without moving their heads.

A4.30.2 Character Proportion. The legibility of printed characters is a function of the viewing distance, character height, the ratio of the stroke width to the height of the character, the contrast of color between character and background, and print font. The size of characters must be based upon the intended viewing distance. A severely nearsighted person may have to be much closer to recognize a character of a given size than a person with normal visual acuity.

A4.30.4 Raised and Brailled Characters and Pictorial Symbol Signs (Pictograms). *The standard dimensions for literary Braille are as follows:*

Dot diameter	*.059 in.*
Inter-dot spacing	*.090 in.*
Horizontal separation between cells	*.241 in.*
Vertical separation between cells	*.395 in.*

Raised borders around *signs contatning* raised characters may make them confusing to read unless the border is set far away from the characters. *Accessible signage with descriptive materials about public buildings, monuments, and objects of cultural interest may not provide sufficiently detailed and meaningful information. Interpretive guides, audio tape devices, or other methods may be more effective in presenting such information.*

A4.30.5 Finish and Contrast. *An eggshell finish (11 to 19 degree gloss on 60 degree glossimeter) is recommended. Research indicates that signs are more legible for persons with low vision when characters contrast with their background by at least 70 percent. Contrast in percent shall be determined by:*

$$Contrast = [(B_1 - B_2)/B_1] \times 100$$

where B_1 = light reflectance value (LRV) of the lighter area
and B_2 = light reflectance value (LRV) of the darker area.

Note that in any application both white and black are never absolute; thus, B_1 never equals 100 and B_2 is always greater than 0.

The greatest readability is usually achieved through the use of light-colored characters or symbols on a dark background.

A4.30.7 Symbols of Accessibility for Different Types of Listening Systems. *Paragraph 4 of this section requires signage indicating the availability of an assistive listening system. An appropriate message should be displayed with the international symbol of access for hearing loss since this symbol conveys general accessibility for people with hearing loss. Some suggestions are:*

INFRARED
ASSISTIVE LISTENING SYSTEM
AVAILABLE
——PLEASE ASK——

AUDIO LOOP IN USE
TURN T-SWITCH FOR
BETTER HEARING
——OR ASK FOR HELP——

FM
ASSISTIVE LISTENING
SYSTEM AVAILABLE
——PLEASE ASK——

The symbol may be used to notify persons of the availability of other auxiliary aids and services such as: real time captioning, captioned note taking, sign language interpreters, and oral interpreters.

A4.30.8 Illumination Levels. *Illumination levels on the sign surface shall be in the 100 to 300 lux range (10 to 30 footcandles) and shall be uniform over the sign surface. Signs shall be located such that the illumination level on the surface of the sign is not significantly exceeded by the ambient light or visible bright lighting source behind or in front of the sign.*

A4.31 Telephones.

A4.31.3 Mounting Height. In localities where the dial-tone first system is in operation, calls can be placed at a coin telephone through the operator without inserting coins. The operator button is located at a height of 46 in. (1170 mm) if the coin slot of the telephone is at 54 in (1370 mm). A generally available public telephone with a coin slot mounted lower on the equipment would allow universal installation of telephones at a height of 48 in (1220 mm) or less to all operable parts.

A4.31.9 Text Telephones. *A public text telephone may be an integrated text telephone pay phone unit or a conventional portable text telephone that is permanently affixed within, or adjacent to, the telephone enclosure. In order to be usable with a pay phone, a text telephone which is not a single integrated text telephone pay phone unit will require a shelf large enough (10 in (255mm) wide by 10 in (255 mm) deep with a 6 in (150 mm) vertical clearance minimum) to accommodate the device, an electrical outlet, and a power cord. Movable or portable text telephones may be used to provide equivalent facilitation. A text telephone should be readily available so that a person using it may access the text telephone easily and conveniently. As currently designed pocket-type text telephones for personal use do not accommodate a wide range of users. Such devices would not be considered substantially equivalent to conventional text telephones. However, in the future as technology develops this could change.*

A4.32 *Fixed or Built-in* Seating and Tables.

A4.32.4 Height of *Tables or Counters.* Different types of work require different *table or counter* heights for comfort and optimal performance. Light detailed work such as writing requires a *table or counter* close to elbow height for a standing person. Heavy manual work such as rolling dough requires a *counter or table* height about 10 in (255 mm) below elbow height for a standing person. This principle of *high/low table or counter heights* also applies for seated persons; however, the limiting condition for seated manual work is clearance under the *table or counter.*

Table A1 shows convenient *counter heights* for seated persons. The great variety of heights for comfort and optimal performance indicates a need for alternatives or a compromise in height if people who stand and people who sit will be using the same counter area.

Table A1
Convenient Heights of Tables and Counters for Seated People[1]

Conditions of Use	Short Women in mm		Tall Men in mm	
Seated in a wheelchair:				
Manual work–				
Desk or removeable armrests	26	660	30	760
Fixed, full-size armrests[2]	32[3]	815	32[3]	815
Light detailed work:				
Desk or removable armrests	29	735	34	865
Fixed, full-size armrests[2]	32[3]	815	34	865
Seated in a 16-in. (405-mm) High chair:				
Manual work	26	660	27	685
Light detailed work	28	710	31	785

[1] All dimensions are based on a work-surface thickness of 1 1/2 in (38 mm) and a clearance of 1 1/2 in (38 mm) between legs and the underside of a work surface.

[2] This type of wheelchair arm does not interfere with the positioning of a wheelchair under a work surface.

[3] This dimension is limited by the height of the armrests: a lower height would be preferable. Some people in this group prefer lower work surfaces, which require positioning the wheelchair back from the edge of the counter.

A4.33 Assembly Areas.

A4.33.2 Size of Wheelchair Locations. Spaces large enough for two wheelchairs allow people who are coming to a performance together to sit together.

A4.33.3 Placement of Wheelchair Locations. The location of wheelchair areas can be planned so that a variety of position

Table A2. Summary of Assistive Listening Devices

within the seating area are provided. This will allow choice in viewing and price categories.

Building/life safety codes set minimum distances between rows of fixed seats with consideration of the number of seats in a row, the exit aisle width and arrangement, and the location of exit doors. "Continental" seating, with a greater number of seats per row and a commensurate increase in row spacing and exit doors, facilitates emergency egress for all people and increases ease of access to mid-row seats especially for people who walk with difficulty. Consideration of this positive attribute of "continental" seating should be included along with all other factors in the design of fixed seating areas.

Table A2. Summary of Assistive Listening Devices

System	Advantages	Disadvantages	Typical Applications
Induction Loop Transmitter: Transducer wired to induction loop around listening area. Receiver: Self-contained induction receiver or personal hearing aid with telecoil.	Cost-Effective Low Maintenance Easy to use Unobtrusive May be possible to integrate into existing public address system. Some hearing aids can function as receivers.	Signal spills over to adjacent rooms. Susceptible to electrical interference. Limited portability Inconsistent signal strength. Head position affects signal strength. Lack of standards for induction coil performance.	Meeting areas Theaters Churches and Temples Conference rooms Classrooms TV viewing
FM Transmitter: Flashlight-sized worn by speaker. Receiver: With personal hearing aid via DAI or induction neck-loop and telecoil; or self-contained with earphone(s).	Highly portable Different channels allow use by different groups within the same room. High user mobility Variable for large range of hearing losses.	High cost of receivers Equipment fragile Equipment obtrusive High maintenance Expensive to maintain Custom fitting to individual user may be required.	Classrooms Tour groups Meeting areas Outdoor events One-on-one
Infrared Transmitter: Emitter in line-of-sight with receiver. Receiver: Self-contained. Or with personal hearing aid via DAI or induction neckloop and telecoil.	Easy to use Insures privacy or confidentiality Moderate cost Can often be integrated into existing public address system.	Line-of-sight required between emitter and receiver. Ineffective outdoors Limited portability Requires installation	Theaters Churches and Temples Auditoriums Meetings requiring confidentiality TV viewing

Source: Rehab Brief, National Institute on Disability and Rehabilitation Research, Washington, DC, Vol. XII, No. 10, (1990).

A4.33.6 Placement of Listening Systems. A distance of 50 ft (15 m) allows a person to distinguish performers' facial expressions.

A4.33.7 Types of Listening Systems. *An assistive listening system appropriate for an assembly area for a group of persons or where the specific individuals are not known in advance, such as a playhouse, lecture hall or movie theater, may be different from the system appropriate for a particular individual provided as an auxiliary aid or as part of a reasonable accommodation. The appropriate device for an individual is the type that individual can use, whereas the appropriate system for an assembly area will necessarily be geared toward the "average" or aggregate needs of various individuals.* A listening system that can be used from any seat in a seating area is the most flexible way to meet this specification. Earphone jacks with variable volume controls can benefit only people who have slight hearing loss and do not help people who use hearing aids. At the present time, *magnetic induction* loops are the most feasible type of listening system for people who use hearing aids *equipped with "T-coils,"* but people without hearing aids or those with hearing aids not equipped with inductive pick-ups cannot use them *without special receivers.* Radio frequency systems can be extremely effective and inexpensive. People without hearing aids can use them, but people with hearing aids need a special receiver to use them as they are presently designed. If hearing aids had a jack to allow a by-pass of microphones, then radio frequency systems would be suitable for people with and without hearing aids. Some listening systems may be subject to interference from other equipment and feedback from hearing aids of people who are using the systems. Such interference can be controlled by careful engineering design that anticipates feedback sources in the surrounding area.

Table A2, reprinted from a National Institute of Disability and Rehabilitation Research "Rehab Brief," shows some of the advantages and disadvantages of different types of assistive listening systems. In addition, the Architectural and Transportation Barriers Compliance Board (Access Board) has published a pamphlet on Assistive Listening Systems which lists demonstration centers across the country where technical assistance can be obtained in selecting and installing appropriate systems. The state of New York has also adopted a detailed technical specification which may be useful.

A5.0 Restaurants and Cafeterias.

A5.1 General. *Dining counters (where there is no service) are typically found in small carry-out restaurants, bakeries, or coffee shops and may only be a narrow eating surface attached to a wall. This section requires that where such a dining counter is provided, a portion of the counter shall be at the required accessible height.*

A7.0 Business and Mercantile.

A7.2(3) Assistive Listening Devices. *At all sales and service counters, teller windows, box offices, and information kiosks where a physical barrier separates service personnel and customers, it is recommended that at least one permanently installed assistive listening device complying with 4.33 be provided at each location or series. Where assistive listening devices are installed, signage should be provided identifying those stations which are so equipped.*

A7.3 Check-out Aisles. *Section 7.2 refers to counters without aisles; section 7.3 concerns check-out aisles. A counter without an aisle (7.2) can be approached from more than one direction such as in a convenience store. In order to use a check-out aisle (7.3), customers must enter a defined area (an aisle) at a particular point, pay for goods, and exit at a particular point.*

A10.3 Fixed Facilities and Stations.

A10.3.1(7) Route Signs. *One means of making control buttons on fare vending machines usable by persons with vision impairments is to raise them above the surrounding surface. Those activated by a mechanical motion are likely to be more detectable. If farecard vending, collection, and adjustment devices are designed to accommodate farecards having one tactually distinctive corner, then a person who has a vision impairment will insert the card with greater ease. Token collection devices that are designed to accommodate tokens which are perforated can allow a person to distinguish more readily between tokens and common coins. Thoughtful placement of accessible gates and fare vending machines in relation to inaccessible devices will make their use and detection easier for all persons with disabilities.*

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Comm 69.10/ADAAG 4.1.6 GENERAL INFORMATION ON ALTERATION, PATH OF TRAVEL AND DISPROPORTIONALITY REQUIREMENTS

Comm 69.10(3) & ADAAG 4.1.6 (1) Alterations: General *When alterations or remodeling are undertaken in an existing building, each such altered element, space, feature, or area shall comply with the applicable provisions of ADAAG 4.1.1 to 4.1.3, Minimum Requirements for New Construction. No alteration shall be undertaken which decreases or has the effect of decreasing accessibility of a building or facility below the requirements for new construction at the time of alteration.*

What is an alteration? *An alteration is any change that affects usability. It includes remodeling, renovation, rearrangements in structural parts, and changes or rearrangement of doors, exits, walls and full-height partitions. Normal maintenance, reroofing, painting, wallpapering, asbestos removal, and changes to electrical and mechanical systems are not "alterations," unless they affect usability.*

ILLUSTRATION 1: A doorway is being relocated and a new door will be installed. The new doorway must be wide enough to meet ADAAG. The new door must have appropriate hardware that can be used without grasping, twisting, or pinching of the wrist.

ILLUSTRATION 2: An electrical outlet is being relocated. The location of the new outlet can affect usability by an individual who uses a wheelchair because, if the outlet is placed too low, the individual will be unable to reach it. This then, is an alteration that must be done in accordance with ADAAG reach requirements.

BUT, if only the electrical wiring inside the wall is being changed with no change to the fixture locations, usability by an individual with disabilities is not affected. Thus, the wiring need not be done in compliance with ADAAG, because it is not an "alteration."

What does "maximum extent feasible" mean? *Occasionally, the nature of a facility makes it impossible to comply with all of the alterations standards. In such as case, features must only be made accessible to the extent that it is technically feasible to do so. The fact that adding accessibility features during an alteration may increase costs does* not *mean compliance is technically infeasible. Cost is not to be considered. Moreover, even when it may be technically infeasible to comply with standards for individuals with certain disabilities (for instance, those who use wheelchairs), the alteration must still comply with standards for individuals with other impairments.*

ILLUSTRATION 1: A restaurant is undergoing a major renovation. Widening the entrance would affect the building structure because removal of an essential part of the structural frame would be required. However, all other ADAAG alterations requirements apply to the renovation.

BUT: If the only problem with widening the entrance is that it would increase the cost of the renovation, the "technically infeasible" exception does not apply, and the entrance must be widened.

ADAAG 4.1.6 (2) Alterations: Path of travel. *When an alteration is made to a "primary function area," not only must that alteration be done in compliance with ADAAG, but there must also be an accessible path of travel from the altered area to the entrance. The "path of travel" requirement includes an accessible route to the altered area and the bathrooms, telephones, and drinking fountains serving the area. Alterations to provide an accessible path of travel are required to the extent that they are not "disproportionate" to the original alteration, that is, to the extent that the added accessibility costs do not exceed 20 percent of the cost of the original alteration to the primary function area.*

What is a primary function area? *It is any area where a major activity takes place. It includes both the customer services areas and work areas in places of public accommodation. It includes all offices and work areas in commercial facilities. It does not include mechanical rooms, boiler rooms, employee lounges or locker rooms, janitorial closets, entrances, corridors, or toilet rooms.*

ILLUSTRATION 1: The customer service area of a dry cleaning store and the employee area behind the counter are both primary function areas.

ILLUSTRATION 2: Remodeling an office is an alteration to a primary function area. But remodeling the employee toilet rooms is not an alteration to a primary function area.

ILLUSTRATION 3: The availability of public toilet rooms at a roadside rest stop may be a major factor affecting a customer's decision to patronize this public accommodation. In this case, a toilet room would be considered to be an "area containing a primary function" of the facility.

What is a "path of travel?" *It is a continuous unobstructed way of pedestrian passage to the altered area. It can include sidewalks, streets, parking areas, an entrance, lobbies, corridors, rooms and elevators. It also includes phones, rest rooms, and drinking fountains serving the altered area.*

Does this mean that every single time any minor alteration is made in a primary function area, the "path of travel" requirement is triggered? In other words, does a simple thing like changing door hardware trigger the path of travel requirement? *No. There are some alterations that will* never *trigger the path of travel requirement. It is the intent that alterations to windows, hardware, controls, electrical outlets, and signs will not trigger path of travel requirements. (If they affect usability, however, they are still considered to be "alterations" and must be done accessibly). ADAAG gives some additional exceptions: the path of travel requirement is not triggered if alteration work is limited solely to the electrical, mechanical, or plumbing system, hazardous material abatement, or automatic sprinkler retrofitting, unless the project involves alteration to elements required to be accessible.*

ILLUSTRATION 1: An office building manager is replacing all the room number signs. This is an "alteration" because it can affect usability by an individual who is blind. Thus, the new signs must comply with ADAAG requirements for permanent signs. However, the path of travel requirement is not triggered. Even though an alteration is being made in a primary function area, alterations to "signs" are in the list of alterations that will never trigger the path of travel requirement.

ILLUSTRATION 2: The building manager now replaces the men's and women's room signs. Again this is an alteration because it can affect usability, and the new signs must comply with ADAAG. Here, the path of travel requirements are not triggered for two separate reasons. First, as in the above case, the alteration is to "signs" and thus will never trigger the path of travel requirement. In addition, in this case, the alteration is to the rest room. Rest rooms are not primary function areas except in limited circumstances, such as highway rest stops.

What costs can be included as expenditures required to provide a path of travel in determining whether the 20 percent disproportionality limitation has been met? *Widening doorways, installing ramps, making bathrooms accessible, lowering telephones, relocating water fountains - as well as any other costs associated with making the path accessible - can be included. (See item B. on Disproportionality form)*

What if the cost of making an accessible path of travel would exceed the cost of the original alteration by much more than 20 percent? In such a case, is the entity exempt from the path of travel requirement? *No. The entity must still make the path of travel accessible to the extent possible without going over 20 percent, giving priority to those elements that provide the greatest degree of access. Changes should be made in the following order: accessible entrance, accessible route to the altered area, at least one accessible rest room for each sex or single unisex rest room, phones, drinking fountains, and then other elements such as parking, storage, and alarms.*

ILLUSTRATION : A library is remodeling its reading area for a total cost of $20,000. The library must spend, if necessary, up to an additional $4,000 (20 percent of

$20,000) on "path of travel" costs. For $4,000 the library can install a ramp leading to the reading area, and it can lower telephones and drinking fountains. For $3,500 the library can create an accessible rest room. Because the most important path of travel element is the entrance and route to the area, the library should spend the money on the ramp, telephones, and drinking fountains.

Can an entity limit its path of travel obligation by engaging in a series of small alterations? *No. An entity cannot evade the path of travel requirement by doing several small alterations (each of which, if considered by itself, wound be so inexpensive that adding 20 percent would not result in addition of path of travel features). Whenever an area containing a primary function is altered, other alterations to that area (or to other areas on the same path of travel) made within the preceding three years are considered together in determining disproportionality. Only alterations after December 1, 1994, are counted. In other words, all of the alterations to the same path of travel taken within the preceding three years are considered together in deciding whether the 20 percent has been reached.*

ILLUSTRATION : On February 1, 1995, a nursery school with several steps at its entrance renovates one of its classrooms. The renovations total $500 triggering up to $100 worth of path of travel obligations (20 percent of $500). Because $100 will not buy a ramp and because no other accessible features needed in that particular nursery school can be added for $100, no path of travel features are added. On October 1, 1995, more renovations are done at a cost of $1,000, this time triggering path of travel obligations of up to $200. As before, no path of travel features are added. Then, on March 1, 1996, another minor renovation ($2,000) is made to the same area, this time triggering path of travel obligations of up to $400. Had the nursery school done all three small renovations at the same time, the cost would have been $3,500, triggering a path of travel obligation of up to $700. For $700, an accessible ramp could have been installed.

In determining amounts that must be spent on path of travel features at the time of the March 1, 1996, renovation, the nursery school must spend up to 20 percent not just of the $2,000 renovation taking place on March 1, but, rather, up to 20 percent of all *of the renovations in the preceding three years put together. Thus, on March 1, 1996, the nursery school must spend up to 20 percent of $3,500 or $700 (the total cost of the three small renovations) rather than up to 20 percent of $2,000 or $400 (the cost of just the March 1, 1996, renovation).*

SAMPLE

DISPROPORTIONALITY FORM

(SBD-10219)

Disproportionality form, SBD 10219, shall be submitted with the plan application form and plans at the time of building plan review.

The plan reviewer will determine compliance with the alteration requirements specified in chapter COMM 69.

PROJECT INFORMATION

BUILDING LOCATION:

123 Main Street

STREET ADDRESS

Madison, Wisconsin

CITY, VILLAGE, TOWNSHIP

John Doe

OWNER'S NAME (PLEASE PRINT)

OWNER'S SIGNATURE

DATE OF ALTERATION: *October 20, 1995*

SAMPLE
DISPROPORTIONALITY
COMM 69.10 (3) AND ADAAG 4.1.6 (2)

A. TOTAL COST OF ALTERATION TO PRIMARY FUNCTION AREA.

(Excluding costs in B.) $ *20,000*

MINIMUM EXPENDITURES FOR PATH OF TRAVEL: $ *4,000*

20% of total cost of alteration to a primary function

B. COSTS THAT MAY BE COUNTED AS EXPENDITURES REQUIRED TO PROVIDE A PATH OF TRAVEL (Listed in order of priority in the event of disproportionality):

1. Costs associated with providing an accessible entrance $ *2,000*
2. Costs associated with providing accessible route to the altered area: $ *1,000*
3. Costs associated with making toilet rooms accessible, such as installing grab bars, enlarging toilet stalls, insulating pipes or installing accessible faucet controls: $ *3,500*
4. Costs associated with providing accessible telephones, such as relocating the telephone to an accessible height, installing amplification devices or installing TTY's: $ 400
5. Costs associated with relocating an inaccessible drinking fountain: $ *600*
6. Costs associated with providing accessible elements such as parking, storage and alarms. $ ---

TOTAL COSTS TO PROVIDE PATH OF TRAVEL: $ *7,500*

C. DISPROPORTIONATE COSTS:

If the total cost of the expenditures in B. is greater than 20% of the total cost of the alteration in A., list the accessibility features that will equal or exceed 20% of the total cost of the alteration.

1. Entrance	2,000
2.Accessible Route	1,000
4. Telephones	400
5. Drinking Facilities	600
TOTAL:$	4,000

SBD-10219 (N.10/95)

DISPROPORTIONALITY FORM

(SBD-10219)

Disproportionality form, SBD 10219, shall be submitted with the plan application form and plans at the time of building plan review.

The plan reviewer will determine compliance with the alteration requirements specified in chapter COMM 69.

PROJECT INFORMATION

BUILDING LOCATION:

_____

STREET ADDRESS

_____

CITY, VILLAGE, TOWNSHIP

_____

OWNER'S NAME (PLEASE PRINT)

_____

OWNER'S SIGNATURE

DATE OF ALTERATION: _____

DISPROPORTIONALITY
COMM 69.10 (3) AND ADAAG 4.1.6 (2)

A. TOTAL COST OF ALTERATION TO PRIMARY FUNCTION AREA.
(Excluding costs in B.) $_____

MINIMUM EXPENDITURES FOR PATH OF TRAVEL: $_____

20% of total cost of alteration to a primary function

B. COSTS THAT MAY BE COUNTED AS EXPENDITURES REQUIRED TO PROVIDE A PATH OF TRAVEL (Listed in order of priority in the event of disproportionality):

1. Costs associated with providing an accessible entrance $_____
2. Costs associated with providing accessible route to the altered area: $_____
3. Costs associated with making toilet rooms accessible, such as installing grab bars, enlarging toilet stalls, insulating pipes or installing accessible faucet controls: $_____
4. Costs associated with providing accessible telephones, such as relocating the telephone to an accessible height, installing amplification devices or installing TTY's: $_____
5. Costs associated with relocating an inaccessible drinking fountain: $_____
6. Costs associated with providing accessible elements such as parking, storage and alarms. $_____

TOTAL COSTS TO PROVIDE PATH OF TRAVEL: $_____

C. DISPROPORTIONATE COSTS:

If the total cost of the expenditures in B. is greater than 20% of the total cost of the alteration in A., list the accessibility features that will equal or exceed 20% of the total cost of the alteration.

_____

_____

_____

_____

TOTAL:$_____

SBD-10219 (N.10/95)

Comm 69.15 - Four-hour fire division walls, when not located on a property line, do not constitute separate buildings for accessibility purposes.

Comm 69.182/ADAAG 4.28.1 - It is the intent of this section that all classrooms in schools have visual alarms in each classroom.

Comm 69.18(3)/ADAAG 4.1.3 (9). AREAS OF RESCUE ASSISTANCE

Recently, there have been numerous questions relative to areas of rescue assistance and how the Department has interpreted ch. COMM 69/ADAAG 4.1.3 (9). We have contacted various federal and state offices on this subject and offer the following information and explanation.

The intent of areas of rescue assistance as specified in ADAAG 4.1.3 (9) is to provide people who cannot traverse stairs or have difficulty in traversing stairs a safe place to wait until rescue personnel can assist them in evacuating the building. In an emergency situation, stairways are the only path of travel to leave a multistory building. The intent of providing areas of rescue assistance at stairways, is that stairways are generally designed to provide a safe means of isolating building occupants from smoke and fire. Once people have entered the stairway, they are protected from the heat and smoke until they reach the exit discharge and safety.

The areas of rescue assistance rules were based on model code definitions of "exit, exit access and exit discharge" where an exit stairway must be enclosed to provide a protected way of travel to the exit discharge. In accordance with the Wisconsin Building Code, areas of rescue assistance shall be provided at stairways complying with s. ILHR 51.18. It is not the intent to require areas of rescue assistance at open stairway or other interior stairways that are not required to be enclosed as specified in s. ILHR 51.18. Open exit stairways permitted under s. ILHR 54.08 (1) (b) 2. would not be required to provide an area of rescue assistance, since they do not provide a protected way of travel to the exit discharge. Some people with disabilities have expressed concern that areas of rescue assistance not built in or connected to an enclosed stairway may actually obscure them or make them less visible to others evacuating the building by the open stairways.

The code interpretation relative to areas of rescue assistance is modified to reflect this information and includes the location of areas of rescue assistance in buildings or facilities with different exiting situations.

***QUESTION 1:** When are areas of rescue assistance required to be provided in buildings or facilities?*

***ANSWER 1:** Areas of rescue assistance are required at all inaccessible exits from occupiable floor levels above or below the level of accessible exit discharge. Areas of rescue assistance are required in all buildings and facilities whether vertical access between floor levels is provided or not.*

Note: For areas of rescue assistance in covered multifamily housing, please refer to Informational Notice #159, issued March 27, 1995.

QUESTION 2: *How is the term "exit" defined as used in ADAAG 4.1.3 (9)?*
ANSWER 2: *In accordance with s. ILHR 51.01 (36a), "exit" means that portion of a means of egress which is separated from all other spaces of the building or structure by construction providing a protected way of travel to the exit discharge. Areas of rescue assistance shall be provided at all exits complying with s. ILHR 51.01 (36a). Areas of rescue assistance are not required at open stairways or other interior stairways that are not required to be enclosed as specified in s. ILHR 51.18.*

QUESTION 3: *Who is the "appropriate local authority" as specified in ADAAG 4.3.11.2 for reducing the number of areas of rescue assistance spaces in buildings?*
ANSWER 3: *The state department or certified municipality or agent performing the plan review function is considered the "appropriate local authority" having jurisdiction.*

QUESTION 4: *Are areas of rescue assistance required at all exits from floor levels used for storage?*
ANSWER 4: *No. Areas of rescue assistance will not be required at exits from floor levels used for storage, provided the following conditions are met:*

1. The floor level is used for the storage of goods, merchandise, products or wares; and

2. The floor level is not used as the permanent workstation for any employee, is not used as a common-use area for employes; and is not used by the public for any reason..

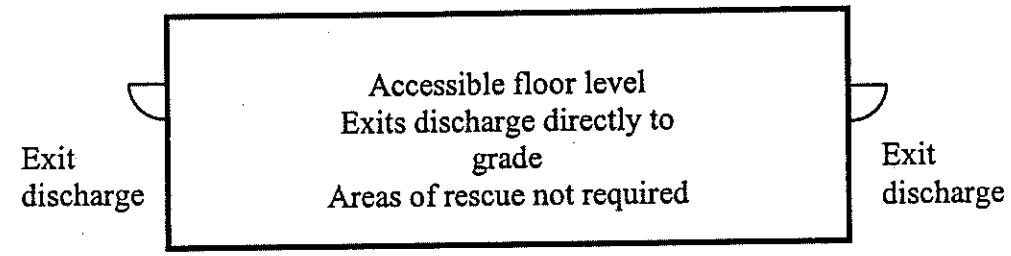
If the use of the floor level changes to that of an occupied space, the building shall be altered to comply with the area of rescue assistance requirements specified in chapter COMM 69, ADAAG 4.1.3 (9) for new construction.

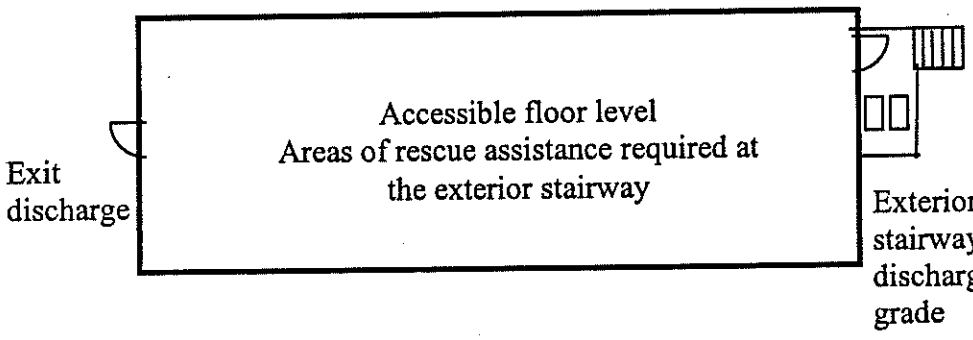
QUESTION 5: *Are areas of rescue assistance required at exits in open parking garages?*
ANSWER 5: *No. In accordance with the preamble for the ADAAG standards published in the July 21, 1991, Federal Register, the scoping provisions in ADAAG 4.1.3 (9) for areas of rescue assistance do not apply to open parking garages covered by ADAAG 4.1.2.*

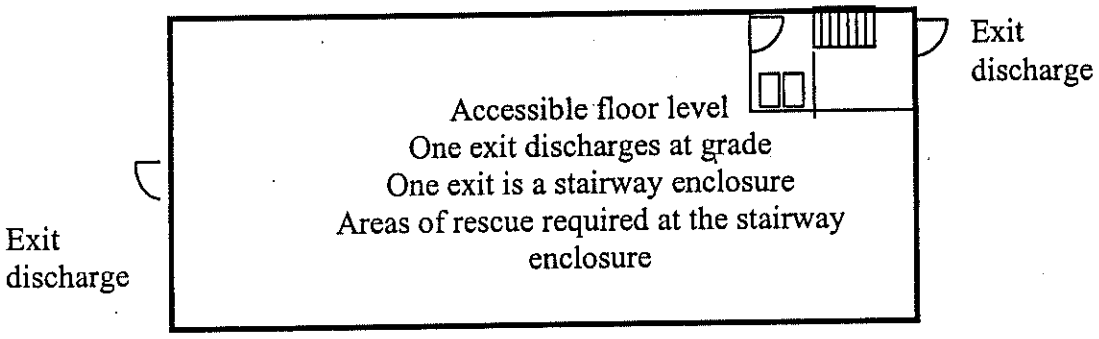
QUESTION 6: *What is meant by a supervised automatic sprinkler system as used in the Exception to ADAAG 4.1.3 (9)?*
ANSWER 6: *The building or facility must have an automatic sprinkler system that is supervised or monitored in accordance with s. ILHR 51.23 (9).*

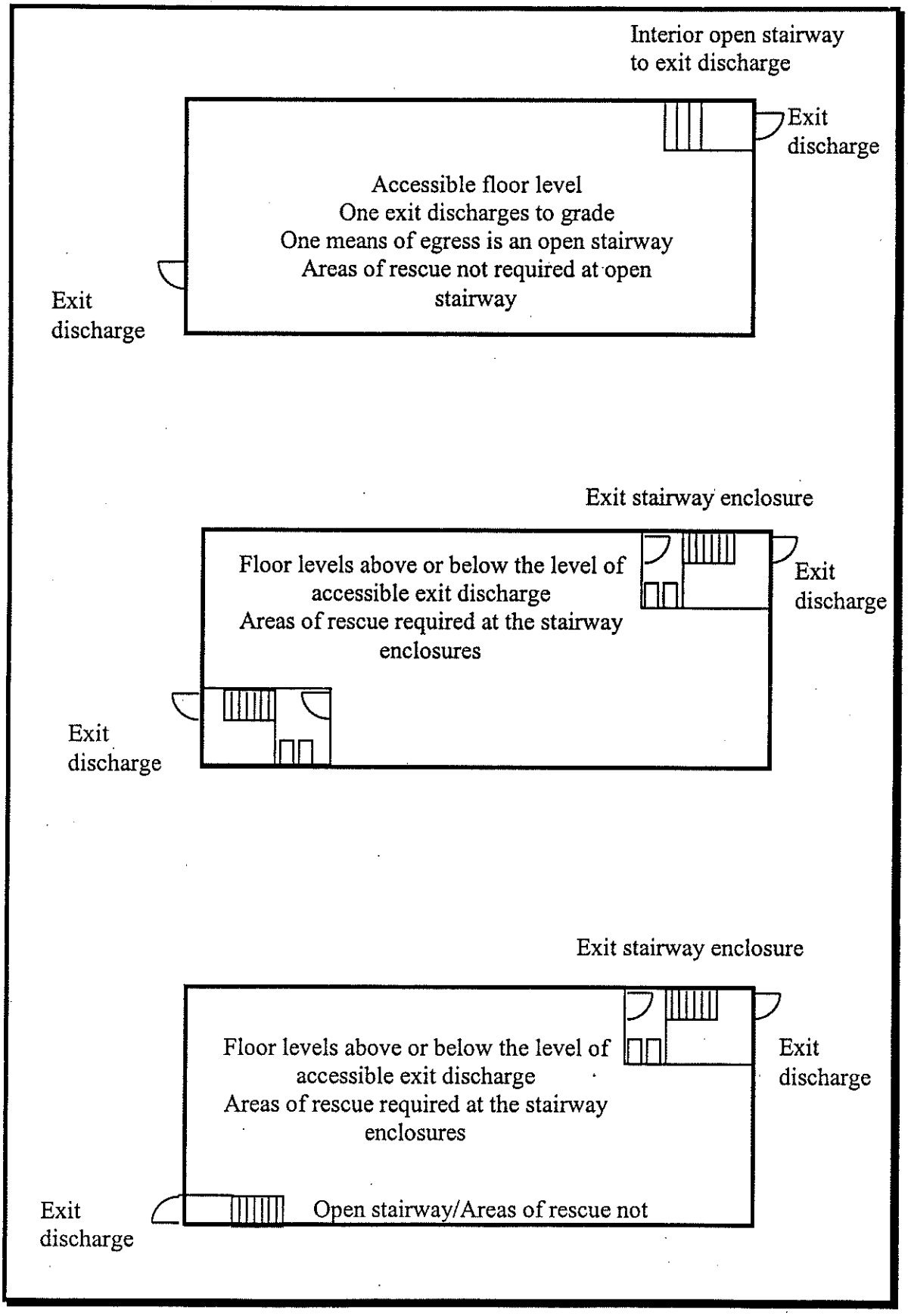
TYPICAL EXAMPLES FOR LOCATING AREAS OF RESCUE ASSISTANCE

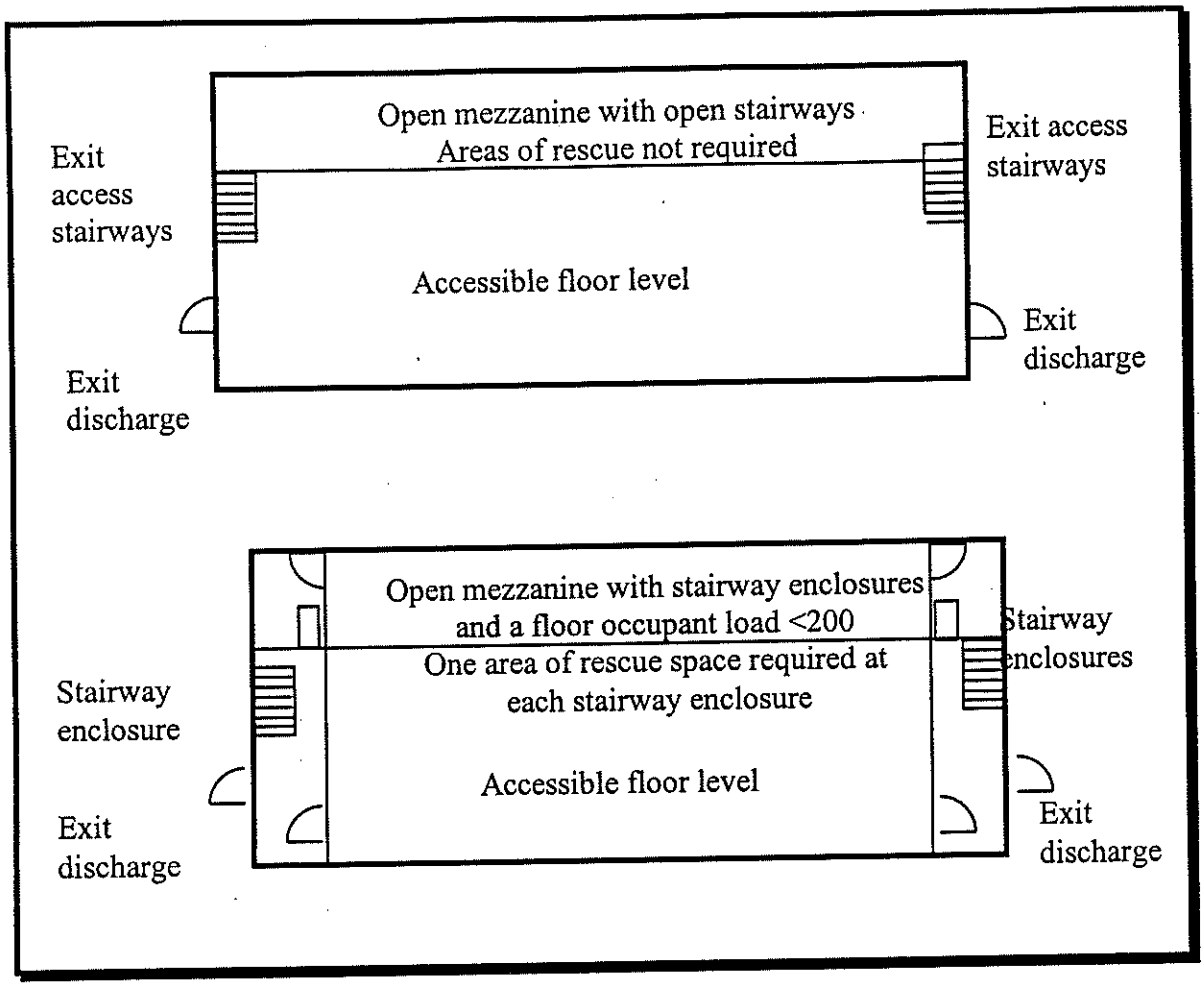
(When areas of rescue assistance are required, they shall be designed and installed in accordance with s. COMM 69.23 and ADAAG 4.3.11.)








Interior open stairway
to exit discharge
Exit
discharge
Accessible floor level
One exit discharges to grade
One means of egress is an open stairway
Areas of rescue not required at open
stairway
Exit
discharge
Exit stairway enclosure
Floor levels above or below the level of
accessible exit discharge
Areas of rescue required at the stairway
enclosures
Exit
discharge
Exit
discharge
Exit stairway enclosure
Floor levels above or below the level of
accessible exit discharge
Areas of rescue required at the stairway
enclosures
Exit
discharge
Exit
discharge
Open stairway/Areas of rescue not



Comm 69.28 - What are the maximum vertical travel distances for vertical platform lifts and limited-use elevators?

Answer: Vertical platform lifts are limited to 12 feet and limited-use elevators are limited to 25 feet.

Comm 69.415(2) Is an overhead door acceptable as the only door into a mini-storage building?

Answer: Yes, providing that the overhead door complies with the 5 lbs. of force for operation specified in ADAA 4.13.11 and that all locking/unlocking mechanisms and door handles comply with ADAAG 4.13.9.

***Comm 69.42/ADAAG 9.1.2** - The figures for accessible rooms and rooms with roll-in showers are to be added together to get the total number of accessible rooms to be provided.*

Chapter Comm70

Historic Buildings

Following is the official code only for this chapter. It is a voluntary code that owners may elect to use in its entirety when altering a designated, historic building, so as to preserve the buildings historic fabric and provide equivalent life-safety and other building code compliance. If you desire further information, contact one of the Historic Building Code plan reviewers listed in the front of the Commentary.

Chapter Comm 70

HISTORIC BUILDINGS

Subchapter I — Purpose, Scope and Application
Comm 70.001 Authority.
Comm 70.01 Purpose.
Comm 70.02 Scope.
Comm 70.03 Election of code.
Comm 70.04 Impact of other codes on qualified historic buildings.
Comm 70.05 Verification of a qualified historic building.
Comm 70.06 Application of historic building code.

Subchapter II —Administration and Enforcement
Comm 70.07 Plan examination.
Comm 70.08 Approvals.
Comm 70.09 Evidence of plan approval.
Comm 70.10 Revocation of approval.
Comm 70.11 Expiration of plan approval.
Comm 70.12 Inspections.
Comm 70.13 Fees.
Comm 70.14 Petition for variance.
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Subchapter III —Definitions
Comm 70.17 Definitions.

Subchapter IV —Building Evaluation Method
Comm 70.20 Scope.
Comm 70.21 Building evaluation method.
Comm 70.22 Building evaluation procedures.
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Subchapter V —Miscellaneous Building Requirements
Comm 70.25 Purpose.
Comm 70.26 Atriums.
Comm 70.27 Roof coverings.
Comm 70.28 Illuminated exit signs.
Comm 70.29 Fire escapes.
Comm 70.30 Stairway requirements.
Comm 70.31 Guardrails.
Comm 70.32 Doors.
Comm 70.33 Sanitary facilities.

Subchapter VI —Alternate Structural Requirements
Comm 70.35 Purpose.
Comm 70.36 Scope.
Comm 70.37 Application.
Comm 70.38 Structural report.
Comm 70.39 Alternative standards.
Comm 70.40 Use of archaic materials.

Subchapter VII —Alternate Accessibility Requirements
Comm 70.41 Purpose.
Comm 70.42 Accessibility requirements.

Subchapter VIII —Alternate Energy Conservation Requirements
Comm 70.46 Purpose.
Comm 70.47 Scope.
Comm 70.48 Application.
Comm 70.49 Definitions.
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Subchapter IX —Alternate Mechanical Requirements
Comm 70.55 Purpose.
Comm 70.56 Application.

Subchapter X —Alternate Electrical Requirements
Comm 70.58 Purpose.
Comm 70.59 Application.

Subchapter XI —Totally Preserved Buildings Used As Historical Exhibits
Comm 70.62 Scope.
Comm 70.63 Historic exhibits.
Comm 70.64 Sanitary requirements.

Note: Chapter Comm 70 as it existed on January 31, 1998 was renumbered Chapter Comm 70 under s. 13.93 (2m) (b) 1., Stats., and corrections made under s. 13.93 (2m) (b) 7., Stats., Register, January, 1998, No. 505.

Subchapter I — Purpose, Scope and Application

Comm 70.001 Authority. Chapter Comm 70 constitutes the historic building code and is promulgated under the authority of ss. 101.121 (3) and 101.13 (9), Stats.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.01 Purpose. The purpose of ch. Comm 70 is to:

(1) Provide alternative building standards for preserving or restoring buildings or structures designated as historic buildings;

(2) Facilitate the restoration of historic buildings so as to preserve their original or restored architectural elements and features;

(3) Encourage energy conservation;

(4) Permit a cost–effective approach to historic preservation and restoration;

(5) Provide for the health, safety and welfare of occupants and visitors in qualified historic buildings;

(6) Provide a process for the department to grant variances in order to permit the proper preservation or restoration of qualified historic buildings; and

(7) Provide a reasonable means of access to historic buildings for people with physical disabilities.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.02 Scope. The provisions of ch. Comm 70 are not retroactive.

(1) QUALIFIED BUILDINGS. Chapter Comm 70 applies solely to qualified historic buildings:

(a) Listed on, or nominated by the state historical society for listing on, the national register of historic places in Wisconsin;

(b) Included in a district which is listed on, or nominated by the state historical society for listing on, the national register of historic places in Wisconsin, and which has been determined by the state historical society to contribute to the historic significance of the district;

(c) Listed on a certified municipal register of historic property; or

(d) Included in a district which is listed on a certified municipal register of historic property, and which has been determined by the municipality to contribute to the historic significance of the district.

(2) NON-QUALIFIED BUILDINGS. Chapter Comm 70 does not apply to the following:

(a) Nursing homes as defined in s. 50.01 (3), Stats.;

(b) Hospitals as defined in s. 50.33 (1) (a) and (c), Stats.;

(c) Approved public or private treatment facilities for alcoholics as defined in s. 51.45 (2) (b) and (c), Stats.;

(d) Community–based residential facilities as defined in s. 101.127, Stats.;

(e) Chapter Comm 56 occupancies, except libraries, museums and art galleries;

(f) New additions to historic buildings;

(g) New buildings constructed in an historic district;

(h) Buildings that are reproduced; and

(i) Other buildings as specified in s. Comm 50.04.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.03 Election of code. (1) USE REMAINS UNCHANGED. (a) *Preserved, renovated, repaired or restored.* If a qualified historic building is preserved, renovated, repaired or restored to maintain the building in its original condition and the

use remains unchanged from the time of original construction, the owner may elect to be subject to one of the following codes:

1. Chapter Comm 70;
2. The code in effect at the time of original construction;
3. Chapters Comm 75 to 79, existing building code, for buildings erected prior to October 19, 1914; or
4. The prevailing code.

(b) *Altered or remodeled.* When a qualified historic building is altered or remodeled and that portion being altered or remodeled affects the structural strength, fire hazard, exits, required natural lighting or replacement of major equipment, the owner may elect to be subject to one of the following:

1. Chapter Comm 70; or
2. The prevailing code.

(2) USE CHANGES. When a qualified historic building is changed to a new use or converted from a use as an exempt building, as specified in s. Comm 50.04, to a public building or place of employment, the owner may elect to be subject to one of the following codes:

(a) Chapter Comm 70; or

(b) The prevailing code.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86; correction in (1) (a) 3. made under s. 13.93 (2m) (b) 7., Stats., Register, June, 1995, No. 474.

Comm 70.04 Impact of other codes on qualified historic buildings. (1) CODES AND ORDINANCES. Except as specified in sub. (2), no owner of a qualified historic building who elects to be subject to ch. Comm 70 may be required to comply with any requirement of the following:

(a) Any other building code administered by the department, if the building code concerns a matter addressed by ch. Comm 70;

(b) Any county or municipal building code, if the county or municipal building code concerns a matter addressed by ch. Comm 70; and

(c) Any other local ordinance or regulation, if the ordinance or regulation concerns a matter addressed by ch. Comm 70.

(2) LIMITATIONS. This chapter shall not be construed to affect local requirements relating to land use, zoning, fire districts or other similar requirements.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.05 Verification of a qualified historic building. If an owner elects to be subject to ch. Comm 70, the owner shall prove that the building is a qualified historic building [by] submitting a verification of historic building status form that is signed by the state historical preservation officer or an authorized municipal officer, verifying that the building is a qualified historic building.

Note: See Appendix for an example of the verification of historic status form.

Note: See Appendix for information on the certification of historic preservation ordinances.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.06 Application of historic building code. (1) QUALIFIED HISTORIC BUILDINGS. Except as specified in sub. (2), if an owner elects to be subject to ch. Comm 70, ch. Comm 70 shall be applied in its entirety.

(2) TOTALLY PRESERVED BUILDINGS USED AS HISTORICAL EXHIBITS. Any qualified historic building that is totally preserved and used solely as an historical exhibit shall comply with the requirements specified in subch. XI.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Subchapter II —Administration and Enforcement

Comm 70.07 Plan examination. (1) PLAN SUBMITTAL. Plans and specifications for all qualified historic buildings subject to ch. Comm 70 shall be submitted in accordance with the following:

(a) *Altered or remodeled.* If a qualified historic building is remodeled or altered and that portion being remodeled or altered affects the structural strength, fire hazard, exits of the building, required natural lighting, or replacement of major equipment, plans and specifications shall be submitted to the department or its authorized representative for examination and approval.

(b) *Change in use.* If a qualified historic building is changed to a new use, or converted from a use as a nonpublic building to a public building, plans and specifications showing compliance with this chapter shall be submitted to the department or its authorized representative as specified in s. Comm 50.21 for examination and approval before commencing work.

(2) BUILDINGS EXEMPT FROM DEPARTMENT PLAN SUBMITTAL. (a) *Preserved, renovated, repaired, or restored buildings.* Plans and specifications are not required to be submitted to the department for qualified historic buildings that are preserved, renovated, repaired or restored and the use remains unchanged from the time of original construction.

(b) *Totally preserved buildings used as historical exhibits.* If a qualified historic building complies with subch. XI for a totally preserved building used as an historical exhibit, plans and specifications are not required to be submitted to the department or its authorized representative for examination and approval.

(3) PLANS, SPECIFICATIONS AND DATA. If plans and specifications are required to be submitted, at least 4 complete sets of plans, which are clear, legible and permanent copies, and one copy of specifications and data shall be submitted for examination.

(a) *Preparation.* Plans and specifications shall be prepared as specified in ss. Comm 50.07 and 50.08. All plans shall contain the name of the owner and the address of the building. The signature and stamp or seal of the architect, engineer or designer who prepared the plans shall appear on the title sheet, in accordance with s. A–E 1.04 (4), Wis. Adm. Code, registration seals.

(b) *Building plans.* The building plans shall provide sufficient information to evaluate whether the building conforms to the requirements of this chapter and shall include the following.

1. Plot plan. The location of the building with respect to all property lines, adjoining streets, alleys and any other buildings on the same lot or property shall be indicated on the plot plan.

2. Floor plans. Floor plans shall be provided for each floor. The size and location of all rooms, doors, windows, firewalls, toilet facilities, structural features, exit passageways, exit lights, fire alarms, standpipes, stairs and other pertinent information shall be indicated. Schematic exit plans shall be provided indicating normal paths of egress.

3. Elevations. The elevations shall contain information on the exterior appearance of the building and indicate the location and size of doors, windows, roof shape, chimneys, exterior grade, footings and foundation walls, and include information about the exterior materials.

4. Sections and details. Sections and details shall include information to clarify the building design.

(c) *Footing and foundation.* If footing and foundation plans are required to be submitted, at least 4 complete sets of footing and foundation plans including plot plans, schematic floor plans showing exits, elevations and itemized structural loads shall be submitted to the department.

(d) *Heating, ventilating and air conditioning plans.* Heating, ventilating and air conditioning plans shall indicate the layout of the system, including location of equipment and size of all piping, duct work, dampers, fire dampers, chimneys, vents and controls. The quantity of outside air introduced to each zone, and the quantity of supply air and exhaust air for each room shall be listed on the plans. The type of equipment and capacity, including the input

and output, shall be indicated on the plans or equipment schedules, unless indicated in the specifications.

(e) *Specifications.* The specifications shall be properly identified with the drawings and describe the materials and the workmanship.

(4) STRUCTURAL REPORT. When plans and specifications are required to be submitted to the department or its authorized representatives a structural report as specified in subch. VI which identifies the structural condition of the building shall be submitted with the plans.

(5) APPROVAL APPLICATION FORMS. (a) *Plan approval application.* A plan approval application form SB–118 shall be submitted along with the plans and specifications as required in par. (3).

(b) *Verification form.* A verification of historic status form shall be submitted and signed by the state historic preservation officer or an authorized municipal official verifying that the building is a qualified historic building.

(c) *Building evaluation form.* When the building evaluation method is used, a completed building evaluation form as specified in s. Comm 70.23 shall be submitted.

Note: Copies of the department plan approval application form SB–118 are available from the Division of Safety and Buildings, P.O. Box 7162, Madison, Wisconsin 53707, telephone (608) 266–3151, TTY (608) 264–8777.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.08 Approvals. (1) DEPARTMENT APPROVAL. The department or its authorized representative shall review and make a determination on an application for plan review within 15 business days of receipt of the application and all forms, fees, plans and documents required to complete the review.

(a) *Plan approval.* 1. Conditional approval. If, upon examination, the department or its authorized representative determines that the plans and the application for approval substantially conform to the provisions of ch. Comm 70, a conditional approval, in writing, shall be granted. All non–code–complying conditions stated in the conditional approval shall be corrected before or during construction. A conditional approval issued by the department shall not be construed as an assumption of any responsibility for the design or construction of the building.

2. Denial of approval. If the department or its authorized representative determines that the plans or the application do not substantially conform to ch. Comm 70, the application for conditional approval shall be denied, in writing.

(b) *Footing and foundation approval.* Upon submission of 4 sets of footing and foundation plans, a plans approval application form, structural foundation calculations and a fee, the department or its authorized representative, may conditionally approve the footing and foundation plans to permit construction of the footings and foundations for a relocated qualified historic building. The department or its authorized representative shall review and make a determination on an application for footing and foundation approval within 15 business days of receipt of the application and all forms, fees, plans and documents required to complete the review.

(c) *Permission to start construction.* Upon submission of the plans approval application form, 4 complete sets of building plans and one copy of specifications, a written request by the owner to start construction, and a fee, the department or its authorized representative may issue a permission to start construction form for the footings and foundations for a relocated qualified historic building. The department shall review and make a determination on an application for permission to start construction within 3 business days of receipt of the application and all forms, fees, plans and documents required to complete the review.

Note: Copies of the department permit to start construction form SB–198 are available from the Division of Safety and Buildings, P.O. Box 7162, Madison, Wisconsin 53707, telephone (608) 266–3151, TTY (608) 264–8777.

Note: An approved permission to start construction does not constitute a building permit. Building permits may have to be obtained from the local authorities having jurisdiction in accordance with local regulation and ordinances.

Note: Section 66.036, Stats., prohibits issuance of building permits by counties, cities, towns or villages for structures requiring connection to a private domestic sewerage treatment and disposal system unless the system satisfies all applicable requirements and all necessary permits for such system have been obtained.

(2) MUNICIPAL OR FIRST CLASS CITY ENFORCEMENT. Any certified municipality or first class city complying with s. Comm 50.21 may administer and enforce ch. Comm 70.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.09 Evidence of plan approval. The architect, engineer, designer, builder, or owner shall keep at the building site one set of plans bearing the stamp of conditional approval and a copy of the specifications. The plans shall be open to inspection by the department or its authorized representative.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.10 Revocation of approval. The department may revoke any approval issued under the provisions of ch. Comm 70 for any false statements or misrepresentation of facts on which the approval was based.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.11 Expiration of plan approval. Plan approval by the department or its authorized representative shall expire one year after the date indicated on the approved plans if construction has not commenced within that year or if there has been a break in significant construction activity of more than one year.

Note: According to s. 66.05 (1) (a), Stats., the local governmental body or building inspector may order the razing of buildings or structures, or portions thereof, where there has been a cessation of normal construction for more than 2 years.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.12 Inspections. Inspections shall be conducted by the department or its authorized representative to ascertain whether the construction or installations conform to the conditionally approved plans, the conditional approval letter, and provisions of ch. Comm 70.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.13 Fees. (1) DEPARTMENT FEES. Fees for plan examination and inspection as specified in ch. Comm 2 and fees for petitions for variances, as specified in s. Comm 2.52 shall be submitted to the department with the appropriate completed application form and the plans and specifications.

(2) MUNICIPAL FEES. Municipalities providing plan examination and building inspection services may establish, by ordinance, fees to cover expenses for plan examination and inspection. Fees shall be submitted to the municipality in accordance with the municipal regulations and ordinances.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86; corrections in (1) made under s. 13.93 (2m) (b) 7., Stats., Register, June, 1995, No. 474.

Comm 70.14 Petition for variance. The department may grant a variance to any rule in ch. Comm 70 if the owner demonstrates that an alternative proposed by the owner meets the intent and purpose of the rule.

(1) SUBMITTAL REQUIREMENTS. The variance request shall be submitted on forms provided by the department supplemented by sufficient additional information as required by the department to make an analysis and determination, along with the appropriate processing fees.

(2) PETITION PROCESSING TIME. The department shall review and take an action on all petitions for qualified historic buildings within 10 business days of receipt of all calculations, documents and fees required to complete the review.

(3) CONDITIONS OF PETITION FOR VARIANCE. The department may impose specific conditions in a petition for variance to promote the protection of the health, safety or welfare of employes or the public. Violations of those conditions, under which the petition is granted, constitute a violation of the rules.

Note: Copies of the department petition for variance form SB–8 are available from the Division of Safety and Buildings, P.O. Box 7162, Madison, Wisconsin 53707, telephone (608) 266–3151, TTY (608) 264–8777.

Note: Chapter Comm 3, outlines the procedure for submitting petitions to the department and the department procedures for hearing petitions.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.15 Penalties. Penalties for violations of ch. Comm 70 shall be assessed in accordance with s. 101.02, Stats.

Note: Section 101.02 (13) (a), Stats., indicates penalties will be assessed against any employer, employe, owner or other person who fails or refuses to perform any duty lawfully enjoined, within the time prescribed by the department, for which no penalty has been specifically provided, or who fails, neglects or refuses to comply with any lawful order made by the department, or any judgment or decree made by any court in connection with ss. 101.01 to 101.25. For each such violation, failure or refusal, such employe, owner or other person must forfeit and pay into the state treasury a sum not less than $10 nor more than $100 for each violation.

Note: Section 101.02 (12), Stats., indicates that every day during which any person, persons, corporation or any officer, agent or employe thereof, fails to observe and comply with an order of the department constitutes a separate and distinct violation of such order.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Subchapter III —Definitions

Comm 70.17 Definitions. In this chapter:

(1) "Altered" or "alterations" means to modify a qualified historic building which affects the structural strength, fire hazard, access for the disabled, energy conservation, heating and ventilating, or electrical systems yet retains some original or restored architectural elements or features.

(2) "Authorized representative" means any first class city or certified municipality as specified in s. Comm 50.21.

(3) "Building" means any structure used or intended for supporting or sheltering any use or occupancy.

(4) "Certified municipal register of historic property" means a register of historic property which is part of an historic preservation ordinance promulgated by a city, village, town or county if the ordinance is certified by the state historical society under s. 44.22 (6) (j) and (9), Stats.

(5) "Change in use" means the process of adapting a building to accomplish a use other than that for which it was originally designed, but does not mean a change of use within an occupancy chapter.

Note: For example a factory (ch. Comm 54) being converted to multi–family housing (ch. Comm 57) or a one–and 2–family dwelling (exempt from department code regulations) converted to a gift shop (ch. Comm 54).

(6) "Department" means the department of commerce.

(7) "Historic fabric" means the original materials, and portions of the building still intact when exposed or as they appeared and were used in the past.

(8) "Historic aspect" means the particular features of the historic site, building or structure that gives it its historic significance.

(9) "National register of historic places in Wisconsin" means the places in Wisconsin that are listed on the national register of historic places maintained by the U.S. department of the interior.

(10) "Occupancy" means the purpose for which a building or structure is used or intended to be used as regulated in the prevailing code.

(11) "Occupancy chapter" means a classification of similar uses designated under a chapter heading in the prevailing code, including ch. Comm 54, factories, office and mercantile buildings, ch. Comm 55, theaters and assembly halls, ch. Comm 56, schools and other places of instruction, ch. Comm 57, residential occupancies, ch. Comm 59, hazardous occupancies, ch. Comm 60, child day care facilities, and ch. Comm 62, specialty occupancies.

(12) "Original material" means those features or elements of a qualified historic building or structure that have some historic significance.

(13) "Preserved" means maintaining a qualified historic building in its present condition or as originally constructed.

(14) "Prevailing code" means the most current edition of chs. Comm 50–64 building and heating, ventilating and air conditioning code.

(15) "Qualified historic building" means a building which is:

(a) Listed on, or nominated by the state historical society for listing on, the national register of historic places in Wisconsin;

(b) Included in a district which is listed on, or has been nominated by the state historical society for listing on, the national register of historic places in Wisconsin, and has been determined by the state historical society to contribute to the historic significance of the district;

(c) Listed on a certified municipal register of historic property; or

(d) Included in a district which is listed on a certified municipal register of historic property, and has been determined by the municipality to contribute to the historic significance of the district.

(16) "Reconstituted" means a qualified historic building that is reassembled piece–by–piece on the same site or new site.

(17) "Relocated" means any qualified historic building or a portion of a qualified historic building that will be moved to a new location.

(18) "Remodeled" means to substantially change the structure of a qualified historic building, including load–bearing and non–loading walls or partitions or both; change the location of exits; or change the toilet facilities; but shall not include maintenance, redecoration, reroofing or alteration of mechanical or electrical systems.

(19) "Renovated" means to make sound again any structure by cleanup and replacement of deteriorated detail or structure.

(20) "Repaired" means to replace, cleanup, rebuild or renew any portion of a qualified historic building for the purpose of its maintenance.

(21) "Reproduced" means the process of rebuilding an entirely non–existent structure to its original appearance through archival and archeological investigation.

(22) "Restored" means the process of accurately recovering, by the removal of later work or the replacement of missing earlier work, as it appeared at a particular period of time.

(23) "Structural deterioration" means a decline in the original strength of a structural element caused by fire, water, wind, snow, insects, age or excessive loading, which result in cracks, distortions, deflections, misalignments, abrasion, erosion or corrosion to the structure.

(24) "Test–of–time" means a structure that has over a period of time withstood the combined service loads and environmental stresses imposed upon it and shows no sign of serious deterioration.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86; correction in (6) made under s. 13.93 (2m) (b) 6., Stats., Register, January, 1998, No. 505.

Subchapter IV —Building Evaluation Method

Comm 70.20 Scope. This subchapter provides an alternative method for determining code compliance for a qualified historic building being remodeled, altered or changed in use.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.21 Building evaluation method. The building evaluation method established in this subchapter provides a method for evaluating the degree of life safety of a qualified historic building by comparing 17 building safety parameters with the requirements of the prevailing code.

(1) LIFE SAFETY. The degree of life safety is measured in terms of:

(a) *Fire safety.* The category of fire safety includes the building safety parameters affecting the structural fire resistance,

detection, alarm and extinguishing features of a qualified historic building.

(b) *Means of egress.* The category of means of egress includes those building safety parameters of a qualified historic building affecting safe evacuation.

(c) *General safety.* The category of general safety includes all the safety building parameters under fire safety and means of egress.

(2) SEVENTEEN BUILDING PARAMETERS. A qualified historic building shall be evaluated using the 17 building safety parameters indicated in Table 70.21.

Table 70.21

1. Number of Stories	9. Smoke detection
2. Building Area	10. Fire Alarms
3. Building Setback	11. Smoke Control
4. Attic Compartmentalization	12. Exit Capacity
5. Firestopping	13. Dead ends
6. Mixed Occupancies	14. Maximum Travel
7. Vertical Openings	15. Emergency Lighting
8. HVAC Systems	16. Elevator Control
	17. Sprinklers

(3) DETERMINING NUMERICAL VALUE. Each building safety parameter shall be evaluated using the criteria specified under that particular building safety parameter [Comm 70.22 (1) – (17)] in order to determine the degree of life safety provided by the qualified historic building and the numerical value assigned for the degree of life safety.

(a) Numerical values may not be interpolated and shall be listed according to value and positive (+) or negative (–) sign.

(b) Numerical values may not be assigned to those spaces on the summary sheet identified with NA.

(c) Where a building parameter does not apply, a value of zero (0) shall be assigned.

(4) BUILDING EVALUATION FORM. After the numerical value has been determined for each building safety parameter the same numerical value shall be entered on the Building Evaluation form in s. Comm 70.23 under each of the life safety categories titled, "Fire Safety", "Means of Egress" and "General Safety" for each building parameter.

(5) TOTAL BUILDING SAFETY SCORE. After each building parameter of the building is evaluated, the numerical values shall be algebraically summed or totaled according to value and sign for each column on the evaluation form in s. Comm 70.23 for fire safety, means of egress and general safety to determine a total building safety score.

Note: (+5) + (–5) = 0; (+5) + (–5) + (+5) =+5.

(a) If the total building safety score under each column is equal to or greater than zero, the qualified historic building is considered to be a code complying building and may be used for the proposed use.

(b) If the total building safety score of any one of the columns related to fire safety, means of egress or general safety is less than zero, additional safety measures shall be provided to bring the total numerical score of that column to a value which is equal to or greater than zero.

(6) FILING OF BUILDING EVALUATION FORM. A copy of the building evaluation form shall be submitted with the plans and specifications.

(a) *Single use.* One building evaluation form shall be completed for a qualified historic building containing a single use or a similar use within the same occupancy classification or where an occupancy separation is not provided.

(b) *Mixed uses.* One building evaluation form for each use shall be completed for a qualified historic building containing uses not within the same occupancy classifications, separated by an occupancy separation.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.22 Building evaluation procedures. When the building evaluation method is used, the process specified in this section shall be used in its entirety. The building evaluation method analyzes a qualified historic building in accordance with the building safety parameters specified in this section and compares them against the prevailing code to determine a numerical value of safety provided in the qualified historic building.

(1) NUMBER OF STORIES. (a) 1. The class of construction of the qualified historic building shall be determined by comparing the actual building elements to those specified in s. Comm 51.03. The class of construction shall be based on that which most closely represents one of the 8 classes of construction as described in s. Comm 51.03.

2. Buildings with different classes of construction shall be separated with a class of construction separation specified in the prevailing code unless the lowest class of construction is used as the basis for the evaluation.

(b) The allowable number of stories for the class of construction of the qualified historic building shall be determined in accordance with the prevailing code: ss. Comm 51.02, 51.03 including Table 51.03–A, and the class of construction or height requirements or both as specified in the applicable occupancy chapters.

(c) A single numerical value from Table 70.22–1 shall be determined and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, number of stories, for fire safety, means of egress and general safety.

TABLE 70.22–2

Safety Parameter/Number of Stories	Numerical Value (per story)
Each story above the maximum number of stories allowed	–5
Complies with prevailing code	0
Each story below the maximum number of stories	+5 (maximum value, +10)

(2) BUILDING AREA. (a) The allowable building area of a qualified historic building shall be determined using the allowable area requirements for the class of construction and use as specified in the prevailing code: ss. Comm 51.03 including Table 51.03–A, and the allowable area requirements specified in the applicable occupancy chapter.

(b) If the qualified historic building has more stories than permitted by the prevailing code, the maximum number of stories allowed for that class of construction in the prevailing code shall be used to determine the maximum allowable area requirements for the building. (See example for determining the area.)

(c) When the entire building is protected by an approved automatic sprinkler system complying with the prevailing code, the allowable building area may be increased as specified in the prevailing code.

(d) Where an assembly hall is located in a building with other uses, the building shall comply with the class of construction requirements as specified in s. Comm 55.02 which are based on the maximum capacities of the assembly hall.

(e) A single numerical value shall be determined from Table 70.22–2 and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, building area, for fire safety, means of egress and general safety.

EXAMPLE FOR DETERMINING AREA

Existing Building Occupancy: Office building, ch. Comm 54
Class of Construction: Type 5B, exterior masonry, unprotected
Number of Stories: 6 stories
Street Frontage: 3 streets
Floor Area: 12,000 sq. ft. per floor
Prevailing code requirements:
Type 5B, exterior masonry, unprotected
maximum number of stories: 3 stories
maximum floor area: 16,000 sq. ft. per floor

$\frac{12,000}{16,000} = 67\%$ of allowable

TABLE 70.22–2

Building Area	Numerical Value
More than 150% of the allowed area	–5
131% – 150% of allowed	–4
121% – 130% of allowed	–3
111% – 120% of allowed	–2
90% to 110% ofallowed area, or where code does not have area limitations	0
80% – 89% of allowed	+2
70% – 79% of allowed	+3
50% – 69% of allowed	+4
Less than 50% of the area allowed	+5

(3) BUILDING SETBACKS. (a) The building setback shall be compared with those specified in the class of construction requirements in the prevailing code: s. Comm 51.03 including Tables 51.03–A and 51.03–B and the class of construction requirements in the applicable occupancy chapter.

(b) A single numerical value shall be determined from Table 70.22–3 using the worst case condition and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, building setback, for fire safety and general safety.

TABLE 70.22–3

Building Setbacks	Numerical Value
Closer than allowed under the prevailing code	–2
Complies with prevailing code	0
Greater than the prevailing code	+2

(4) ATTIC COMPARTMENTALIZATION. (a) The attic area of a qualified historic building shall be evaluated against the compartmentalization standards specified in s. Comm 51.02 (19) of the prevailing code.

(b) A single numerical value shall be determined from Table 70.22–4 and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, attic compartmentalization, for fire safety and general safety.

(c) If the total attic area is less than 3,200 square feet, the numerical value is 0.

(d) All existing or proposed building features used or considered under this subsection shall be shown or indicated on the plans submitted for review. It will be assumed by the department that features not shown or indicated do not exist and will not be provided, and no credit under the subsection may be taken.

TABLE 70.22–4

Attic Compartmentalization	Numerical Value
Attic compartmentalized into areas greater than 3200 square feet	–3
Complies with prevailing code (3200 square feet)	0
Attic compartmentalized into areas less than 2000 square feet	+3

(5) FIRESTOPPING. (a) The firestopping characteristics of a qualified historic building shall be evaluated in accordance with the firestopping requirements specified in s. Comm 53.63 of the prevailing code.

(b) If the existing wall material is removed and the wall cavity is exposed, firestopping shall be provided in accordance with s. Comm 53.63.

(c) A single numerical value shall be determined from Table 70.22–5 for the entire building based on the worst case condition and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, firestopping, for fire safety and general safety.

TABLE 70.22–5

Firestopping	Numerical Value
No fire stopping or No verification of firestopping	–5
Firestopping provided at basement and attic levels and wherever accessible	–3
Complies with prevailing code (or verified)	0

(6) MIXED OCCUPANCIES. (a) Occupancy separations in a qualified historic building shall be evaluated as required under the occupancy chapters of the prevailing code: s. Comm 51.08 and the occupancy separation requirements in the applicable occupancy chapters.

(b) A single numerical value shall be determined from Table 70.22–6 based on the worst case condition and the numerical value and its sign, either positive or negative, shall be entered on [the] evaluation form in s. Comm 70.23 under the safety parameter, mixed occupancies, for fire safety and general safety.

TABLE 70.22–6

Occupancy Separations	Numerical Value
No separation provided, but required	–5
Provided, but 2–hours less than required	–4
Provided, but 1–hour less than required	–2
Complies with prevailing code for fire resistive ratings or no separation isrequired[1]	0
Provided and 1 or more hours greater than required	+2

[1] Where a 3 hour is required and a 4 hour is provided, the value shall be 0.

(7) VERTICAL OPENINGS. (a) The fire–resistive rating of enclosures of stairway exits, hoistways, escalator openings and other shafts within a qualified historic building or openings between 2 or more floors shall be evaluated in accordance with the prevailing code: s. Comm 51.02 (11) and the enclosure requirements from the applicable occupancy requirements.

(b) Atriums more than 3 levels shall not be considered in the evaluation of vertical openings, but shall comply with s. Comm 70.26.

(c) Where assembly halls are located in buildings with other uses, the required exits shall comply with the prevailing code.

(d) A single numerical value shall be determined in accordance with Table 70.22–7 based on the worst case condition and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, vertical openings, for fire safety, means of egress and general safety.

TABLE 70.22–7

Vertical Openings	Numerical Value (per shaft or opening)
No enclosure	–3
Enclosure with no rating	–2
Enclosure provided but 1–hour below the required protection level	–1
Complies with prevailing code	0
1–hour required, but 2–hour provided	+1

(8) HEATING, VENTILATING, AND AIR CONDITIONING. (a) The number of floors in a qualified historic building served by an individual heating, ventilating, and air conditioning (HVAC) system shall be evaluated in accordance with the prevailing code.

(b) A single numerical value shall be determined from Table 70.22–8 and the numerical value and its sign, either positive or negative, shall be entered on [the] evaluation form in s. Comm 70.23 under the safety parameter, HVAC, for fire safety, means of egress and general safety.

TABLE 70.22–8

HVAC Systems	Numerical Value
Greater than 5–floor levels served by undampered duct system:combustibles in air plenums, or corridors used as air plenums.	–5
3 to 5–floor levels served by undampered duct system	–2
2–floor levels served by undampered duct system	–1
Complies with prevailing code or provided with fire dampers	0
Multi–level buildings having 1–floor level HVAC system or central system with no ducts serving other floor levels	+5

(9) SMOKE DETECTION. (a) A qualified historic building shall be evaluated for the building's ability to detect smoke from a fire, based on the location and operation of smoke detectors that are in addition to the smoke detectors required by the applicable occupancy chapters of the prevailing code.

(b) A single numerical value shall be determined from Table 70.22–9 and the numerical value and its sign, either positive or negative, shall be entered on [the] evaluation form in s. Comm 70.23 under the safety parameter, smoke detection, for fire safety, means of egress and general safety.

TABLE 70.22–9

Smoke Detection	Numerical Value
Complies with prevailing code	0
Elevator lobby only and not required by chs. Comm 50–64	+1
HVAC return only and not required by chs. Comm 50–64	+2
HVAC return and elevator lobby and not required by chs. Comm 50–64	+3
All corridors, in addition to those required by the code; including elevator lobbies [1]	+4
Total space with interconnection of smoke detectors and building fire alarmsystem and not required by chs. Comm 50–64	+5

[1]If required detectors meet the requirements for corridor protection, enter 0.

(10) FIRE ALARMS. (a) The fire alarm system shall be evaluated in accordance with the prevailing code: s. Comm 51.24 and the fire alarm requirements in the applicable occupancy chapter.

(b) A single numerical value shall be determined from Table 70.22–10 and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, fire alarms, for fire safety, means of egress and general safety.

TABLE 70.22–10

Fire Alarms	Numerical Value
Manual fire alarm system required, but not provided	–5
Manual fire alarm system required and provided, but does not comply with prevailing code	–2
Complies with the prevailing code	0
Manual fire alarm system provided but not required[1]	+1
Manual fire alarm and voice alarm or manual fire alarm with public address system provided, but not required[2]	+3
Central control station[3,4]	+4
Central control station and interconnected to a remote control station which is permanently monitored[3,4]	+5

[1]If a numerical value of (+5) is taken under (9) smoke detection, the numerical value for this section is 0.
[2]Voice alarm and public address system shall be activated from a location which is occupied by an employe during all periods of building occupancy.
[3]The central control station must comply with s. Comm 52.01 (2) (f).
[4]Fire department may require systems to be interconnected with the fire department.

(11) SMOKE CONTROL. (a) The ability to control the movement of smoke from a fire by natural or mechanical venting, exhaust or pressurization systems in a qualified historic building shall be evaluated in accordance with Table 70.22–11 for the entire building based on the worst case condition.

(b) A single numerical value shall be determined from Table 70.22–11 and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, smoke control, for fire safety, means of egress and general safety.

(c) If a building is 2 stories or less in height, the numerical value is 0.

TABLE 70.22–11

Smoke Control	Numerical Value
Operable windows, that are operable without special keys or tools, are provided throughout the entire building, but not required	+2
Automatic smoke vents provided throughout entire building, but not required	+3
One smoke proof stair enclosure provided and building has operable windows, but neither required	+5
Pressurized stairs (all stairs) provided, but not required	+7
Engineered smoke control and removal system provided that covers the entire building, but not required	+10

(12) EXIT CAPACITY. (a) The means of egress by number of exits, location of exits, occupant load and capacity of exits in a qualified historic building shall be evaluated in accordance with the prevailing code: ss. Comm 51.15, 51.151, and the exiting requirements specified in the applicable occupancy chapters.

(b) The minimum number of exits shall be provided as specified in the prevailing code for the applicable occupancy chapter.

(c) A single numerical value shall be determined from Table 70.22–12 and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, exit capacity, for means of egress and general safety.

(d) If exiting differs on various floor levels, the worst case floor shall be evaluated.

TABLE 70.22–12

Exit Capacity	Number Value (per exit)
Complies with prevailing code	0
Horizontal exits are provided in addition to the required exits[1]	+2
Exits to grade or enclosed stairs exceed the minimum number of exits[2]	+3
Eliminate a fire escape exit and provide a code complying enclosed stairwayexit serving 3 or more levels	+5

[1]No more than one–half the exits may be horizontal exits.
[2]Exits shall be at least 20 feet apart.

(13) DEAD ENDS. (a) The length of the travel path in which the building occupants are confined to a single direction of egress shall be evaluated in accordance with Table 70.22–13.

(b) Dead ends greater than 30 ft. are not permitted.

(c) The creation of new dead end corridors is prohibited.

(d) A single numerical value shall be determined from Table 70.22–13 and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, dead ends, for means of egress and general safety.

TABLE 70.22–13

Dead Ends	Numerical Value (per dead end)
Dead ends more than 20 feet	–5
Complies with prevailing code or dead ends less than 20 feet	0

(14) MAXIMUM TRAVEL DISTANCE TO AN EXIT. (a) The length of travel to a required exit in a qualified historic building shall be evaluated in accordance with the prevailing code: ss. Comm 54.02 and 57.03 depending on the occupancy chapter.

(b) When the entire building is protected by an approved automatic sprinkler system, complying with the prevailing code, the travel distances may be increased as specified in the prevailing code.

(c) Travel distances that exceed 25% above the required limitations are not permitted.

(d) A single numerical value shall be determined from Table 70.22–14 and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, maximum travel distance, for means of egress and general safety.

TABLE 70.22–14

Maximum Travel Distance	Numerical Value
111% – 125% of limit allowed	–5
90% – 110% of prevailing code limit	0
50% – 89% of limit allowed[1]	+3
Less than 50% of limit allowed[1]	+5

[1]For residential occupancies no credit may be taken for reduced exit distance.

(15) EMERGENCY POWER. (a) The availability of emergency power for emergency lighting in a qualified historic building shall be evaluated in accordance with the prevailing code and ch. Comm 16.

(b) A single numerical value shall be determined from Table 70.22–15 and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, emergency power, for means of egress and general safety.

TABLE 70.22–15

Emergency Power	Numerical Value
Emergency power required, but not provided	–5
Complies with prevailing code	0
Emergency power provided, but not required[1]	+2

[1]Does not apply to buildings 2 stories or less in height.

(16) ELEVATOR CONTROL. (a) The elevator equipment and controls that can be used by the fire department in a qualified historic building to rescue building occupants from upper floors during a fire when installed shall be evaluated in accordance with ch. Comm 18.

(b) A single numerical value shall be determined from Table 70.22–16 and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, elevator control, for fire safety, means of egress and general safety.

TABLE 70.22–16

Elevator Control	Numerical Value
No elevators in buildings 3 stories or more in height	–3
No elevator in buildings 2 stories or less in height	0
Elevator with fire department control in buildings 3 stories or less in height	+1
Elevator with automatic recall in buildings 3 stories or more in height	+4
Elevator with fire department control and automatic recall in buildings 3 stories or more in height	+5

(17) SPRINKLERS. (a) The sprinkler system provided in a qualified historic building shall be evaluated in accordance with the prevailing code: ss. Comm 52.01 and 52.015 and the applicable occupancy chapters.

(b) A single numerical value shall be determined from Table 70.22–17 and the numerical value and its sign, either positive or negative, shall be entered on the evaluation form in s. Comm 70.23 under the safety parameter, sprinklers, for fire safety, means of egress and general safety.

(c) If the building area evaluation was based on sprinkler protection as allowed by sub. (2) (c), the numerical value under this section is 0.

TABLE 70.22–17

Sprinklers	Numerical Value
System required but not provided[1]	–5
Existing sprinkler system is required but does not meet prevailing code[2]	–1
Sprinkler system is not required and not provided	0
Sprinkler system required and provided in accordance with the prevailing code	0
Existing sprinkler system is not required and does not meet prevailing code[2]	+1
Sprinklers provided in unseparated hazardous areas and exit passageways, but not required	+3
Partial sprinkler system is provided throughout at least 75% of the building, but not required	+5
If sprinkler system is required, and regular sprinkler heads are replaced with quick response heads	+5
Complete sprinkler system provided throughout entire building, but not required	+7
Complete sprinkler system complying with NFPA 13 for quick response heads is provided throughout the entire building, but not required[3]	+10

[1]If –5 was entered under sub. (2), numerical value is 0.
[2]Does not apply to partial systems.
[3]If –5 was entered under sub. (2), numerical value is +5.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86; correction in (16) (a) made under s. 13.93 (2m) (b) 7., Stats., Register, June, 1995, No. 474.

Comm 70.23 Building evaluation form. The numerical values determined in s. Comm 70.22 shall be entered in Table 70.23.

TABLE 70.23

Safety Parameters	Fire Safety	Means of Egress	General Safety	Comments
1. Number of Stories				
2. Building Area				
3. Building Setback		NA		
4. Atttic Compartmentalization		NA		
5. Firestopping		NA		
6. Mixed Occupancies		NA		
7. Vertical Openings				
8. HVAC Systems				
9. Smoke Dectection				
10. Fire Alarms				
11. Smoke Control	NA			
12. Exit Capacity	NA			
13. Dead Ends	NA			
14. Maximum Travel Distance	NA			
15. Emergency Power	NA			
16. Elevator Control				
17. Sprinklers				
TOTAL SAFETY SCORE				

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Subchapter V —Miscellaneous Building Requirements

Comm 70.25 Purpose. The purpose of this subchapter is to provide alternative building standards for qualified historic buildings.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.26 Atriums. Where the use of a qualified historic building is changed to a new use and an atrium exists, the atrium may remain subject to the following:

(1) THREE LEVELS OR LESS. Except as provided in sub. (3), atriums in a qualified historic building serving 3 levels or less may remain as constructed; however, the atrium will be considered an unenclosed shaft under s. Comm 70.22 (7).

(2) MORE THAN THREE LEVELS. Atriums in a qualified historic buildings serving more than 3 levels, but not exceeding 8 levels, may be permitted subject to the requirements in the prevailing code or the alternate atrium standards specified in sub. (3).

(3) ALTERNATE ATRIUM STANDARDS. (a) *Separations.* The atrium opening shall be separated at each floor by non–rated partitions or glazing.

(b) *Doors.* Doors shall be provided in the openings separating the atrium from the floor.

1. Existing doors may be non–rated.

2. New doors shall be of a solid wood core type or particleboard core type door and may have glazing. Door frames may be of wood.

3. All doors shall be automatic self–closing in accordance with the prevailing code. The hold–open device shall be activated by a product of combustion detector which responds to products of combustion other than heat.

(c) *Smoke detection.* A smoke detection system, interconnected to a building fire alarm system, shall be provided on each floor at the atrium perimeter.

(d) *Smoke removal.* A mechanical smoke removal system shall be provided at the top of the atrium to exhaust smoke to the outside.

1. The smoke removal system shall be activated by activation of 2 or more of the detectors required by par. (c).

2. The smoke removal system shall exhaust 6 air changes per hour based on the volume of the atrium and spaces open to the atrium but not less than 40,000 CFM.

3. The smoke removal system shall be subject to s. Comm 52.07 (11) and (12).

(e) *Exiting.* At least one exit shall be provided from each space on each floor level that is independent of any exit located in or through the atrium.

(4) NEW ATRIUMS. Atriums constructed on or after January 1, 1986, shall comply with the requirement of the prevailing code.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.27 Roof coverings. Existing roof coverings not in conformance with the ratings specified in Table 51.03–A of the prevailing code may be allowed to remain on the building. Repairs may be made up to 50% of the entire roof surface with materials that match the existing roof coverings. If more than 50% of the entire roof surface needs to be repaired, the roof covering shall conform to the requirements of the prevailing code. Where wood shingles are utilized to preserve the historic features, the shingles shall be of a fire treated type and of a class C rating.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.28 Illuminated exit signs. Exit signs shall be provided in accordance with s. Comm 51.15 (5).

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.29 Fire escapes. (1) PERMITTED USES. Existing fire escapes constructed in accordance with s. Comm 51.20 may continue to be used as an exit unless the building use is changed to a use where fire escapes are not permitted.

(2) HEIGHT ABOVE GRADE. Existing fire escapes are restricted as follows:

(a) *Building approved prior to 1914.* Buildings having fire escapes constructed prior to September 14, 1914, shall be permitted to remain as built.

(b) *Buildings approved on or after September 15, 1914, but prior to 1942.* Fire escapes used on buildings constructed after September 15, 1914, but prior to January 1, 1942 shall not exceed 60 feet in height, except that fireproof buildings may have fire escapes up to 90 feet in height.

(c) *Buildings approved on or after January 1, 1942.* Fire escapes used on buildings constructed after January 1, 1942 may not exceed 55 feet in height or 5 stories.

(3) EXITS TO FIRE ESCAPES. Every fire escape shall be accessible from a public passageway, or shall be directly accessible from each occupied room. Exits to fire escapes shall be standard exit doors as specified in s. Comm 51.15, except that doors to "A" fire escapes may be reduced to not less than 2 feet 6 inches wide. Access to a required fire escape platform may be provided with an interior stairs complying with s. Comm 51.16.

(4) STRUCTURAL ANALYSIS. All existing fire escapes intended to be used as a required exit shall be inspected, structurally analyzed or load tested prior to use. A written report from the engineer or architect stating the results of the inspection and structural analysis or load test shall be submitted to the department. The report shall document the physical condition of the fire escape, condition of the attachment of the fire escape to the exterior wall and capacity of the fire escape to support imposed loads. The report shall outline what corrective action is necessary, if any, and shall be submitted to the department.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.30 Stairway requirements. Except for the following, existing required exit stairways shall comply with the prevailing code:

(1) WIDTH. Minimum stairway width shall be at least 3 feet – 0 inches.

(2) RISER AND TREADS. (a) *Ten or less people.* Existing stairways serving 10 or less people may have riser and tread dimensions not to exceed a 45° angle with the horizontal.

(b) *More than 10 people.* All required exit stairways shall have a uniform rise of not more than 73/4 inches and a uniform tread not less than 91/2 inches, measuring from riser to riser and tread to tread.

(3) HANDRAILS. Except for the following, handrails shall comply with the prevailing code.

(a) *Extensions.* The 12–inch handrail extension as specified in s. Comm 51.16 (4) at the bottom and top of stairways does not apply to existing stairways.

(b) *Openings below top rail.* Existing handrails protecting the open sides of stairways and ramps may have an opening no larger than 12 inches between the rails.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.31 Guardrails. Except for the following, guardrails shall comply with the prevailing code.

(1) HEIGHT. If the height of a guardrail is less than 36 inches, an additional rail shall be provided to the top of the rail to increase the overall height to 42 inches.

(2) OPENINGS BELOW TOP RAIL. Additional rails provided in accordance with sub. (1) shall be installed such that the distance

between the 2 top rails do not allow the passage of an object with a diameter larger than 12 inches.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.32 Doors. Exit door size and swing shall comply with the prevailing code. Double doors may be used with a door leaf less than 32 inches in width provided the total door width measures at least 36 inches.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.33 Sanitary facilities. Sanitary facilities shall be provided in accordance with the prevailing code.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Subchapter VI —Alternate Structural Requirements

Comm 70.35 Purpose. The purpose of this subchapter is to ensure that qualified historic buildings are structurally sound, while allowing the significant historic fabric of the building to remain.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.36 Scope. All qualified historic buildings shall meet the loading requirements specified in this subchapter.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.37 Application. (1) ALTERNATE STRUCTURAL REQUIREMENTS. Except as provided in sub. (2), this subchapter applies to historic buildings being:

(a) Reconstituted;

(b) Repaired;

(c) Remodeled; or

(d) Changed in use.

(2) NON-HISTORIC ADDITIONS AND ALTERATIONS. (a) *Structurally separated.* New additions which are structurally separated from the existing qualified historic structure shall comply with the loading requirements of ch. Comm 53.

(b) *Affect existing structure.* New additions or alterations which impose vertical or lateral loads on an existing qualified historic building are not permitted unless the supporting structure of the qualified historic building is capable of supporting the imposed load or unless the structure is augmented to meet the additional imposed loads.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.38 Structural report. (1) WHEN REQUIRED. A structural report shall be prepared on historic structures in accordance with the following:

(a) *Less than 25%.* When a qualified historic building is remodeled or changed in use which affects less than 25% of the total area of the building, a structural analysis shall be performed on that portion being remodeled.

(b) *25% or more.* When a qualified historic building is remodeled or changed in use which affects 25% or more of the total area of the building, a complete structural analysis shall be performed on the entire building.

(c) *Reconstituted building.* Prior to reconstituting any vacant qualified historic building, a structural analysis of the entire building shall be performed.

(d) *Repairs and replacements.* If any part of an historic building is repaired or replaced, a structural analysis shall be performed on that portion being repaired or replaced showing that the repair or replacement equals or exceeds the structural capability of the part being repaired or replaced.

(2) VISUAL EXAMINATION. A visual examination shall be made by an engineer or architect to determine if the building structure has cracks, distortions, sagging, excessive deflections, significant misalignment, signs of leakage and peeling of finishes caused by fire, wind, water or snow.

(3) ANALYSIS. A structural analysis shall be prepared by a Wisconsin registered engineer or architect which describes the structural condition of the building.

(a) The analysis shall demonstrate that the building structure can support the imposed live loads.

(b) An analysis shall be made of the floors to determine the actual load carrying capacity.

(c) An analysis shall be made of the roof to determine the actual load carrying capacity or, the architect or engineer shall submit a statement, signed and sealed that the roof structure has stood the test of time [Comm 70.39 (2)].

(d) An analysis shall be made to determine if the structural frame can carry all combined loads.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.39 Alternative standards. The alternative standards for loading and materials may be used in lieu of those in the prevailing code.

(1) FLOOR LIVE LOADS. (a) *Reductions.* Except for storage areas and assembly occupancies, the following floor live loads may be used in all occupancies in lieu of augmenting the structure to accommodate the required loading specified in the prevailing code.

1. The live load specified in the prevailing code may be reduced by 15% for flexure if 3 or more wood structural members are spaced less than 24 inches on center and are joined by a load distributing element. This live load reduction may not be applied to the supports or if the original design used repetitive allowable stresses.

2. The reductions specified in the prevailing code for large tributary areas which comply with s. Comm 53.11 (3) may be used.

3. The live load specified in the prevailing code may be reduced by 10% if the existing structure provides a 2–hour fire–resistive rating. This reduction may be applied to steel and concrete systems only.

4. The permitted reductions specified in subds. 1.–3. are not to be used cumulatively.

(b) *Posting.* If the actual live load capability is less than the required live load specified in the prevailing code, the actual live capability load shall be conspicuously posted and no greater load may be imposed upon the building.

(2) TEST OF TIME STANDARD. The test of time standard may be applied in lieu of meeting the design load requirements for roof dead load, live load and wind load specified in the prevailing code where no change of loading will occur, providing:

(a) The historic building has been determined to support the imposed floor loads; and

(b) The building has stood for more than 20 years with no visible signs of deterioration.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.40 Use of archaic materials. This section establishes alternative standards that may be used to evaluate the performance of archaic materials and assemblies in qualified historic buildings.

(1) ALLOWABLE STRESSES AND CONSTRUCTION REQUIREMENTS. Allowable stresses and construction requirements for archaic materials may be assigned on the basis of comparison with similar conventional codified materials or tests or both.

(a) *Archaic codes.* Whenever possible, allowable stresses and construction requirements shall be assigned on the basis of the code in effect at the time of construction.

(b) The allowable stresses may be determined as follows:

1. Wood. Unless wood is laboratory tested, the allowable stress shall not exceed the lowest allowable stress for that particular species and grade. If the grade and species can not be deter-

mined, the allowable stress for the lowest grade and species may be used.

2. Masonry. Allowable stresses for masonry may be determined by laboratory results.

3. Steel. The allowable stresses for steel may be determined using earlier editions of steel design manuals for the period when the steel was fabricated.

4. Concrete. The allowable stresses for concrete may be determined using earlier editions of concrete design manuals.

(2) STRUCTURAL CHANGES. Structural changes to buildings that are restored, altered or repaired may be made with the same materials of which the existing building or structure was constructed in order to maintain historical integrity.

(3) FIRE RESISTANT PROPERTIES. (a) The fire resistance of an archaic building element may be determined from tables on fire ratings of archaic materials and assemblies recognized by the department and in accordance with the following conditions:

1. The building element shall be constructed of materials with the same dimensions and properties as indicated in the tables;

2. The thickness shall be at least equal to, or greater than that specified in the tables;

3. All penetrations in the building element, or assembly, for electrical, plumbing and heating, ventilating and air conditioning systems shall be packed with noncombustible cementitious materials and so fixed that the packing material will not fall out when it loses its water of hydration; and

4. Any effect of age, wear and tear shall be repaired so that the building element is sound, and the original thickness of all components is maintained.

Note: The department recognizes fire ratings published in the Rehabilitation Guidelines 1980, volume 8, Guidelines on Fire Ratings of Archaic Materials and Assemblies prepared by the National Institute of Building Sciences for the U.S. Department of Housing and Urban Development.

(b) Fire resistance ratings for a building element may be determined by:

1. An actual test by an approved testing laboratory as specified in prevailing code;

2. Typical examples as listed in the prevailing code; or

3. An approved calculation method that utilizes the principles and theories of heat flow, mechanical properties, deflection, capacity and as outlined in the prevailing code.

(c) *New materials.* The fire resistance of any new assembly or materials shall conform to the provisions of the prevailing code.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Subchapter VII —Alternate Accessibility Requirements

Comm 70.41 Purpose. The purpose of this subchapter is to ensure that qualified historic buildings provide access for people with physical disabilities, while maintaining the significant historic fabric or historic aspects of such buildings.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.42 Accessibility requirements. All qualified historic buildings being altered or remodeled, added to or changed in use shall comply with the requirements of ch. Comm 69.21 and ADAAG 4.1.7.

History: Cr. Register, January, 1998, No. 505, eff. 2–1–98.

Comm 70.43 Alternate access requirements. History: Cr. Register, September, 1986, No. 369, eff. 10–1–86; r. Register, January, 1998, No. 505, eff. 2–1–98

Comm 70.44 Access to totally preserved buildings used as exhibits. History: Cr. Register, September, 1986, No. 369, eff. 10–1–86; r. Register, January, 1998, No. 505, eff. 2–1–98.

Subchapter VIII —Alternate Energy Conservation Requirements

Comm 70.46 Purpose. The purpose of this subchapter is to provide alternative standards for qualified historic buildings for conserving energy, while maintaining the significant historic fabric or historic aspects of such buildings.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.47 Scope. The prevailing code for energy conservation applies to all qualified historic buildings, except as provided in ss. Comm 70.48 to 70.51.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.48 Application. (1) APPLICABLE BUILDINGS. Except as provided in sub. (2), this subchapter shall apply to:

(a) Qualified historic buildings undergoing remodeling;

(b) Qualified historic buildings which undergo any change of occupancy or use which would increase the energy consumption; or

(c) Replacement of heating and cooling equipment and lighting systems within qualified historic buildings.

(2) EXEMPT BUILDINGS AND STRUCTURES. The following buildings and structures are exempt from the provisions of the prevailing energy conservation code as well as the alternative energy conservation requirements of this subchapter:

(a) Totally preserved buildings used as historical exhibits; and

(b) Seasonal use buildings.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.49 Definitions. In this subchapter:

(1) "Accessible" means capable of being reached without undesired removal or alteration of any part or parts of the permanent structure, finish material or paved sidewalk or driveway which would cause damage to historic fabric. Cavities under floors, or unfinished attic areas are considered accessible.

(2) "Thermal resistance (R)" means a measure of the ability of materials to retard the transfer of heat. The R–value is the reciprocal of a heat transfer coefficient or thermal transmittance, expressed by U; R=1/U.

Note: The higher R–value of a material, the more difficult it is for heat to flow through the material.

(3) "Thermal transmittance (U)" means the coefficient of heat transmission expressed in units of Btu per square foot per degree F per hour. It is the time rate of heat transfer. The U–value applies to combinations of different materials used in series along the path of heat transfer and also to single materials that comprise a building section, and includes cavity air spaces and surface air films on both sides.

Note: The lower the U–value of a material, the more difficult it is for heat to flow through the material.

(4) "Thermal performance" means the design heat loss, excluding infiltration and ventilation, through above–grade gross walls and roof and attic assemblies facing the conditioned interior.

(5) "Vapor barrier" means a material, including vapor barrier paint with a vapor transmission rate less than 1.00 perm.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.51 Alternative energy conservation requirements. Except as specified in subs. (3) and (4), the alternative energy conservation requirements as specified in this subchapter may be applied to a qualified historic building where strict compliance with the prevailing code would destroy the historic fabric of the building.

(1) INFILTRATION. (a) *Windows and doors.* 1. All exterior windows and doors shall be gasketed or weatherstripped.

2. If the existing windows are replaced with factory manufactured windows, the windows shall be double glazed or equipped with interior or exterior storm windows.

(b) *Chimney flues.* Flues which are no longer in use shall be closed off and sealed against infiltration.

(c) *Exterior openings.* The following openings in the exterior building envelope shall be caulked, gasketed or otherwise sealed:

1. Exterior joints around window and door frames;

2. At penetrations of utility services through walls, floors and roofs; and

3. Between the foundation and box sill.

(2) THERMAL PERFORMANCE OF THE EXTERIOR ENVELOPE. Historic buildings shall meet the minimum thermal performance values specified in the prevailing code shall or the prescriptive energy conservation measures specified in this subsection.

(a) *Attics.* Where accessible, insulation shall be installed in the attic to a level of R38. Minimum ventilation shall be provided above the ceiling or attic insulation. The free area of ventilation shall be at least of the horizontal area. Vapor barriers shall be installed on the warm side of all insulation materials present in the attic. Access panels or doors to attics shall be insulated to a level of R5 if vertical or to a level of R19 if horizontal.

1. When adding insulation to existing attic insulation, do not use a material with an integral vapor barrier or install a vapor barrier between layers of insulation material; otherwise, condensation problems may result.

2. If cellulose insulation materials are used, the cellulose should be fire–proofed with chemicals other than sulfate compounds. Sulfate compounds may form sulfuric acid when in contact with moisture which could cause or accelerate structural deterioration.

(b) *Exterior walls.* All accessible exterior wall cavities shall be insulated to a level of R11 or completely filled with insulation. Where accessible, a vapor barrier shall be installed on the warm side of the insulation, facing the conditioned space. Where masonry walls are insulated from the interior, the walls shall be insulated to at least R10.

(c) *Box sills.* Where accessible, insulation shall be installed in box sills to a level of R19.

(e) *Doors.* Doors which are not of the original material shall be insulated, double glazed or equipped with a storm door. Where no vestibule exists, exterior doors which are not of the original material or are not replicas designed to be compatible with the historic aspects of the structure shall be insulated, double glazed or equipped with a storm door.

(f) *Floors over crawl spaces.* If accessible, insulation with an R–value of 11 or greater shall be installed in floors of crawl spaces.

(g) *Moisture control in crawl spaces.* Minimum ventilation shall be provided in unheated crawl spaces with insulated ceilings. The area of ventilation shall be at least 1/300 of the floor space. The area of ventilation shall be distributed equally to provide cross–ventilation. Where accessible, a vapor barrier shall be applied to cover the exposed earth.

(3) HEATING AND COOLING EQUIPMENT. The replacement of heating and cooling equipment which serves qualified historic buildings shall comply with the provisions of the prevailing code.

(a) *Alternative air handling duct insulation.* All ducts, plenums and similar enclosures serving qualified historic buildings shall be insulated as specified in the prevailing code.

(b) *Alternative pipe insulation.* All piping within qualified historic buildings shall be thermally insulated to the levels specified in the prevailing code where they may be made accessible.

(4) WATER HEATING. The replacement of water heating equipment in qualified historic buildings shall comply with the provisions of the prevailing code for energy conservation.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Subchapter IX —Alternate Mechanical Requirements

Comm 70.55 Purpose. The purpose of this subchapter is to ensure that qualified historic buildings are properly heated, ventilated and air conditioned, while allowing the significant historic fabric of the building to remain.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.56 Application. (1) ALTERNATE MECHANICAL REQUIREMENTS. Except for historic exhibits and seasonal use buildings, used during the period of May 15 through September 15, all qualified historic buildings shall be provided with a heating system.

(a) The building shall be equipped with heating equipment that equals or exceeds the transmission losses and ventilation of infiltration losses, whichever are greater. The heat loss shall be based on the design criteria for outside temperatures and interior design temperatures for the specific use specified in the prevailing code.

(b) If the existing heating equipment output equals or exceeds the heat loss, the heating equipment may be used provided all the safety devices are in working order or the defective safety devices are replaced.

(c) If room sizes are increased and the heating equipment serving the room has sufficient capacity to meet the increased heat loss, the equipment may be used provided:

1. The equipment has sufficient capacity to meet the new heat loss and the equipment can operate safely at the increased temperature or pressure; and

2. Safety devices are repaired or replaced to operate at the increased temperature or pressure.

(d) If room sizes are increased and the heating equipment serving the room does not have sufficient capacity to meet the increased heat loss:

1. Additional equipment shall be added to meet the new heat loss; or

2. New heating equipment shall be provided to offset the additional heat loss.

(e) If rooms are reduced in size such that the resulting heat loss is less than that provided to the space, the existing equipment may be altered by reducing the heat to that space if reducing the heat does not affect the safety devices regulating the system.

(f) Any alteration or remodeling of existing heating equipment or systems shall conform to the prevailing code for that portion being remodeled or altered. Unless replaced with a like kind, the replacement shall conform to the prevailing code.

(2) LIGHT AND VENTILATION. Except for historic exhibits, all qualified historic buildings shall be provided with natural light and ventilation as specified in the prevailing code.

(3) AIR CONDITIONING. Existing air conditioning systems may be allowed to remain. Any alteration made to an existing air conditioning system shall conform to the prevailing code.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Subchapter X —Alternate Electrical Requirements

Comm 70.58 Purpose. The purpose of this subchapter is to ensure that qualified historic buildings are properly wired while allowing the significant historic fabric of the building to remain.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.59 Application. (1) QUALIFIED HISTORIC BUILDINGS. Except for historic buildings complying with sub. (2), all other qualified historic buildings shall be serviced with electricity as follows:

(a) *Change of use.* If a qualified historic building is changed in use, a load calculation of the building shall be performed for the proposed use. If the load calculation exceeds the actual service provided, the service shall be upgraded to meet the new load.

(b) *Reconstituted.* If a qualified historic building is without electrical service and is going to be reconnected to electrical service, the existing wiring shall be inspected at the service panels, outlets, switches and where exposed to determine the physical condition of the wire and equipment.

(c) *Alterations and repairs.* Any alterations, repair or replacement to an existing conductor, outlet, switch and equipment in a qualified historic building shall be made in accordance with the prevailing electrical code for that portion being altered, repaired or replaced.

(d) *Existing building.* Existing qualified historic buildings may use the existing electrical system without upgrading the electrical system to the prevailing code.

(2) HISTORIC EXHIBITS. Qualified historic buildings used as historic exhibits do not require electrical service.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Subchapter XI —Totally Preserved Buildings Used As Historical Exhibits

Comm 70.62 Scope. This subchapter establishes alternative standards for a qualified historic building that is open to the public and used solely as an historic exhibit. Repairs may be made without conformity to the prevailing code to restore the building to the original condition.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.63 Historic exhibits. (1) Exempt. Except as specified in sub. (2), a qualified historic building used as an historic exhibit is exempt from complying with the requirements of the prevailing code or other sections of ch. Comm 70.

(2) Minimum safety requirements. The following minimum safety requirements shall be complied with:

(a) The historic building is open to the public only under the supervision of a tour guide;

(b) The historic building is not lived in, slept in or worked in except for the purpose of demonstrating to the public how people lived in a particular era;

(c) No smoking is allowed in the building;

(d) No open flame equipment is installed in the building, other than fireplaces and original equipment;

(e) Fire extinguishers are provided, but may be located in a nonconspicuous location on the premise;

(f) At least one smoke detector is provided for each 1,200 square feet of area with a minimum of one detector per floor level. Where electricity is available, the smoke detectors shall be connected to the electrical power. Where no electrical power is available, the smoke detector may be of a battery type. Smoke detectors shall be tested weekly;

(g) Access for the disabled is provided in accordance with subch. VII;

(h) The capacity of the floor system shall be determined by a registered architect or engineer and any changes that are necessary shall be made prior to the building being open to the public;

(i) Historic buildings provided with only one exit shall be restricted to a total capacity of 12 persons of which not more than 6 persons may be located above the first floor at any one time;

(j) Signs shall be posted in the building identifying and warning of stairs and headroom clearance that do not conform to the prevailing code; and

(k) Exit signs shall be provided in accordance with the prevailing code in buildings occupied prior to $^1/_2$ hour before sun rise and $^1/_2$ hour after sun set and in all areas not provided with natural lighting.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Comm 70.64 Sanitary requirements. Toilet facilities shall be made available in accordance with the prevailing code. The facilities may be located on the site and serve more than one historic exhibit.

History: Cr. Register, September, 1986, No. 369, eff. 10–1–86.

Chapter Comm 70

APPENDIX

The material contained in the appendix is for clarification purposes only. The notes and illustrations are numbered to correspond to the number of the rule as it appears in the text of the code. All references to "copies of these forms are available from the department" means the following:

Safety and Buildings Division
P.O. Box 7162
Madison, WI 53707

A 70.05 Verification of a Qualified Historic Building. The following form must be completed by the Preservation officer from the State Historical Society or a certified municipality.

WISCONSIN HISTORIC BUILDING CODE
VERIFICATION OF HISTORIC STATUS

INSTRUCTIONS: In order to take advantage of the historic building code, your building must be verified as being a "qualified historic building." To obtain verification, you must complete this form and mail it to either the State Historical Society, or to an authorized representative of your municipality, as indicated below.

Please include with your application, photographs of the outside of the building. The photos should illustrate the building from the most visible sides.

HISTORIC STATUS
OF PROPERTY (CHECK ONE)

( ) Property is individually listed in the National Register of Historic Places
( ) Property has been nominated to the National Register, but is not yet listed.
( ) Property is located within a National Register of historic district.

BUILDING CODE VERIFICATION
Historic Preservation Division
MAIL FORM TO:
State Historical Society
816 State Street
Madison, Wisconsin 53706

( ) Property is individually listed in a certified municipal register of historic property.
( ) Property is located within an historic district listed in a certified municipal register.

MAIL FORM TO:
The authorized official in your municipality. Contact your local government for more information.

BUILDING AND OWNERSHIP DATA

NAME AND ADDRESS OF OWNER: _____

_____

_____

Telephone number of owner during day
(___)_____

ADDRESS OF HISTORIC BUILDING;_____

_____

NAME OF HISTORIC DISTRICT (IF APPLICABLE):_____
HISTORIC NAME OF BUILDING (IF KNOWN):_____

FOR STATE HISTORICAL SOCIETY USE ONLY

( ) I hereby verify that the above–mentioned property is a qualified historic building for purposes of the Wisconsin Historic Building Code.

DATE SIGNATURE: STATE HISTORIC PRESERVATION OFFICER

FOR CERTIFIED MUNICIPAL USE ONLY

( ) I hereby verify that the above–mentioned property is a qualified historic building for purposes of the Wisconsin Historic Building Code.

DATE SIGNATURE: AUTHORIZED MUNICIPAL OFFICIAL

A 70.05 Verification of Qualified Historic Building.

The following is information on the process for certification of Historic Preservation ordinances which will be handled through the State Historical Society.

Certification of Historic Preservation Ordinances
for the
Wisconsin Historic Building Code

1. *Background.* In accordance with Wisconsin Statutes 101.121 and 44.22 (9), a municipality (city, village, town or county) may request the State Historical Society of Wisconsin to certify its local historic preservation ordinance in order to establish a "certified municipal register of historic property" to qualify locally designated historic buildings for the Wisconsin Historic Building Code.

The purpose of the Wisconsin Historic Building Code, which has been developed by the Department of Commerce, is to facilitate the preservation or restoration of designated historic buildings through the provision of alternative building standards. Owners of qualified historic buildings are permitted to elect to be subject to the Historic Building code in lieu of any other state or municipal building codes.

For purposes of the Historic Building Code, a "qualified historic building" is defined as an historic building which:

1. Is listed in, or nominated by the State Historical Society for listing in, the National Register of Historic Places in Wisconsin;

2. Is included in a district which is listed in, or has been nominated by the State Historical Society for listing in, the National Register of Historic Places in Wisconsin, and has been determined by the State Historical Society to contribute to the historical significance of the district;

3. Is listed in a certified municipal register of historic property; or

4. Is included in a district which is listed in a certified municipal register of historic property, and has been determined by the municipality to contribute to the historic significance of the district.

2. *Certified municipal register of historic property: certification requirements.* A "certified municipal register of historic property" is a local register of historic properties which have been designated under an historic preservation ordinance promulgated by a city, village, town or county if the ordinance is certified by the State Historical Society of Wisconsin.

The State Historical Society will certify a municipal historic preservation ordinance for purposes of the Historic Building Code if the ordinance does all of the following:

1. Contains criteria for the designation, in a municipal register, of historic structures and historic districts which are substantially similar to the criteria for inclusion in the National Register of Historic Places in Wisconsin;

2. Provides a procedure for the designation of historic structures or historic districts which includes, at a minimum, a nomination process, public notice of nominations and an opportunity for written and oral public comment on nominations;

3. Provides for the exercise of municipal control by ordinance, to achieve the purpose of preserving and rehabilitating historic structures and historic districts;

4. Creates a municipal historic preservation commission.

Information on historic preservation ordinances, including the publication, *Historic Preservation Law in Wisconsin,* which contains a model ordinance, is available from the State Historical Society of Wisconsin.

3. *To request certification.* To request certification of a municipal historic preservation ordinance, the chief elected local official is required to send to the State Historic Preservation Officer, State Historical Society of Wisconsin, 816 State Street, Madison, WI 53706, the following materials:

1. A letter signed by the chief elected local official requesting certification of the municipal historic preservation ordinance for the purposes of the Historic Building Code;

2. A copy of the historic preservation ordinance, including the date the ordinance was enacted;

3. A list of locally designated historic properties and districts, including addresses, presently on the municipal register of historic property; and

4. The name, address and telephone number of the local official or person authorized to certify the eligibility of local qualified historic buildings for purposes of the Historic Building Code.

The State Historic Preservation Officer will respond to requests for certification within 30 days of receipt.

4. *Further Information.* Questions concerning the certification of local historic preservation ordinances or nominations of properties to the National Register of Historic Places should be directed tot he Historic Preservation Division, State Historical Society of Wisconsin, 816 State Street, Madison, WI 53706, telephone (608) 262–1339.

Note: *The Certified Local Government program in Wisconsin.* The Certified Local Government (CLG) program in Wisconsin is a separate program from the certification of municipal ordinances for the Historic Building Code. However, the two programs are related and can be applied for simultaneously. The CLG program is designed to foster a closer working relationship among local, state and federal historic preservation programs. Wisconsin municipalities that have enacted historic preservation ordinances and have established local historic preservation programs may apply for CLG status in accordance with the National Historic Preservation Amendments Act of 2180 and the "Procedures for the Certification of Local Governments in Wisconsin."

CLG's, in addition to being certified for the Historic Building Code, are eligible to apply for special CLG matching grants to carry out certain local historic preservation activities to improve their preservation programs and to maintain their qualification as CLGs.

The CLG program in Wisconsin and the requirements for CLG certification are described in a booklet entitled "Procedures for the Certification of Local Governments in Wisconsin," which is available from the State Historical Society of Wisconsin.

SUBMITTAL AND DESIGN SUPPLEMENT

SUBMITTAL AND DESIGN SUPPLEMENT

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Consistency/Clarification Requests

The Division of Safety & Buildings has developed several new features to provide input in the code development process and maintain a consistency in application to the interim pending code changes.

A **Code Clarification Team** made up of state building inspectors, plan reviewers, and consultation staff will survey code users, research code history, variances, and model codes, and formulate code change recommendations and interim application to clarify "gray areas" of the code for uniform application.

A **Request for Clarification** citing the code section, your view points on how the code should be applied, and supporting data can be made to the team via the Division of Safety & Buildings, P.O. Box 7969, Madison, Wisconsin 53707). The team will prioritize the submitted items by evaluating the importance to life safety, frequency of occurrence, effect on general public lifestyle/convenience, cost impact, impact on other government agencies, impact on the building industry, and administrative resources. The team will then evaluate the request and formulate a code change proposal to clarify the code. Pending a formal code change, the team will issue an informational notice, code commentary update, and/or request a formal code interpretation depending on the degree of clarification needed. Pending clarification team action on requests, uniformity in application of the code to frequently occurring "gray areas" will be achieved by issuing a consistency memo which describes how reviewers and inspectors should handle an item until a final decision is made. All of the above will be published in the *Wisconsin Building Codes Report.*

CONSISTENCY/CLARIFICATION REQUEST

Code Section Number/Numbers:_____

Question/Subject Matter/Explanation of Problem:

Proposed Clarification Solution:

Supporting Data (Statistics, Model Code Provisions, Articles, etc.):

Plan #_____

REQUEST FOR RECONSIDERATION

Items 1 - 8 to be completed by submitter.

1. Name of Owner	2. Building or Project	3. Agent, Architect or Engineer
Company	Tenant Name, if any	Street and Number
Street and Number	Location, Street and Number	City State Zip
City State Zip	City County	Telephone Number
Telephone Number	Project Number	Name of Contact Person

Instructions: This procedure is to be utilized as A LAST RESORT APPEAL to the Bureau director after discussion with the plan reviewer/inspector and appropriate supervisors has not resolved the issue. This form is to be used to resolve conflicts with application of the code not as a substitute for a variance application. This form should be filed within 30 days of the initial determination.

4. The rule for which reconsideration is requested is:

_____

5. The position of the design professional/plan reviewer on the application of this rule is:

_____

6. The supporting information provided to justify this position is:

_____

7. An acceptable resolution to the application of this rule is:

_____

8. Design prof./plan reviewer signature: _____

Date: _____

To be completed by employee or agent making initial determination.

9. Rationale or Basis of Decision:

Initial Decision By: _____ Date: _____

Items 10 and 11 to be completed by Staff.

10. Staff Recommendation:

Recommended By: _____ Date: _____

11. Bureau Director Determination:

Determined By: _____ Date: _____
Bureau Director

HOW TO FILL OUT THE RECONSIDERATION FORM

I. The submitter completes Numbers 1 through 8 and forwards the form to:

DIVISION OF SAFETY & BUILDINGS
P 0 BOX 7969
MADISON WI 53707

1. Owners: name, address, and phone number.

2. Building occupancy, location, county, and project number.

3. Designer's: name, address, and phone number.

4. Identify the cited code section you wish to have reconsidered by this Bureau. A copy of the cited section must be included.

5. Provide an explanation of what you—as the design professional—believe is the appropriate application of the code.

6. Provide documentation to support your position. Documentation may include:

   How model codes (UBC, BOCA, NFPA, etc.) deal with subject; opinions from the local building or fire official; past projects with similar situations; and any other information that will aid in the evaluation of your reconsideration request.

7. Identify what you feel is an acceptable resolution to the situation (accept design or construction as is, propose alternative method of compliance, etc.).

8. The registered design professional or supervising professional must sign the request when the building is over 50,000 cubic feet or less if there is no design professional.

II. The Division of Safety & Buildings employee (plan reviewer or building inspector) or agent (certified municipality plan reviewer or building inspector) completes Item 9 to indicate the basis of the initial determination or decision.

III. The completed form (Items 1 through 9) is evaluated by the Division. Consultation and a recommendation made (Item 10) to the Bureau Director who will make a final determination (Item 11).

INFORMATIONAL BULLETIN - SHOPPING MALLS

To address common questions regarding code requirements for shopping malls, the following bulletin has been prepared.

INTRODUCTION. The method used to determine proper application of the code should follow these general steps with the detailed procedures following:

1. Establish the capacity of the tenant space. (COMM 54.05/55.06)

    a. If the tenant space capacity is over 100 occupants and used for dining, entertainment, or recreation, the tenant space will be classified as an assembly hall and the requirements of Chapter COMM 55 must be complied with.

    b. If the tenant space is used for dining, entertainment, or recreation by 100 persons or less, the requirements of Chapter 54 will apply.

2. Determine the location and number of exits required from the space. (COMM 51.151, 54.02, 55.07)

3. Determine the type and hardware for exits required for exit door. (COMM 51.15, 54.06, 55.10)

4. Determine the location and number of sanitary fixtures required. (COMM 54.12 or 55.32)

5. Establish if the required occupancy separation is provided if tenant space is an assembly hall. (COMM 55.05)

COMM 54.03 NUMBER AND LOCATION OF TENANT SPACE EXITS.
COMM 55.07

1. From Chapter 54 Spaces

    a. One exit with two directions of travel at the exit door is required from tenant spaces with a capacity of 25 persons or less.

    b. Two or more exits are required from tenant space with capacities of more than 25 persons and from restaurants or lounges seating more than 25 persons.

    c. All parts of tenant spaces falling under the scope of COMM 54 shall be within 150 feet of an exit described in COMM 54.02; 200 feet if the entire mall is sprinklered.

d. Exits from tenant spaces shall be distributed to provide the best possible egress. The distance between the exits shall be at least equal to one half the diagonal measurement of the tenant space.

e. If both required exits must be located in the store front to the mall, the following apply:

(1) The exits must be at least 20 feet apart and store fixture layouts must be submitted showing access to both exits.

(2) The depth of the tenant space shall not exceed the mall frontage width, and store fixture layouts must be submitted showing access to the exits.

2. From Chapter 55 Spaces

a. One of the required means of egress from the tenant space may be through the public mall, provided the travel distance from the tenant space to an exit is not more than the width of the public mall corridor. If the exit from the mall corridor is a rated exit corridor or stair enclosure, the rating shall be in accordance with Table COMM 51.03-A, based on the Class of Construction of the shopping center.

b. Except for the exit allowed by number 2.a. of this section, exiting from the tenant space shall be via direct exits to the exterior of the shopping center, or via rated exit corridors or stair enclosures leading to the exterior in accordance with COMM 51.18.

c. Exit corridors or stair enclosures, passing through other than Chapter 55 occupancies, shall be 3-hour rated as required by COMM 55.05 and COMM 51.08, except for the single exit passageway allowed by number 2.a. of this section.

d. Exit corridors or stair enclosures staying within COMM 55 occupancies shall be rated in accordance with the Class of Construction requirements of Table 51.03-A.

e. Doors from other tenant spaces may open directly into rated exit corridors (not stair enclosures) serving assembly halls with a capacity of 300 persons or less if properly rated in accordance with COMM 51.047 and if the doors do not swing into the corridor so as to obstruct the required COMM 55.32 corridor width—3' 8" minimum or as required by COMM 51.15 (6). This may require recessing of the doors.

3. Mall Exiting. Exiting from the building is based on 120 square feet per person of gross mall area excluding the anchor stores.

COMM 54.05 CAPACITY.
COMM 55.06

1. Retail/Wholesale

a. 60 square feet per person of gross area

b. 45 square feet per person of retail area if stockrooms and toilets are shown

c. 30 square feet per person of open, usable retail area if a complete fixture layout is shown on the plans to be approved

2. Restaurants/Lounges

a. 10 square feet per person of patron area if no seating layout is provided

b. Seating layout if it is shown on the plans to be approved

3. Games/Arcades

a. 10 square feet per person of gross area

b. If game layout is shown on the plans to be approved

(1) Pool area - 40 square feet per person of the gross area

(2) Other table games - 4 persons per table

(3) Video, pinball, etc. - 2 persons per game if games are shown

COMM 54.06 EXIT DOORS (from tenant spaces).
COMM 55.10

1. From Chapter 54 Tenant Spaces

a. Exit doors shall comply with COMM 51.15 except as provided by COMM 54.06 and as provided in this informational bulletin.

b. Rolling, sliding and overhead grilles and/or doors may be installed between an COMM 54 tenant space and the mall, and may be considered a means of egress if the following is provided:

(1) Exit hardware in accordance with COMM 51.15 (3) is installed.

(2) Door or gate is counterbalanced such that it can be opened by a force not exceeding 12 pounds, or, if the door/gate is electrically operated, the door is supplied by an emergency power source capable of opening the door/gate.

(3) The door/gate is maintained in a fully open position during business hours.

(4) The additional security device permitted by COMM 51.15 (3)(b) 1. is not engaged when the store is occupied by employees.

(5) Manual, chain hoist operators are not acceptable.

2. From Chapter 55 Tenant Spaces

a. Exit doors shall comply with COMM 51.15 and COMM 55.10, except as provided in this informational bulletin.

b. Rolling, sliding or overhead fire doors may be installed at the mall entrance to the tenant space if that opening is not a required exit from the space, the width of that opening is not considered when determining exit widths per COMM 51.15 (6), and prov ided standard exit doors are located adjacent to the rolling, sliding, or overhead fire door serving as an exit from the tenant space.

c. Rolling, sliding and overhead doors or grilles (not fire doors equipped with self-closing devices) may be installed at the mall entrance to the tenant space, and may be considered an exit access door, if the following conditions are satisfied:

(1) Exit hardware, in accordance with COMM 51.15 (3), shall be installed on the door.

(2) The door or grille shall be counterbalanced such that it can be opened by a force not exceeding 12 pounds, or, if the door/grille is electrically operated, the operator shall be supplied an emergency power source capable of opening the door/grille.

(3) The door or grille shall be maintained in a fully opened position during business hours.

(4) Overhead grilles may be lowered to 6' 4" and sliding doors closed such as to provide a minimum 36" wide opening at the close of business hours when residual patrons are still present in the space.

(5) The door/grille may be completely closed after the last patron has left the space.

(6) An additional security device, as permitted by COMM 51.15 (3)(b) 1., may be installed when the last employee leaves the space.

(7) Manual, chain hoist operators are not acceptable.

COMM 54.12 SANITARY FACILITIES.
COMM 55.32

1. General. For shopping mall sanitary facilities, use the following information:

   a. Strip malls and general mercantile stores:

      (1) All spaces shall have a minimum of one toilet.

      (2) The number of facilities for each occupancy shall be determine by COMM 54.12 based on 60 square feet per person of gross floor area.

   b. Code Section COMM 54.12 (l)(b) provides the option of locating sanitary facilities for the public either in the stores or in the common mall area. Typically, in larger shopping centers, the common area is used for other purposes such as arts and crafts, exhibits, and other community events. The mall space in these shopping centers is considered to be occupied in addition to the tenant spaces. The minimum sanitary facilities provided for the common area should be based on 120 square feet per person using the gross area of the mall common space, not tenant spaces.

   c. In stores or tenant spaces which accommodate not more than 10 employees and 25 patrons, only one toilet is required. When applying Table 54.12-A, the number of employees and patrons are added to determine the sanitary facility requirements. Capacity shall be calculated using 60 square feet per person or gross floor area. Where an existing store is subdivided to provide two or more tenant spaces, these new areas may be accepted without toilet rooms if the occupants have access to the existing sanitary facilities by way of public corridors.

   d. Restaurants located in shopping centers are required to provide toilet rooms to accommodate occupants, as specified in s. COMM 54.12 (2)(a), and may not use the public mall facilities to satisfy this requirement. The Department of Health and Social Services Code for Restaurants, in Section HSS 196.04 (9), requires public toilet rooms to be under the supervision of the restaurant operator and to be located so that it is not necessary for patrons to pass through areas used for food required to have the toilet rooms located contiguous to the dining or serving areas. (Contiguous is defined as touching, joining, or in contact with.)

      (1) We will allow toilet rooms provided for restaurants accommodating 100 or less occupants to be located in the mall if they are adjacent to the dining area and are part of the restaurant lease space. Directions to the toilet rooms must be conspicuously posted in the dining area.

      (2) A small restaurant which sells food for carry-out and also provides seating for 15 or less customers may provide one toilet room to accommodate both sexes. This toilet rooms would have to be barrier-free. A toilet room for public use is not required for a food service operation with no seating for customers.

2. Food Courts. The following sanitary facilities requirements apply to enclosed mall shopping centers utilizing a concept usually called a food court. A food court is an area

in the mall of the shopping center, furnished with tables and chairs, and surrounded by fast-food and beverage outlets. Customers go to the individual fast-food or beverage tenants, make a purchase, and consume purchased items in the mall seating area. Typically, the individual tenant has no seating facilities within the tenant lease space and the dining area is under the control of the mall operator. The requirements for toilet facilities for the food court area is unclear in the code.

The department will require toilet facilities for food court areas in accordance with the following:

a. Men's and women's toilet rooms shall be provided with access directly from the seating area.

b. The number of toilet fixtures shall be determined on the basis of Table 55.32, Taverns and Restaurants, based on 10 square feet per person in the seating area or a reasonable seating layout shown on the plans.

c. Food and beverage tenants which provide seating within the tenant space must provide toilets within the space in accordance with COMM 54.12 (1)(d) and (2)(a), or COMM 55.32.

d. Food and beverage tenants which do not provide for seating within the tenant space must provide employee toilet rooms in accordance with COMM 54.12 (1)(b).

The intent of this interpretation is to consider the seating area of the food court as an individual tavern/restaurant and to require adequate toilet facilities for the occupants of that area, immediately adjacent and convenient to that area.

CONTRACT DISPUTES

Please refer dispute questions to one of the following agencies:

Landlord-Tenant Disputes

Department of Agriculture, Trade and Consumer Protection	800-422-7128
Community Advocates (Handles landlord/tenant problems in Milwaukee)	414-449-4777
Building Owners and Managers Association of Milwaukee 231 West Wisconsin Avenue, Suite 403 Milwaukee, WI 53203	414-278-7557
Metropolitan Builders Association Home Owners Warranty Council 6511 Bluemound Road Milwaukee, WI 53213	414-258-9850

Owner-Builder Contract Disputes

Department of Agriculture, Trade and Consumer Protection	800-422-7128

PROPERTY IDENTIFICATION NUMBERS

The Division of Safety & Buildings application form SB-118 has been revised to coincide with the July 1, 1992, fee revisions. One of the major changes to this form is found in the request for a property identification number in Box 2. Inclusion of this number is the first step in providing better service to you by allowing us to index files, permi ts, plan review, variances, etc., by a number unique to the property where the project is constructed rather than trying to follow a series of ownership changes, individual or company name changes, misspellings, etc.

These property identification numbers may be obtained from the following members of the Wisconsin Real Property Listers Association or possibly from local tax-assessing agencies.

County	Phone Number	Address
Adams	(608) 339-4205	P.O. Box 14 Friendship, WI 53934
Ashland	(715) 682-7003	201 W. 2nd St. Ashland, WI 54806
Barron	(715) 537-6313	330 E. LaSalle Ave., Rm. 233 Barron, WI 54812
Bayfield	(715) 373-6132	117 E. 5th St. Washburn, WI 54891
Brown	(920) 448-4496	111 N. Jefferson St., P.O. Box 1600 Green Bay, WI 54305
Buffalo	(608) 685-6215	Buffalo County Courthouse Alma, WI 54610
Burnett	(715) 349-2551	County Government Center, 5410 CTH "K", #126, Siren, WI 54872
Calumet	(920) 849-2361	206 Court St. Chilton, WI 53014
Chippewa	(715) 723-1831 (Ext. 222)	711 N. Bridge St., P.O. Box 550 Chippewa Falls, WI 54729
Clark	(715) 743-5155	517 Court St., County Courthouse, Rm. 302 Neillsville, WI 54456
Columbia	(608) 742-2191	Assessment of Property Dept., Adm. Bldg., Box 198 (Ext. 284) Portage, WI 53901
Crawford	(608) 326-0221	220 N. Beaumont Rd. Prairie du Chien, WI 53821
Dane	(608) 266-4120	City-County Bldg., Rm. 116, Land Reg. & Rec. Dept. Madison, WI 53709

Dodge	(920) 386-3771	127 E. Oak St. Juneau, WI 53039
Door	(920) 746-2287	Courthouse, P.O. Box 670 Sturgeon Bay, WI 54235
Douglas	(715) 394-0386	County Clerk's Office, 1313 Belknap St. Superior, WI 54880
Dunn	(715) 232-1401	800 Wilson Ave. Menomonie, WI 54751
Eau Claire	(715) 839-2984	Planning & Devel. Dept., Rm. A180, 731 Oxford Ave. Eau Claire, WI 54703
Florence	(715) 528-3204	P.O. Box 410 Florence, WI 54121
Fond du Lac	(920) 929-3027	City-County Govt. Center, 160 S. Macy St. Fond du Lac, WI 54935
Forest	(715) 478-3216	Courthouse Crandon, WI 54520
Grant	(608) 723-2675	130 W. Maple St. Lancaster, WI 53813
Green	(608) 328-9435	Treasurer's Office, Courthouse Monroe, WI 53566
Green Lake	(920) 294-4015	Courthouse, 492 Hill St. Green Lake, WI 54941-9999
Iowa	(608) 935-5628	Courthouse, 222 N. Iowa St. Dodgeville, WI 53533
Iron	(715) 561-2883	Courthouse Hurley, WI 54534
Jackson	(715) 284-0203	Courthouse, 307 Main St. Black River Falls, WI 54615
Jefferson	(414) 674-7146 (Ext. 124)	Courthouse, Rm. 109, 320 S. Main St. Jefferson, WI 53549
Juneau	(608) 847-9312	Real Property Description Office Courthouse, Rm. 110, 220 E. State St. Mauston, WI 53948-1348
Kenosha	(414) 653-6807	912 56th St. Kenosha, WI 53140
Kewaunee	(920) 388-4410 (Ext. 118)	Courthouse, 613 Dodge St. Kewaunee, WI 54216
La Crosse	(608) 785-9637	Courthouse, Rm. 105, 400 N. 4th St. La Crosse, WI 54601
Lafayette	(608) 776-4862	Courthouse, 626 Main St., P.O. Box 170 Darlington, WI 53530
Langlade	(715) 627-6208	800 Clermont St., Rm. 203 Antigo, WI 54409

Lincoln	(715) 536-0335	1110 E. Main St. Merrill, WI 54452
Manitowoc	(920) 683-4019	1010 S. 8th St. Manitowoc, WI 54220
Marathon	(715) 847-5295	Courthouse, 500 Forest St. Wausau, WI 54401
Marinette	(715) 732-7546	1926 Hall Ave., P.O. Box 320 Marinette, WI 54143-0320
Marquette	(608) 297-9148	77 W. Park St., P.O. Box 186 Montello, WI 53949
Menominee	(715) 799-3311	P.O. Box 428 Keshena, WI 54135
Milwaukee	(414) 278-3159	Tax Comm. Office, Rm. 507, 200 E. Wells St. Milwaukee, WI 53202
Monroe	(608) 269-8730	Court St. Sparta, WI 54656
Oconto	(920) 834-5322 (Ext. 301)	300 Washington St. Oconto, WI 54153
Oneida	(715) 369-6148	P.O. Box 400 Rhinelander, WI 54501
Outagamie	(920) 832-5071	410 S. Walnut St. Appleton, WI 54911
Ozaukee	(414) 284-9411	P.O. Box 994 Port Washington, WI 53074-0994
Pepin	(715) 672-8850	Govt. Center, 740 7th Ave. West, P.O. Box 39 Durand, WI 54736
Pierce	(715) 273-3531 (Ext. 209)	P.O. Box 87 Ellsworth, WI 54011
Polk	(715) 485-3161 (Ext. 273)	County Courthouse Balsam Lake, WI 54810
Portage	(715) 346-1483	County Courthouse, 1516 Church St. Stevens Point, WI 54481
Price	(715) 339-2559	Register of Deeds, Price County Courthouse Phillips, WI 54555
Racine	(414) 636-3832	730 Wisconsin Ave. Racine, WI 53403
Richland	(608) 647-4720	Richland County Courthouse, P.O. Box 348 Richland Center, WI 53581
Rock	(608) 755-2113	51 S. Main St. Janesville, WI 53545
Rusk	(715) 532-2143	311 E. Miner Ave. Ladysmith, WI 54848

St. Croix	(715) 386-4676	911 4th St. Hudson, WI 54016
Sauk	(608) 356-5581	515 Oak St. Baraboo, WI 53913
Sawyer	(715) 634-3564	P.O. Box 441 Hayward, WI 54843
Shawano	(715) 526-9330	Courthouse, Rm. 10, 311 N. Main St. Shawano, WI 54166
Sheboygan	(920) 459-3100	615 N. 6th St. Sheboygan, WI 53081
Taylor	(715) 748-3131 (Ext. 125)	224 S. 2nd St. Medford, WI 54451
Trempealeau	(715) 538-2311 (Ext. 248)	Courthouse Whitehall, WI 54773
Vernon	(608) 637-2302	P.O. Box 49 Viroqua, WI 54665
Vilas	(715) 479-3660	P.O. Box 369 Eagle River, WI 54521
Walworth	(414) 741-4323	P.O. Box 1001 Elkhorn, WI 53121
Washburn	(715) 468-2232	Courthouse, P.O. Box 337 Shell Lake, WI 54871
Washington	(715) 335-4370	432 E. Washington, P.O. Box 1986 West Bend, WI 53095
Waukesha	(414) 548-7578	515 W. Moreland Blvd., Rm. 109 Waukesha, WI 53188
Waupaca	(715) 258-6215	811 Harding St. Waupaca, WI 54981
Waushara	(920) 787-4631 (Ext. 252)	P.O. Box 338 Wautoma, WI 54982
Winnebago	(920) 236-4778	P.O. Box 2808 Oshkosh, WI 54903-2808
Wood	(715) 421-8482	400 Market St. Wisconsin Rapids, WI 54494

SPRINKLERS IN ELEVATORS

When a building is fully sprinklered in accordance with NFPA 13-1994 Edition, sprinklers are required in the elevator machine room, at the top of the elevator shaft and in the elevator hoistway pit.

So, what's the deal? Why is there so much confusion around the state about this issue? Well, the deal is, in reviewing the state codes and adopted standards regarding this issue, we have discovered it's very complicated. There is a multitude of requirements and exceptions that apply only to sprinklers installed in elevator hoistways and machine rooms. Additionally, there are some new plumbing requirements for elevators, those are also included in this revision.

To try to clear some of the confusion, let's look at the latest requirements and exceptions that pertain to sprinklers in elevators.

All of the following are mandatory:

1. The elevator machine room must be sprinklered. There are no exceptions.
   See Comm 51.23 (1) (a) and NFPA 13:4.1.1

2. Sidewall spray sprinklers must be installed at the bottom of each elevator hoistway, not more than two feet above the floor of the pit.
   See NFPA 13:4-5.5.1.

   EXCEPTION: For enclosed, noncombustible elevator shafts that do not contain combustible hydraulic fluids, the sprinklers at the bottom of the shaft are not required.

3. Upright or pendant spray sprinklers must be installed at the top of elevator hoistways.
   See NFPA 13:4-5.5.3.

   EXCEPTION: Sprinklers are not required at the tops of noncombustible hoistways of passenger elevators whose car enclosure materials meet the requirements of ASME A17.1, Safety Code for Elevators and Escalators.

4. Sprinklers installed in the hoistway or machine room must be of the "ordinary or intermediate" temperature classification. This means a sprinkler with a temperature rating of 135 to 225 °F.
   See NFPA 13:Table 2-2.3.1 and NFPA 13:4-5.5.2.

5. Sprinkler risers may not be located in the hoistway.
   See ASME A17.1 Rule 102.2 (c) (1)

6. Sprinkler branch lines in the hoistway may not supply sprinklers at more than one floor level. See ASME A17.1 Rule 102.2 (c)(2).

7. "Fire fighters' service" must be provided.
   See Comm 18.21 (1) (b) and NFPA 72:3-8.15

8. Smoke detection must be provided in the hoistway, elevator lobbies and the machine room to initiate fire fighters' service.
   See Comm 18.21 (3) (a) 2. and Comm 18.31 (3) (b)

9. Smoke detectors used to initiate fire fighters' service must be connected to the building fire alarm system. If no fire alarm system is provided in the building, the smoke detectors shall be connected to a dedicated fire alarm system control panel, which will be designated "Elevator Recall Control and

Supervisory Panel".
See NFPA 72:3-8.15.1

10. Each smoke detector used to initiate fire fighters' service must be capable of initiating elevator recall when all other devices on the same circuit have been placed in the alarm condition.
See NFPA 72:3-8.15.2

11. When a smoke detector initiates fire fighters' service that action must initiate the building fire alarm system and visually indicate at the control panel and required remote annunciators the circuit or zone that is in alarm.
See NFPA 72:3-15.3

12. There are separate requirements for the connection of smoke detectors, and for the control circuits of fire fighters' service, when groups of elevators are provided in the building.
See NFPA 72:3-15.4

13. Heat detection must be provided to activate the disconnecting means prior to the actuation of the sprinkler.
See Comm 18.21 (3) (a) 3.

14. The disconnecting means must be a shunt trip circuit breaker, or other disconnecting means which may not be self-resetting. The actuation of sprinklers outside of the hoistway or machine room shall not disconnect the main line power supply.
See ASME A17.1 Rule 102.2 (c) (4)

15. Heat detectors used to shutdown elevator power must have both a lower temperature rating and a higher sensitivity when compared to the sprinkler. This means the heat detector will have a lower Response Time Index (RTI) than the sprinkler.
See NFPA 72: 3-8.16.1

16. A heat detector must be located within 2 feet of each sprinkler in the hoistway and the machine room. Or, calculations may be performed to determine heat detector location, as specified in the adopted standard.
See NFPA 72: 3-8.16.2

17. Where pressure or waterflow switches are used in conjunction with heat detection, the use of devices with time delays is not allowed.
See NFPA 72: 3-8.16.3

18. An acceptance test that will verify proper operation of the initiation of fire fighters' service and the actuation of the main line disconnect must be performed in the presence of the authority having jurisdiction.
See Comm 18.21 (3) (b) and Appendix Comm A-18.21

19. Smoke detectors may not be used to activate the sprinkler or to disconnect the main line power supply.
See ASME A17.1 Rule 102.2 (c) (5)

20. A shutoff valve is not required on a sprinkler branch line serving the hoistway or machine room.
See Comm 18.21 (2)

21. In buildings where sprinklers are installed in the basement only, sprinklers must also be provided in hoistways that serve the basement level as required by NFPA 13.
See Comm 51.23 (3)

22. Plumbing sumps may not be located in the machine room.
See Comm 18.21 (1) (a) and Comm 82.33 (9) (f) 3.

23. A plumbing drain or sump must be provided in every elevator hoistway pit. The drains must comply with the applicable requirements specified in the state plumbing code.
See Comm 18.23

24. A sump located in the hoistway may only receive the storm or clearwater waste from the elevator pit drain, the hoistway foundation drain, and the machine room foundation drain.
See Comm 82.33.(9) (f) 5.

25. A sump located in the hoistway must be provided with a removable cover, which may be an open grate cover.
See Comm 82.36 (11) (a) 2. and Comm 82.36 (11) (a) 5. b.

26. The minimum size of a sump installed in the hoistway pit is 16" in diameter at top, 14" in diameter at the bottom and 22" deep.
See Comm 82.36 (11) (a) 4.

27. A sump installed in the hoistway pit must have the rim level with the floor.
See Comm 82.36 (11) (a) 2. b.

28. Other pipes or ducts conveying gases, vapors, or liquid and not used in connection with the elevator may not be installed in the hoistway or machine room. This does not include a branch line serving sprinklers on a single floor level, and the plumbing piping serving the pit drain, because they are used in connection with the elevator.
See ASME A17.1 Rule 102.2 (c) and (d)

Additional Commentary:

We must not forget to mention ADA requirements. The barrier-free codes apply. The elevator controls in the car must be accessible. See Chapter Comm 69.

Staff at the Wisconsin Department of Health and Family Services (DHFS) indicate there are no special rules or requirements for sprinklers in elevators in buildings within their jurisdiction. If you submit sprinkler plans to DHFS that comply with the rules mentioned above, your plans will be approved.

As people learn the advantages of providing sprinkler fire protection in multi-family buildings, questions arise regarding elevators in residential buildings protected with sprinklers using an NFPA 13R system. The requirements for these occupancies are in NFPA 13R:2-6. There is an exception in NFPA 13R that allows for not installing sprinklers in the hoistway and the machine room. Commerce has allowed the use of this exception. Therefore, sprinklers are not required in the hoistway and machine room in buildings using the NFPA 13R standard. However, if the owner chooses to install the sprinklers in the hoistway or machine room, all the requirements for fire fighters' service and elevator shutdown will apply.

The 1994 edition of NFPA 13, Installation of Sprinkler Systems, is adopted in the state commercial building code, with an effective date of April 1, 1995.

The 1993 edition of NFPA 72, the National Fire Alarm Code, is adopted in the state elevator code, with an effective date of May 1, 1998.

The material contained in this appendix is for clarification purposes only. The material is numbered to correspond to the number of the rule as it appears in the text of the rule.

A-18.21 INSTALLATION OF PIPES OR DUCTS CONVEYING GASES, VAPORS OR LIQUIDS IN HOISTWAYS, MACHINE ROOMS OR MACHINERY SPACES. The following information provides the intent of the requirements relating to the installation of sprinklers in the elevator machine rooms and elevator hoistways.

The intent of s. Comm 18.21 and the following adopted national standards, ASME A17.1, NFPA 13 and NFPA 72 as they relate to fire sprinklers installed in elevator machine rooms and elevator hoistways is threefold and sequential. When smoke and rapid temperature rise from a fire is detected in either the machine room or the hoistway, the following sequence of events must occur:

1. Smoke detectors are provided in machine rooms and elevator hoistways to initiate fire fighters' service. A smoke detector is required because it is a type of fire detector that has a fast response time in reaction to fire growth. The purpose of fire fighters' service is to dispatch elevators to a specific floor designated by the fire department when the smoke detector alarm is activated. The elevator cars will remain at the designated floor for use by emergency personnel only.

2. Heat detectors are provided to initiate the disconnection of the primary electrical power source to the elevator. The heat detector responds to a specific temperature by tripping an automatic circuit breaker, which must be of the manual reset type. Heat detectors used to initiate the elevator shutdown must have both a lower temperature rating and a faster response time index (RTI) as compared to the automatic fire sprinklers installed in the hoistway or in the machine room.

3. Fire sprinklers are provided to control and suppress the fire. When the fire sprinkler responds to a specific temperature, water is released and distributed over the fire, thereby wetting, smothering, cooling and extinguishing the fire.

Summary:

1. Prior to water flow from the fire sprinklers, the power must be disconnected. This is the reason a heat detector must be located within two feet of each sprinkler installed in the hoistway or in the machine room.

2. A preaction sprinkler system may be installed to comply with Comm 18.21, but the use of a preaction system is not required.

3. The required acceptance test should be performed in the presence of the owner's representative, the local fire inspector and the elevator inspector who will be issuing the certificate to operate the elevator. The owner's representative may be the responsible design professional or the elevator contractor. The local building inspector may also want to witness this acceptance test. Bringing all interested parties together for one acceptance test will help avoid delays in the required approval process.

4. The acceptance test must verify that each smoke detector installed in the hoistway, in the machine room, and in the elevator lobbies will initiate fire fighters' service. The heat detectors installed in the hoistway and in the machine room must disconnect the power to the elevator. If these actions are verified, the requirements have been met and the systems may be accepted and placed into operation. If deficiencies are discovered, corrections must be made and followed by another acceptance test.

5. For elevators without sprinklers see the requirements of Comm 18.31.

Here's hoping this clears up some of the issues of sprinklers in elevators.

Building/Elevator Code Coordination

Examples of Sprinkler/Smoke/Heat Detector Location

November 5, 1997
(Revised for Effective Date May 1, 1998)

Case 1: Building completely sprinklered per NFPA 13.
-combustible hoistway
-electric or hydraulic elevator
-machine room in basement

	Hoistway	Machine Room
2nd Floor	Top of Shaft -Sprinkler -Heat detector -Smoke detector	
1st Floor	N/A	
Basement	Bottom of Shaft -sprinkler -heat detector	-sprinkler -heat detector -smoke detector

Case 2: Building completely sprinklered per NFPA 13.
-new passenger elevator
-non-combustible hoistway (roof deck and walls)
-hydraulic unit
-machine room in basement

	Hoistway	Machine Room
2nd Floor	Top of Shaft -Smoke detector	
1st Floor	N/A	
Basement	Bottom of Shaft -sprinkler -heat detector	-sprinkler -heat detector -smoke detector

Case 2a: Building completely sprinklered per NFPA 13.

-new freight elevator
-non-combustible hoistway (roof deck and walls)
-hydraulic unit
-machine room in basement

	Hoistway	Machine Room
2nd Floor	Top of Shaft -Sprinkler -Heat detector -Smoke detector	
1st Floor	N/A	
Basement	Bottom of Shaft -sprinkler -heat detector	-sprinkler -heat detector -smoke detector

Case 3: Building completely sprinklered per NFPA 13.

-combustible hoistway
-electric traction elevator
-penthouse machine room

	Hoistway	Machine Room
Penthouse		-sprinkler -heat detector -smoke detector
2nd Floor	Top of Shaft -sprinkler -heat detector -smoke detector	
1st Floor	N/A	
Basement	Bottom of Shaft -sprinkler -heat detector	

Case 4: Building completely sprinklered per NFPA 13.
-new passenger elevator
-non-combustible hoistway (roof deck and walls)
-electric traction elevator
-penthouse machine room

	Hoistway	Machine Room
Penthouse		-sprinkler -heat detector -smoke detector
2nd Floor	N/A	
1st Floor	N/A	
Basement	N/A	

Case 4a: Building completely sprinklered per NFPA 13.
-new freight elevator
-non-combustible hoistway (roof deck and walls)
-electric traction elevator
-penthouse machine room

	Hoistway	Machine Room
Penthouse		-sprinkler -heat detector -smoke detector
2nd Floor	Top of Shaft -sprinkler -heat detector -smoke detector	
1st Floor	N/A	
Basement	N/A	

Case 5: Building sprinklered per NFPA 13R.
-combustible or non-combustible hoistway
-electric or hydraulic elevator
-machine room in basement/ground floor
-apartment building/motel with dwelling units in basement

	Hoistway	Machine Room
2nd Floor	N/A	
1st Floor	N/A	
Basement/ground floor	N/A	-smoke detector if fire-fighter's service provided

Case 6: Building sprinklered per NFPA 13R.
-non-combustible hoistway (roof deck and walls)
-hydraulic elevator
-machine room in basement/ground floor
-apartment building/motel with basement/ground floor parking garage

	Hoistway	Machine Room
2nd Floor	Top of Shaft -smoke detector	
1st Floor	N/A	
Basement/ground floor	Bottom of Shaft -sprinkler -heat detector	-sprinkler -heat detector -smoke detector

Case 7: Building sprinklered per NFPA 13R
-combustible or non-combustible hoistway
-electric traction elevator
-penthouse machine room
-basement/ground floor (w/ fire department access openings)
-apartment building/motel w/living units in lower level

	Hoistway	Machine Room
Penthouse		-smoke detector if fire-fighter's service provided
2nd Floor	Top of Shaft -May have smoke detector	
1st Floor	N/A	
Basement/ground floor	N/A	

Case 8: Building sprinklered per NFPA 13R with basement/ground floor sprinklered as per NFPA 13 because windowless floor level.
-combustible hoistway
-electric or hydraulic elevator
-machine room in basement/ground floor

	Hoistway	Machine Room
2nd Floor	Top of Shaft -Sprinkler -heat detector -smoke detector	
1st Floor	N/A	
Basement/ground floor	Bottom of Shaft -sprinkler -heat detector	-sprinkler -heat detector -smoke detector

Case 9: Building partially sprinklered per NFPA 13R with basement/ground floor sprinklered as per NFPA 13 because windowless floor level.

-new passenger elevator
-non-combustible hoistway (roof deck and walls)
-hydraulic unit
-machine room in basement/ground floor

	Hoistway	Machine Room
2nd Floor	Top of Shaft -smoke detector	
1st Floor	N/A	
Basement/ground floor	Bottom of Shaft -sprinkler -heat detector	-sprinkler -heat detector -smoke detector

Case 9a: Building partially sprinklered per NFPA 13R with basement/ground floor sprinklered as per NFPA 13 because windowless floor level.

-new freight elevator
-non-combustible hoistway (roof deck and walls)
-hydraulic unit
-machine room in basement/ground floor

	Hoistway	Machine Room
2nd Floor	Top of Shaft -sprinkler -heat detector -smoke detector	
1st Floor	N/A	
Basement/ground floor	Bottom of Shaft -sprinkler -heat detector	-sprinkler -heat detector -smoke detector

Case 10: Building partially sprinklered per NFPA 13R with basement/ground floor sprinklered as per NFPA 13 because windowless floor level.

-new passenger or freight elevator
-combustible hoistway
-electric traction elevator
-penthouse machine room
-basement/ground floor

	Hoistway	Machine Room
Penthouse		-smoke detector
2nd Floor	Top of Shaft -sprinkler -heat detector -smoke detector	
1st Floor	N/A	
Basement/ground floor	Bottom of Shaft -sprinkler -heat detector	

Case 11: Building sprinklered per NFPA 13R with basement/ground floor sprinklered as per NFPA 13 because windowless floor level.

-new passenger elevator
-non-combustible hoistway (roof deck and walls)
-electric traction elevator
-penthouse machine room
-basement/ground floor

	Hoistway	Machine Room
Penthouse		-smoke detector if fire-fighter's service provided
2nd Floor	Top of Shaft -may have smoke detector	
1st Floor	N/A	
Basement	N/A	

Case 12: Building partially sprinklered -- basement/ground floor sprinklered as per NFPA 13 because windowless floor level.

-combustible hoistway
-electric or hydraulic elevator
-machine room in basement/ground floor

	Hoistway	Machine Room
2nd Floor	Top of Shaft -sprinkler -heat detector -smoke detector	
1st Floor	N/A	
Basement/ground floor	Bottom of Shaft -sprinkler -heat detector	-sprinkler -heat detector -smoke detector

Case 13: Building partially sprinklered-- basement/ground floor sprinklered as per NFPA 13 because windowless floor level.

-combustible hoistway
-electric traction elevator
-penthouse machine room
-basement/ground floor

	Hoistway	Machine Room
Penthouse		-smoke detector if fire-fighter's service provided
2nd Floor	Top of Shaft -sprinkler -heat detector -smoke detector	
1st Floor	N/A	
Basement/ground floor	Bottom of Shaft -sprinkler -heat detector	

DESIGN & PLAN REVIEW CONSIDERATIONS FOR FLAMMABLE/COMBUSTIBLE LIQUIDS STORAGE ROOMS

(STORED OR USED WITHIN A COMMERCIAL BUILDING)

WHAT TYPES OF CONSTRUCTION SHOULD ALERT A DESIGNER TO A POTENTIAL DESIGN ISSUE?

Design professionals should verify with building owners / tenants if flammable/combustible liquids will be stored ***or*** used in conjunction with a commercial building (whether being built, altered, etc.).

Here are some examples of occupancies that should ***red flag*** that flammable/ combustible liquids or gases are ***likely*** to be present and a storage room or tank approval may need to be sought:

- Repair Or Service Garages (*Ch. COMM 59*)
- Woodworking Shops, Wood Fabrication Plans (*Ch. COMM 54*)
- Cold Storage Use (*Nonrefrigerated Facilities*)
- School Specialty Areas Such As Chemistry Labs, Woodworking Shops, Art Rooms, Automotive Repair Shops, Body Shops, Ag Shops, Etc.
- Physical Plant "Storage" (*E.G., At University Or Other Institutions*)
- ***Any*** "Hazardous Material" Storage
- Facilities Involved In Plastics Manufacture (*Ch. COMM 54*)
- Dry Cleaning Stores Or Facilities (*Ch. COMM 54*)
- Storage Areas In Hospitals, Clinics, Labs, Etc.
- Facilities That Use "Organic Coatings" (*Ch. COMM 54*)
- Storage Areas In Mercantile Establishments That Sell Any Kind Of Chemicals, Sell Automotive Supplies, Or Perform Service Work, Etc.

If a chemical or material being used or stored is either a flammable /combustible liquid or gas, the building designer ***should request the material safety data sheet (MSDS)*** for each chemical with unknown properties or of concern.

Information that should be evaluated on the MSDS includes the flashpoints of the chemicals, the chemical properties (Does the chemical react with water?; Is it corrosive?, etc.), and the hazards the chemical presents to people.

OTHER KEY INFORMATION THAT SHOULD BE ESTABLISHED TO DETERMINE REPORTING, STORAGE, SPRINKLERING OR OTHER REQUIREMENTS ARE:

- What are the quantities of each hazardous material or flammable /combustible liquid present, whether for manufacturing process, use or storage?
- If more than one day's usage of chemical is in the building, then must provide proper storage with cabinets, rooms or approved tanks. (NFPA 5-5.4)
- What type/size of containers or vessels will these materials or chemicals be stored in?
- Have the MSDS sheets available when working with the fire department and other code enforcement staff.

- Suggestion for improved site safety: maintain any emergency contact or special information where it is readily available to fire department staff or other staff who may respond in the event of an emergency or accident within the building or area where the chemicals or materials are.

HOW DOES THIS IMPACT THE BUILDING PLAN SUBMITTAL?

For purposes of building plan review and submittal, it is important that the designer/owner clearly state on the application form as to whether or not flammable /combustible liquids will be present in the building.

Also, note that a building over 3000 square feet in floor area used for "high hazard occupancies" (such as manufacturing, processing or storage involving highly combustible or explosive products or materials) will require a complete automatic fire sprinkler system as per COMM 52.013(7). Also, shortened exit distance of 75' per COMM 54.02 may apply.

CONTAINERS/ROOMS FOR FLAMMABLE/COMBUSTIBLE LIQUID STORAGE

Information regarding proper storage of containers for flammable /combustible liquids (use MSDS sheets to identify) or gases (such as propane or compressed natural gas) is available through the district Fire Safety Consultants. Please call (608) 266-3151 for the name of the consultant nearest your project.

See the following information from COMM 10 and NFPA 30 for design, construction information for these rooms and containers.

STORAGE OF FLAMMABLE & COMBUSTIBLE LIQUIDS

CODE REFERENCES: s. Comm51.08(2), Table 51.08-2 references Chapter ILHR/Comm 10.

CHAPTER COMM 10(FLAMMABLE & COMBUSTIBLE LIQUIDS)

The purpose of COMM 10 "is to provide for the safe storage, installation, operation, use, maintenance and transportation of flammable and combustible liquids." COMM 10 is concerned primarily with those issues surrounding the bulk storage and dispensing of flammable liquids or with the protection of the state's waters from contamination by flammable and combustible liquids.

NFPA 30 (FLAMMABLE & COMBUSTIBLE LIQUIDS)

COMM 10 adopts by reference the Flammable and Combustible Liquids Code, NFPA No. 30-1987 Edition. Most of the standards referenced herein are from NFPA 30, 1993 edition, but are similar in intent or the same as the 1987 edition.

DEFINITIONS:

COMBUSTIBLE LIQUID - means a liquid having a flash point at or above 100 degrees f.

FLAMMABLE LIQUID - means a liquid having a flash point at or below 100 degrees f. and having a vapor pressure not exceeding 40 p.s.i. (absolute) at 100 degrees f. these liquids are known as class I liquids.

STORAGE CABINET- Metal or wood cabinets of 120 gallon capacity or less meeting the design and construction requirements outlined herein.

INSIDE STORAGE ROOM - Is a room totally enclosed within a building and having no exterior walls.

CUTOFF ROOM - is a room within a building and having at least one common exterior wall

ATTACHED BUILDING - is a building (room) which has only one common wall with another building.

CLASSIFICATION OF SOME COMMON LIQUID BULK PRODUCTS

CLASS	PRODUCT	FLASH POINT	BOILING POINT
FLAMMABLE LIQUIDS CLASS IA	AUTOMOTIVE GASOLINE AVIATION GASOLINE JET FUEL JP-4 PENTANE VINYL CHLORIDE ETHYLENE CHLORIDE ISOPRENE PROPYLENE	BELOW 73 DEG F.	BELOW 100 DEG F.
FLAMMABLE LIQUIDS CLASS IB	ACETONE BENZENE COAL TAR OIL DENATURED ALCOHOL ACROLEIN CHLOROBENZINE METHYL ALCOHOL (METHANOL) HEXANE STYRENE METHYL ETHYL KETONE (MEK) NAPTHA, VM and P CRUDE PETROLEUM TOLUENE ETHYL ALCOHOL HEPHANE VINYL ACETATE XYLENE	BELOW 73 DEG. F.	ABOVE 100 DEG. F.
FLAMMABLE LIQUIDS CLASS IC	TURPENTINE WHISKEY	BETWEEN 73 AND 100 DEG. F.	
COMBUSTIBLE LIQUIDS CLASS II	ACETIC ACID CAMPHOR OIL CELLOSOLVE SOLVENT FUEL OIL NO. 1 FUEL OIL NO. 1-D JET FUEL JP-5 JET FUEL JP-6 KEROSENE MINERAL SPIRITS NAPTHA STODDARD SOLVENT	BETWEEN 100-140 DEG. F.	

CLASS	PRODUCT	FLASH POINT	BOILING POINT
COMBUSTIBLE LIQUIDS CLASS IIIA	BRAKE FLUID CREOSOTE PHENOL DIESEL FUEL (65 DIESEL INDEX) GAS OIL FUEL OIL NO. 2 FUEL OIL NO. 2-D FUEL OIL NO. 4 FUEL OIL NO. 5 FUEL OIL NO. 6	ABOVE 140 DEG. F. AND LESS THAN 200 DEG. F.	
COMM 10 FLAMMABLE & COMBUSTIBLE LIQUIDS CODE DOES NOT APPLY TO THESE PRODUCTS WHOSE FLASHPOINTS EXCEED 200 DEG F. (IIIB)	ASPHALT CASTOR OIL GEAR OIL HYDRAULIC FLUID LINSEED OIL LUBRICATING OIL MINERAL OIL MOTOR OIL NEAT'S FOOT OIL PENETRATING OIL TRANSFORMER OIL TRANSMISSION OIL EDIBLE OILS	300-550 445 450 340 535 300 380 275-600 430 295 295 310 450-640 (DEG. F.)	

FLAMMABLE LIQUIDS STORAGE CABINETS

1. MAXIMUM STORAGE QUANTITIES PERMITTED

- Maximum 120-gal per cabinet (total of all liquid classifications combined)
- Maximum 3-cabinets per fire area
- Of this total, a maximum of 60-gal for class 1 & 2 combined
- Industrial occupancies
- Additional cabinets permitted in same fire area if separated by 100-ft

2. CABINET VENTING

Not required

- All vent openings shall be sealed

If vented for other reasons (health & safety)

- Vented to outside of building
- Mechanical ventilation preferred per NFPA 91
- Exhaust from the bottom with makeup air into the top
- No manifolding of vents
- Acceptable to authority having jurisdiction

3. METAL CABINET CONSTRUCTION

- Listed by cabinet manufacturer or built as outlined below
- Number 18-gauge sheet steel (double walled with 1 1/2-in air space)
- Joints riveted, welded, or other equally effective means
- Doors
- Three point door latch arrangement
- 2-in raised sill (liquidtight) or drip pan for spill containment

4. WOODEN CABINET CONSTRUCTION

- Minimum 1-in exterior grade plywood
- Joints rabbetted & fastened in 2 directions with wood screws
- Doors
- 1-in rabbetted overlap for 2 door cabinets
- Means of latching provided
- Hinges mounted to not lose their holding capacity during a fire exposure
- 2-in raised sill (liquidtight) or drip pan for spill containment

DESIGN & CONSTRUCTION REQUIREMENTS FOR INSIDE FLAMMABLE AND COMBUSTIBLE LIQUIDS STORAGE ROOMS (SEE NFPA 30 FOR SPECIFIC DETAILS)

INSIDE STORAGE ROOMS,CUT-OFF ROOMS, ATTACHED BUILDINGS, STORAGE TANKS:

1. SEPARATED FROM OTHER PARTS OF BUILDING BY FIRE RESISTIVE CONSTRUCTION(Interior Walls, Ceilings, Intermediate Floors) (NFPA 30, 4-4.2.1)
   - Inside storage room less than 150 sf. (1 hr)
   - Inside storage room more than 150 sf. (2 hr)
   - Cutoff room and attached buildings less than 300 sf (1 hr)
   - Cutoff room and attached buildings over 300 sf (2 hr)
2. FIRE DOORS WITH AUTOMATIC CLOSERS SHALL BE PROVIDED AS FOLLOWS
   - 1 hour construction requires ¾ hour rated door
   - 2 hour construction requires 1 hour rated door
   - 4 hour construction requires 3 hour rated door
3. CONSTRUCTION DESIGN OF EXTERIOR WALLS SHALL PROVIDE FOR READY ACCESSIBLITY FOR FIRE FIGHTING THROUGH PROVISION OF ACCESS OPENINGS, WINDOWS OR LIGHTWEIGHT NON-COMBUSTIBLE WALL PANELS.
4. WHERE CLASS 1A OR 1B LIQUIDS OR UNSTABLE LIQUIDS ARE DISPENSED, OR WHERE CLASS 1A LIQUIDS ARE STORED IN CONTAINERS LARGER THAN 1 GALLON, THE EXTERIOR WALL OR ROOF CONSTRUCTION SHALL INCORPORATE DEFLAGRATION VENTING. (SEE NFPA 68)
5. EXCEPT FOR DRAINS, FLOORS SHALL BE LIQUIDTIGHT AND THE STORAGE AREA SHALL BE LIQUIDTIGHT WHERE THE WALLS JOIN THE FLOOR.
6. MEANS SHALL BE PROVIDED TO PREVENT THE FLOW OF LIQUIDS INTO ADJOINING AREAS OF THE BUILDING. THIS SHALL BE ACCOMPLISHED BY ONE OF THE FOLLOWIING METHODS OVER THE ENTIRE WIDTH OF EACH OPENING:
   - Non-combustible liquid tight raised sills, curbs or ramps of a suitable height(1987 Edition Says 4" Curb, 1993 Edition Is Silent)
   - Open-grated trenches
   - Other means acceptable to the authority having jurisdiction
7. WHERE AUTOMATIC SPRINKLERS ARE PROVIDED, MEANS SHALL BE PROVIDED TO PREVENT BURNING LIQUIDS FROM EXPOSING OTHER STORAGE PILES OR RACKS AND FROM EXPOSING OTHER IMPORTANT BUILDINGS, ADJOINING PROPERTIES OR CRITICAL NATURAL RESOURCES.
8. ELECTRICAL EQUIPMENT AND WIRING IN INSIDE STORAGE ROOMS SHALL BE SUITABLE FOR CLASS I, DIVISION 2 HAZARDOUS LOCATIONS. (NFPA 70)
9. WHERE CLASS I LIQUIDS ARE DISPENSED OR WHERE CLASS II OR CLASS III LIQUIDS AT TEMPERATURES AT OR ABOVE THEIR FLASH POINTS ARE

DISPENSED, ELECTRICAL EQUIPMENT AND WIRING SHALL BE SUITABLE FOR CLASS I, DIVISION 2 HAZARDOUS LOCATIONS. IN ADDITION, ANY ELECTRICAL EQUIPMENT LOCATED WITHIN 3 FEET OF DISPENSING NOZZLES SHALL BE SUITABLE FOR CLASS I, DIVISION I HAZARDOUS LOCATIONS.

10. LIQUID STORAGE AREAS WHERE DISPENSING IS CONDUCTED SHALL BE PROVIDED WITH EITHER GRAVITY OR CONTINUOUS MECHANICAL EXHAUST VENTILATION SYSTEM. IF CLASS I LIQUIDS ARE DISPENSED, THEN MECHANICAL VENTILATION SHALL BE USED.

- Exhaust air shall be taken on one side of the room within 12 in. Of the floor.
- Make-up air inlets shall be on the oppposite side of the exhaust air outlet at be within 12 in. Of the floor.
- Exhaust shall be directed to the exterior of the building without recirculation.
- Mechanical ventilation shall provide at least 1 cfm of exhaust per sf of floor area, but not less than 150 cfm. The mechanical ventilating system for dispensing areas shall be provided with an airlow switch or similar device that is interlocked to sound an audible alarm upon failure of the ventilation system.

11. CLASS 1 LIQUIDS SHALL NOT BE PERMITTED TO BE STORED IN BASEMENTS. CLASS II AND CLASS IIIA SHALL BE PERMITTED TO BE STORED IN BASEMENTS PROVIDED WITH AUTOMATIC SPRINKLER SYSTEMS

MAXIMUM STORAGE LIMITATIONS FOR SELECTED OCCUPANCIES

OCCUPANCY	LIQUID TYPE (CLASS) MAXIMUM CONTAINER SIZE	MAXIMUM QUANTITY	MAXIMUM HEIGHT	FIRE SEPARATION
GENERAL PURPOSE WARE-HOUSE	1A IB (1 GALLON) IC(1GALLON) II (5 GALLONS) IIIA (60 GALLONS) IIIB (60 GALLONS)	NOT PERMITTED 660 GALLONS 660 GALLONS 1375 GALLONS 2750 GALLONS 13,750 GALLONS	 5 FEET 5 FEET 5 FEET 10 FEET 15 FEET	 4 HOUR 2 HR (AHJ)*
DWEL-LINGS (3 UNITS OR LESS) AND GARAGES	I & II COMBINED IIIA	25 GALLONS 60 GALLONS	N/A N/A	N/A N/A

OCCUPANCY	LIQUID TYPE (CLASS) MAXIMUM CONTAINER SIZE	MAXIMUM QUANTITY	MAXIMUM HEIGHT	FIRE SEPARATION
ASSEMBLY OCCUPANCIES, DWELLING OVER 3 UNITS, HOTELS	I OR II III	10 GALLONS 60 GALLONS	N/A N/A	MUST BE IN STORAGE CABINET, SAFETY CAN OR INSIDE STORAGE ROOM
OFFICE, EDUCATIONAL INSTITUTIONAL	I I & II COMBINED I& II IN SAFETY CANS III	1GALLON 10 GALLONS** 25 GALLONS** 60 GALLONS	N/A N/A	QUANTITIES IN EXCESS OF THOSE SHOWN MUST BE IN STORAGE CABINETS OR INSIDE STORAGE ROOM
MERCANTILE	IB,IC,II,IIIA COMBINED IB,IC,II,IIIA COMBINED (GROIUND FLOOR) IB,IC,II,IIIA COMBINED (OTHER THAN GROUND FLOOR)	4 GALLONS/SF 2 GALLONS/SF 1 GALLON/SF	N/A N/A N/A	PROTECTED AREAS UNPROTECTED AREAS UNPROTECTED AREAS
MANUFACTURING WITH INCIDENTAL USAGE				QUANTITIES IN EXCESS OF A DAY'S USAGE MUST BE IN STORAGE CABINETS, APPROVED TANKS OR INSIDE STORAGE ROOM

*If approved by authority having jurisdiction

**Per fire area(Areas separated by 100 feet)

INSIDE STORAGE ROOMS

TOTAL FLOOR AREA	AUTO FIRE PROT REQUIRED?	ALLOWABLE GALLONS PER SF FLOOR AREA
UNDER 150 SF	NO	2
	YES	5
150 - 500 SF	NO	4
	YES	10

APPENDIX B - Fire Department Inspection Checklist

The material contained in this appendix is for clarification purposed only. The information is for the benefit of fire department inspectors making inspections pursuant to s. 101.14 (2)(b), Stats. (See s. COMM 50.02 Special Note #2)

Rule Number	Topic of Rule	Subject of Investigation
	Ch. COMM 50-Administration and Enforcement	
50.25	Petition for Variance	1. Fire Department Position Statement (form SB-8A)
	Ch. COMM 51-Definitions and Standards	
51.047	Fire Rated Door Assemblies in Fire Rated Construction	1. Maintenance 2. Operation 3. Unobstructed
51.047 (6)	Door Closing Devices (Fire Doors)	1. Maintenance 2. Use of Fusible Link
51.06 (3)	Foam Plastics (Thermal Barrier)	1. Proper Type and Correct Installation 2. Maintenance
51.15 (2)	Exit Doors	1. Maintenance 2. Unobstructed
51.15 (3)	Exit Hardware	1. Proper Type 2. Signage 3. Security Locks and Key Locks Open During Occupied Periods
51.15 (4)	Exit Doorway	1. Proper Size and Type 2. Maintenance
51.161	Handrails	1. Maintenance 2. Replacement, when Needed
51.162	Guardrails	1. Maintenance 2. Replacement, when Needed
51.165	Stairway Identification	1. Proper Posting 2. Proper Signage on Buildings Constructed After January 1, 1982
51.166	Stairway Discharge	1. Proper Type 2. Maintenance
51.167	Exiting Through Areas of Hazard	1. Proper Type
51.20	Fire Escapes	1 Maintenance
51.21	Standpipe and Hose Systems	1. Correct Installation 2. Maintenance
51.22	Fire Extinguishers	1. Proper Type 2. Location 3. Maintenance 4. Operational
51.23	Automatic Sprinklers	1. Water Supply 2. Obstruction of Sprinkler Heads 3. Location of Fire Department Connection 4. Accessibility of Fire Department Connection
51.24 (5)	Fire Alarm Systems	1. Operation & Testing

Rule Number	Topic of Rule	Subject of Investigation
		2. Location of Pull Stations
51.245	Smoke Detectors	1. Correct Installation
		2. Maintenance of Detectors
		3. Operational
	Ch. COMM 52-General Requirements	
52.01	Fire Prevention, Detection and Suppression (High Rise Construction)	1. Proper Installation 2. Maintenance 3. Operation and Testing
52.011	Automatic Fire Sprinkler Systems for Low Rise Buildings	1. Proper Installation 2. Maintenance 3. Operation and Testing
52.02 (2)	Fire Department Access Openings	1. Proper Type, Size and Location 2. Maintenance
52.07	Atriums	1. Proper Type 2. Smoke Control System 3. Maintenance 4. Test Reports
52.19	Gas and Oil Lamps	1. Proper Type and Clearance 2. Maintenance
52.20	Electrical Work	1. Electrical Check List
52.21	Location and Maintenance of Exits	1. Maintenance
52.22	Repairs	1. Conformance
52.23	Cleanliness	1. Conformance
	Ch. COMM 53-Structural Requirements	
53.63 (1) (a)-(c)	Firestops	1. Maintenance
	Ch. COMM 54-Factory, Office, Mercantile	
54.01 (3)	Fire Door Closing Devices	1. Maintenance 2. Operational
54.02	Number and Location of Exits	1. Maintenance 2. Proper Exit Hardware
54.06	Exit Doors, Exit Lights	1. Maintenance of Illumination
54.07	Passageways	1. Maintenance in Clear, Unobstructed Condition
54.08	Stairway Enclosure	1. Maintenance
54.11	Lighting	1. Maintenance of Illumination
54.14	Isolation of Hazards	1. Maintenance
54.145	Fire Extinguishers	1. For Buildings Constructed After January 1, 1982: A. Proper Type B. Location C. Maintenance D. Operational
54.15	Standpipes	1. Maintenance
54.17	Fire Alarm	1. Maintenance 2. Location of Pull Stations
54.20	No Smoking Signs	1. Proper Posting
	Ch. COMM 55-Theaters and Assembly Halls	
55.07	Number and Location of Exits	1. Maintenance of Illumination
55.08	Type of Exits	1. Maintenance

Rule Number	Topic of Rule	Subject of Investigation
		2. To be Clear and Unobstructed
55.09	Stairways	1. Maintenance 2. To be Clear and Unobstructed
55.10	Exit Doorways and Doors	1. See 51.15
55.11	Exit Lights	1. Maintenance of Illumination
55.12	Required Exit Width	1. To be Unobstructed
55.14	Width of Aisles	1. To be Unobstructed
55.15	Lobbies and Foyers	1. To Be Clear and Unobstructed
55.17	Obstructions	1. Maintenance
55.22 (3)	Proscenium Wall (Openings)	1. Proper Type 2. Maintenance
55.24	Automatic Smoke Outlets	1. Operation
55.29	Isolation of Hazards	1. Maintenance of Enclosures
55.33	Standpipes	1. Correct Installation 2. Maintenance
55.33 (3)	Fire Extinguishers	1. For Buildings Constructed After January 1, 1982: A. Proper Type B. Location C. Maintenance D. Operational
55.43	Openings	1. Operational 2. Maintenance
55.45	Relief Outlets	1. Maintenance
55.46	Electric Wiring	1. Electrical Check List
55.50	Maintenance	1. Elimination of Fire Hazard
	Ch. COMM 56-Schools and Places of Instruction	
56.03	Smoke Detection	1. For Existing Buildings with Basements not Protected by Automatic Sprinklers or Smoke Detectors as of January 1, 1982, Automatic Smoke Detector System in Basement Corridors by January 1, 1983. A. Correct Installation B. Maintenance of Detectors
56.06	Exit	1. Maintenance
56.06 (6)	Exit Lights	1. Maintenance of Illumination
56.07	Required Exit Width	1. To be Unobstructed
56.09	Passageways	1. To be Unobstructed 2. Maintenance of Exit Doors
56.15	Isolation of Hazards	1. Maintenance of Enclosure
56.18	Fire Extinguishers	1. Proper Type 2. Location 3. Maintenance 4. Operational
56.19	Fire Alarms	1. Operation of System 2. Location of Pull Stations
56.20	Standpipes	1. Correct Installation 2. Maintenance
56.34	Exit Doors and Lights	1. Maintenance of Doors 2. To be Clear and Unobstructed
56.38	Fire Alarms	1. Operational

Rule Number	Topic of Rule	Subject of Investigation
		2. Testing
		3. Location of Pull Stations
56.43	Exit Doors and Exit Lights	1. Maintenance of Doors
		2. To be Clear and Unobstructed
56.46	Fire Alarms	1. Operational
		2. Testing
		3. Location of Pull Stations
	Ch. COMM 57-Residential Occupancies	
57.01 (3)	Basement and Ground Floor Protection	1. Proper Installation 2. Maintenance
57.02	Allowable Height and Area (Corridor Door Hold-Open Device, Access Roadways)	1. Maintenance 2. Operational 3. Clear and Unobstructed
57.03	Number and Location of Exits	1. Maintenance 2. Proper Exit Hardware
57.05	Type of Exits	1. Maintenance 2. To be Clear and Unobstructed 3. Proper Illumination
57.08	Enclosure of Interior Stairways and Shafts	1. Maintenance of Enclosure
57.09	Passageways	1. To be Clear and Unobstructed 2. Maintenance of Exit Doors
57.10	Illumination of Exits and Exit Signs	1. Maintenance of Illumination and Signs
57.14	Isolation of Hazards	1. Maintenance of Enclosure
57.15	Standpipes	1. Correction Installation 2. Maintenance
57.16	Smoke Detectors - All Buildings Except CBRF	1. For Existing Buildings Constructed Before May 23, 1978, Specified Smoke Detectors by January 1, 1983. A. Correct Installation B. Maintenance of Detectors 2. For Buildings Constructed After January 1, 1983: A. Correction Installation B. Maintenance of Detectors C. Interconnection of Corridor/Stairway Detectors to Required Manual Fire Alarm System D. Corridor/Stairway Smoke Detectors Provided with Emergency Power, if Required for the Building
57.165	Smoke Detectors - CBRF	1. Correct Installation 2. Maintenance of Detectors 3. Interconnection of Stairway, Complete Corridor and Common Use Room Detectors 4. Interconnection of Sleeping Room Detectors if Smoking is Permitted
57.17	Fire Alarms	1. Operation of Systems 2. Location of Pull Stations
57.18	Fire Extinguishers	1. For Buildings Constructed After January 1, 1982: A. Proper Type

Rule Number	Topic of Rule	Subject of Investigation
		B. Location
		C. Maintenance
		D. Operational
57.19	Rowhouse (Living Unit Separation)	1. Proper Installation 2. Maintenance
	Ch. COMM 58-Health Care Facilities	
58.04-58.05	Number, Type and Location of Exits	1. Maintenance 2. Proper Exit Hardware
58.06	Stairs	1. Maintenance 2. To be Clear and Unobstructed 3. Proper Illumination
58.18	Marking of Means of Egress	1. Correct Signage 2. Proper Illumination
58.20	Key Locking Hardware	1. Correct Hardware Type and Installation 2. Building Satisfies Rules for Detention and Correctional Facilities 3. Maintenance
58.21-58.23	Protection of Openings	1. Maintenance
58.24	Isolation of Hazards	1. Maintenance of Enclosure and Required Automatic Sprinkler System
58.25	Rubbish Chutes and Laundry Chutes	1. Protection of Enclosure 2. Sprinkler System Maintenance
58.27	Detection, Alarm and Communication Systems	1. Operational 2. Testing 3. Location of Pull Stations 4. Correct Installation 5. Maintenance
58.28	Standpipes	1. Correct Installation 2. Maintenance
58.29	Automatic Sprinkler and Other Suppression Systems	1. Water Supply 2. Obstruction of Sprinkler Heads 3. Location and Accessibility of Fire Department Connection
58.30-58.31	Smoke Barriers, Corridor Walls	1. Correct Installation 2. Maintenance
	Ch. COMM 58-Places of Detention	
58.48-58.49	Number, Type and Location of Exits	1. Maintenance 2. Proper Exit Hardware
58.50-58.51	Stairways and Smoke-proof Towers	1. Maintenance 2. To be Clear and Unobstructed 3. Proper Illumination
58.575	Emergency Lighting	1. Proper Type 2. Maintenance
58.58	Marking of Means of Egress	1. Correct Signage 2. Proper Illumination
58.59	Door Locks	1. Correct Type and Installation 2. Maintenance
58.60-58.61	Protection of Openings	1. Maintenance
58.62	Isolation of Hazards	1. Maintenance of Enclosure
58.63	Standpipes	1. Correct Installation

Rule Number	Topic of Rule	Subject of Investigation
		2. Maintenance
58.635	Fire Extinguishers	1. Proper Type
		2. Location
		3. Maintenance
		4. Operational
58.64	Fire Alarms	1. Operation of System
		2. Location of Pull Stations
58.65	Automatic Smoke	1. Correct Installation
	Detection Systems	2. Maintenance of Detectors
58.67	Smoke Barrier	1. Correct Installation
		2. Maintenance
	Ch. COMM 59-Hazardous Occupancies	
59.13	Type of Exits	1. Maintenance
		2. Proper Exit Hardware
59.14	Number and Type of Exits	1. Maintenance
		2. To be Cleared and Unobstructed
59.17	Enclosure of Stairways and Shafts	1. Maintenance of Enclosure
59.19	Illumination Levels	1. Proper Illumination
59.21	Isolation of Hazards	1. Maintenance of Enclosures
59.23	Fire Protection	1. Operation of System
		2. Proper Type of Extinguisher
		3. Location of Extinguisher
		4. Extinguisher Operational
		5. Water Supply
		6. Obstruction of Sprinkler Heads
		7. Location & Accessibility of Fire Department Connection
		8. Maintenance of Systems
59.24	Fire Alarms	1. Operation and Testing
		2. Location of Pull Stations
	Ch. COMM 60-Child Day Care Facilities	
60.12	Doors	1. Joint Inspection Made
60.16	Electrical Work	1. Electrical Check List
60.19	Operating Features	1. Owner Responsibility
60.31	Exiting	1. Joint Inspection Made
60.32	Required Exit Width	1. Width to be Unobstructed
60.33	Passageways	1. Joint Inspection Made
60.34	Stair & Shaft Enclosure	1. Joint Inspection Made
60.35	Fire Extinguisher	1. Proper Type
		2. Location
		3. Maintenance
		4. Operational
60.36	Fire Alarm	1. Operation and Testing
		2. Location of Pull Stations
60.37	Hazardous Areas	1. Joint Inspection Made
60.38	Exit and Emergency Lighting	1. Joint Inspection Made
	Ch. COMM 61-Community-Based Residential Facilities	
61.10 (1)(h)	Construction, Building and	1. Maintenance

Rule Number	Topic of Rule	Subject of Investigation
	Site	
61.10 (3)	Smoke Separation	1. Maintenance
61.12	Exiting and Doors	1. To be Clear and Unobstructed
		2. Maintenance
61.14	Smoke Detection	1. Correct Installation
		2. Maintenance of Detectors
61.18 (4)	Ramp Requirements	1. Maintenance
61.20	Fire Extinguisher	1. Proper Type
		2. Location
		3. Maintenance
		4. Operational
61.24	Heating & Ventilating	1. Maintenance
61.25	Electrical	1. Electrical Check List
	Ch. COMM 62-Subch. I-Open Parking Structures	
62.26	Number, Location & Type of Pedestrian Exits	1. Maintenance
62.29	Illumination & Exit Lights	1. Maintenance of Illumination and Exit Lights
62.30	Fire Protection	1. Correct Installation of Standpipes
62.32	Isolation of Hazards	1. Maintenance
	Ch. COMM 62-Subch. III-Tents	
62.46	Fire Hazards	1. Elimination of Fire Hazard
62.47	Exits	1. Maintenance
62.49	Electrical Installation	1. Proper Installation
62.50	Fire Extinguishing Equipment	1. Proper Type
		2. Location
		3. Maintenance
		4. Operational
62.51	Illumination, Exit Lights and Signs	1. Maintenance of Illumination
	Ch. COMM 62-Subch. V-Assembly Seating Facilities	
62.72	Inspection & Maintenance	1. Proper Maintenance
		2. Conformance With Rules
62.75	Means of Egress	1. Maintenance
		2. To be Clear and Unobstructed
62.78	Isolation of Hazards	1. Maintenance of Enclosure
62.80	Illumination and Emergency Lighting	1. Proper Illumination
62.81	Fire Prevention	1. Maintenance
	Ch. COMM 62-Subch. VII-Pedestrian Access Structures Connecting Building	
62.98	General Requirements	1. Protection of Openings
	Construction	2. Maintenance
62.99	Exiting	1. Maintenance
		2. To be Clear and Unobstructed
	Ch. COMM 64-HVAC	
64.08	Exhaust Ventilation System	1. Maintenance
64.09	Combustion Air Intakes	1. Maintenance

Rule Number	Topic of Rule	Subject of Investigation
64.16	Air Cleansing Devices	1. Maintenance
64.19	Location of Outside Air Intakes and Exhausts for Mechanical Ventilating Systems	1. Maintenance
64.21	Location of Equipment	1. Proper Equipment 2. Maintenance
64.22 (5)	Unvented Space Heaters	1. Use Prohibited
64.22 (7)	Fireplaces and Fireplace Stoves	1. Proper Installation 2. Maintenance 3. Operation and Testing
64.23 (5) (a) and (b)	Piping	1. Installation 2. Maintenance
64.42	Fire Dampers and Fire Curtains	1. Maintenance
64.45	Chimneys, Smoke Stacks, Gas Vents, Mechanical Draft and Venting Devices	1. Maintenance
64.46	Masonry Chimneys	1. Maintenance
64.47	Metal Smokestacks	1. Maintenance
64.48	Factory-Built Chimneys and Gas Vents	1. Maintenance
64.49	Gas Vent	1. Maintenance
64.50	Chimney and Vent Connectors	1. Maintenance
64.51 (4)	Fire Protection	1. Correct Equipment 2. Proper Installation 3. Proper Clearances and Protection
64.52 (1)	Maintenance	1. Inspection of Chimney After Fire Before Reuse
64.61 (2)	Repairs Areas	1. Maintenance
64.62 (2)	Vehicle Service Buildings	1. Maintenance
64.63 (2)	Garages	1. Maintenance
64.67 (5) (e), (f) and (g)	Kitchens	1. Maintenance
64.67 (6)	Automatic Suppression Systems	1. Correct System 2. Proper Installation 3. Maintenance and Operational

DEPARTMENT OF COMMERCE

SAFETY AND BUILDINGS DIVISION

P.O. BOX 2689

Madison, Wisconsin 53701-2689

LIST OF

WISCONSIN MATERIAL APPROVALS

December 1, 1998

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MODULAR BUILDINGS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER

Champion Modular Restaurant, Inc. 12812 60th Street North Clearwater, FL 34620	Modular Drive/Thru Walk-Up Restaurant	930079-A
Fibrebond Corporation 1300 Davenport Drive Minden, LA 71055	Modular Building System Equipment Shelter	930005-A
Habersham Metal Products 264 Stapelton Road P.O. Box 739 Cornelia, GA 30531	Pre-Fab Metal Modular Cells	950030-A
Madison, Inc. 8500 New Sapulpa Road Tulsa, OK 74131	Modular Drive/Thru Walk-Up Restaurant	930061-A
Markline Industries, Inc. 14054 C.R.4, P.O. Box 271 Bristol, IN 46507	Relocatable Classrooms Model 2470 CR Model 2880 CR Model 2474 CR Model F4272C Relocatable Office Model 6060C Model 4860C Model F4272C	970060-A (Replaces 960063-A) 970057-A 970081-A 980058-A 970100-A 970101-A 980058-A
Sprung Structures,Inc. 6435 Castleway Drive W Suite 103 Indianapolis, IN 46220	Sprung Instant Structures Membrane Covered Frame Structures	940008-A
Steeltech Mfg.,Inc. 2700 W.North Avenue Milwaukee, WI 53208	Pre-Fab Metal Modular Modular Cell	950019-A
Math Starck & Sons, Inc. P.O. Box 37 Hales Corners, WI 53130	Relocatable Stor.Bldg. Donation Sheds	970097-A
Whitley Mfg. Co. 201 W. First St. South Whitley, IN 46787	Relocatable classroom Model 5353A Relocatable office Model 5418 Model 5384 Model 5524 Model 5537 Model 5538-44ft. Model 5540 Model 5539 Model 5573	980040-A 980042-A 980041-A 980063-A 980075-A 980076-A 980077-A 980078-A 980080-A

BLEACHERS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
DANT Clayton Corporation 1500 Bernheim Lane Louisville, KY 40210	ALUM-A-Stands Elevated 15 Row Bleacher System	980043-B (Replaces 920004-B)
The Folding Bleacher Co. P. O. Box 320 Altamont, IL 62411	Telescopic Bleachers	950066-B (Replaces 890018-B)
Hussey Seating, Inc. Dyer Street North Berwick, ME 03906	Telescopic Bleachers	950047-B (Replaces 890040-B)
Interkal, Inc. 5981 E. Cork Street Kalamazoo, MI 49041	3 to 12 Row Portable and 3 to 30 Row Forward Folding Bleachers	970063-B (Replaces 910092-B)
JW Industries, Inc. 5662 Glendale Avenue Green Bay, WI 54313	3 to 5-Row Portable Aluminum Bleacher Systems	940004-B
Midwest Bleachers, Inc. 6646 W. Fairview Avenue. Milwaukee, WI 53213	Tubular Type Steel Bleacher	960072-B (Replaces 900036-B)
National Recreation Systems, Inc. P.O. Box 11487 Fort Wayne, IN 46858	Alum & Galv Steel 5,8,10, 13,15,&20 Row Non- Elevated & Elevated Outdoor Bleacher Systems	930040-B

LABORATORIES

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Braun Intertec Corp. 5405 North Lagoon Avenue Portland, OR 97217-0126	Independent Testing and Certification Laboratory	950022-C (Replaces 890052-C)
Inchcape Testing Services NA, Inc. Industrial Park U.S. Route 11 Cortland, NY 13045	Independent Testing and Certification Laboratory	940032-C
Inchcape Testing Services NA, Inc (formerly) Warnock Hersey Int., Inc. 8431 Murphy Drive Middleton, WI 53562	Independent Testing and Certification Laboratory	950004-C
Factory Mutual Research 1151 Boston-Providence Turnpike Norwood, MA 02062	Independent Testing and Certification Laboratory	970024-C (Replaces 910120-C)

LABORATORIES

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Northwest Testing Lab	(See Braun Intertec Corp.)	
PFS Corporation 2402 Daniels Street Madison, WI 53704	Independent Testing and Certification Laboratory	960079-C Replaces (900058-C)
VTEC Laboratories, Inc. 212 Mandia Street Bronx, NY 10474	Independent Testing Lab	950017-C (Replaces 890056-C)
Warnock Hersey Int., Inc	(see: Inchcape Testing Services NA, Inc)	

DOORS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Won-Door Corporation 1865 S. 3480 West Salt Lake City, UT 84104	Automatic Closing Fire and/or Security Door	930049-D

FIRESTOPS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
A/D Fire Protection Systems, Inc. 420 Tapscott Road Scarborough, Ontario M1B 1Y4 Canada	A/D Firebarrier Firestopping Systems	940068-G
Insta-Foam Products, Inc. 1500 Cedarwood Drive Joliet, IL 60435	Insta-FireSeal Firestop Foam	940026-G (Replaces 880038-G)
Specified Technologies, Inc. 200 Evans Way, Suite 2 Somerville, NJ 08876	SpecSeal Putty, Sealant, Mortar and Collars Firestopping Materials and Devices	980038-G (Replaces 920078-G)
Tremco 3735 Green Road Beachwood, OH. 44122	TREMSTOP Through-Penetration Firestopping	980002-G (Replaces 940007-G)

HEATING/VENTILATING EQUIPMENT

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Direct Vent Sealed Combustion Chamber Appliances *		
Amana Heating & Air Conditioning, Inc. 1810 Wilson Parkway Fayetteville, TN 37334	Amana Central Furnaces GCD Series	960089-H(Revised)
	GUD Series	970091-H (Replaces 920027-H (Revised))
American Standard, Inc./ The Trane Company 2231 East State Street Trenton, NJ 08619	Direct Vent Forced Air Central Furnaces	940064-H
Armstrong Air Cond., Inc. 421 Monroe Street Bellevue, OH 44811	DVSCCA Gas Furnaces with Air Conditioning Trade Names: Armstrong American Aire, Johnson, Air-Ease	970069-H (Replaces 930083-H(Revised))
Bard Manufacturing Co. 1914 Randolph Drive Bryan, OH 43506	DVSCCA-Furnaces Models:DCC,DCH,DCL Series	980065-H (Replaces 920093-H)
Carrier: See United Technologies-Carrier		
Consolidated Industries Corp. P.O.Box 7800 Lafayette, IN 47903	Forced Air Furnaces	950057-H
Ducane Heating Division 118 West Main Street Blackville, SC 29817	Horizontal Forced Air Furnaces-Trade Names: Ducane, Intertherm ,Miller, Luxaire, York, Coleman, Home-Air, Pure-Temp, Winchester, and Moncrief	980026-H (Replaces 920021-H)
Evcon Industries, Inc. P.O. Box 19014 Wichita, KS 67204-9014	Direct Vent Forced Air Furnaces (Condensing Type)	930048-H
Goodman Mfg. Corp. 1501 Seamist Houston, TX 77008	DVSCCA Gas Furnaces Trade Names: Janitrol, GMC, Kenmore	950058-H(Revised) (Replaces 920054-H)
International Comfort Products Co. 650 Heil-Quaker Ave. P.O. Box 0128 Lewisburg, TN 37091-0128	DVSCCA Furnaces Trade Names: Arco/Comfortmaker , Heil, Kenmore & Tempstar	970075-H (Revised) (Replaces 950067-H)

***See the separate list "Direct Vent Sealed Combustion Chamber Appliances" or a copy of the manufacturers material approval for model numbers of approved appliances.**

Direct Vent Sealed Combustion Chamber Appliances *

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Inter-City Products see: International Comfort Products		
Lennox Industries, Inc. W229 N1844 Westwood Dr. Waukesha, WI 53186	Direct Vent Forced Air Furnaces	980033-H (Revised) (Replaces 920043-(Rev.3))
Modine Mfg. Co. 1500 DeKoven Avenue Racine, WI 53403	Direct Vent Unit Heaters Models: PSH & BSH Series	970018-H (Replaces 910060-H)
Nordyne, Inc. 1801 Park 270 Drive St. Louis, MO 63146-4020	Direct Vent Forced Air Furnaces Trade Name: Nordyne, Miller and Intertherm G3RCO.G5RC Series	970031-H (Replaces 930078-H and 950031-H)
Reznor, A Unit of Thomas & Betts McKinley Avenue Mercer, PA 16137	Duct Furnaces & Unit Heaters Reznor SC-Series	940013-H (Replaces 880042-H)
Rheem Mfg. Co. Air Conditioning Division P.O.Box 17010 Fort Smith, AR 72917-17010	Direct Vent Forced Air Furnaces, Trade Name: Rheem, Ruud Nordyne, Weatherking and Heat Controller	980036-H (Replaces 940053-H(Rev.3))
Skymark Inc. P.O. Box 536 Cobourg, Ontario, Canada K9A 4L3	Direct Vent Furnace/ A.C.	950073-H
Sterling Radiator Division South Fields Street P.O. Box 809 Farmville, NC 27828	Duct Furnaces and Low/High Static Unit Heaters, including separated combustion equipment	960002-H (Replaces 920105-H)
Thermo Products, Inc. 5235 W. State Rd. 10 North Judson, IN 46366	Direct Vent Forced Air Central Furnace	970104-H (Replaces 960011-H)
The Trane Company 2231 E.State St. Trenton, NJ 08619	Direct Vent Forced Air Furnaces, Trane TD and AD, AU, TD, TU Series	980029-H (Replaces 920072-H)
See Also: American Standard,Inc./The Trane Co.		
United Technologies-Carrier 7310 W. Morris Street Indianapolis, IN 46231	Carrier 58 & 490 Series Bryant, Day and Night, and Direct Vent Furnaces	970010-H (Replaces 910115-H) Rev.)
York International Corp. Central Environmental Systems P.O. Box 1592, 232F York, PA 17405-1592	Forced Air Furnaces PA, PB,PC ,P1, P2, P3 Series	960062-H (Rev.) (Replaces 940043-H)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Direct Vent Sealed Combustion Chamber Appliances *		
American Water Heater Co. Oakland & E. Fairview Ave. Johnson City, TN 37605	DVSCCA Gas Water Heater Integra, MOR-FLO, U.S., American, Craftmaster, Polaris & Bradford-White	970016-H (Revised) (Replaces 910117-H Rev. 4)
A.O. Smith Water Products U.S. Hwy 1 N P.O. Box 187 McBee, SC 29101	Hot Water Heaters and Boilers	950042-H(Revised) (Replaces 930070-H)
	Water Heaters	960044-H (Revised) (Replaces 940081-H)
A.O. Smith Water Products 401 Frederick Rd. El Paso, TX 79905	Dual Use Hot Water Supply Boilers	970089-H
Aerco International 159 Paris Avenue Northvale, NJ 07647	KC-1000 Water Heater and Boiler	960025-H (Replaces 900041-H)
	Benchmark Hot Water Boiler	980079-H
Burnham Corporation Hydronics Division P.O. Box 3079 Lancaster, PA 17604	Direct Vent Gas Boiler Spirit & Minuteman	960009-H (Replaces 940042-H)
	Revolution Series	980059-H
	Evolution Series	980083-H
Fulton Thermatec Corp. P.O. Box 257 Pulaski, NY 13142	Gas-Fired Boilers	970001-H (Replaces 910097-H)
Heat Transfer Products, Inc. 120 Braley Road East Freetown, MA 02717	Gas Water Heaters	950063-H(Revision #2)
Hamilton Engineering	see Lochinvar	970085-H
The Hydrotherm Corp. 260 North Elm Street Westfield, MA 01085	Multi-Pulse Boilers	940023-H (Replaces 880020-H)

(Heating/Ventilating Equipment)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Direct Vent Sealed Combustion Chamber Appliances *		
Lennox Industries, Inc. P.O. Box 118077 Carrollton, TX 75011-877	Dual Use	970082-H (Replaces 950008-H)
Lochinvar Corporation 2005 Elm Hill Pike Nashville, TN 37210	Water Heaters, Hot Water Boilers and Pool Heaters	940035-H (Revision 2)
	Copper-Fin II Series Hamilton Cross Reference No's.	970085-H
	PBN Hot Water Boilers	980100-H
Monitor Products, Inc. P.O.Box 3408 Princeton, NJ 08543	Dual Use Water Heater	970056-H(Revised)
Patterson-Kelley Division 100 Burson St. P.O. Box 458 East Stroudsburg, PA 18301	Hot Water Boilers Trade Name: Thermific	960049-H
The Peerless Heater Co. 231 N.Walnut St. Byertown, PA 19512	Water Heaters	970092-H
P.V.I. Industries, Inc. P.O. Box 7124 Fort Worth, TX 76111	DVSCCA Water Heaters and Boilers Maxim, Power VT & Turbopower	970066-H (Replaces 960006-H)
Raypak, Inc. 31111 Aqoura Rd. Westlake Village, CA 93021	Raypak "Dual Use" Gas-fired Boiler & Water Heaters, ADB (-500 & -750)	980073-H
Rheem Manufacturing Co. Water Heater Division 260 Gunter Park Drive E. Montgomery, AL 36109-1413	Water Heaters	980064-H (Replaces 920124-H)
RECO Industries, Inc. 1839 Dunbar Road Cavce, South Carolina 29033	Elite Water Heaters, R Series	960093-H
Slant/Fin Corp. 100 Forest Drive Greenval, NY 11548	Gas Boiler: Slant-Fin KC Series	960008-H
	Concept 21 CB Series	960086-H

(Heating/Ventilating Equipment)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Direct Vent Sealed Combustion Chamber Appliances *		
State Industries, Inc. 500 By-Pass Road Ashland City, TN 37015	Gas Water Heaters Trade Names: Apollo, Censible, Dixie, Reliance Super Saver Quick Recovery State Super Saver Quick Recovery	980031-H(Revised) (Replaces 920038-H)
Teledyne Laars 20 Industrial Way Rochester, NH 03867	Gas-Fired Water Heater *Mini-Therm JVI & II Boilers *Mighty Therm Boiler	980048-H 980090-H 980091-H
Trianco-Heatmaker, Inc. 111 York Avenue Randolph, MA 02368	DVSCCA Boilers & Hot Water Heaters Heatmaker, Advantage 96	970012-H (Replaces 910004-H Revised)
Utica Boiler, Inc. 2201 Dwyer Avenue Utica, NY 13501	Hot Water Boilers SC Series	970106-H
Vaillant Corp. 2607 River Road Cinnaminson, NJ 08077	Gas-Fired Boilers GA100 SC Series	960074-H
Weben-Jarco, Inc. 4007 Platinum Way Dallas, TX 75237	Hot Water Boilers VJHWB-75,100 Series	970054-H(Revised)
Weil-McLain/ A United Dominion Co. 500 Blaine Street Michigan City, IN 46360	Gas Boiler	960019-H (Replaces 900042-H)
Make-Up Air Heaters (Tested to ANSI Z83.4)		
Aerovent, Inc. 5959 Trenton Lane Plymouth, MN 55442-3238	Direct Fired Make-Up Air Heaters	980027-H (Replaces 920104-H)

*NOT A DVSCCA APPLIANCE

(Heating/Ventilating Equipment)

	MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Make-Up Air Heaters (Tested to ANSI Z83.4)			
	Hastings Industries, Inc. P.O. Box 548 Hastings, NE 68902	Direct Natural Gas-Fired Make-Up Air Heaters	960020-H (Replaces 900026-H)
*	Rapid Engineering, Inc. 1100 Seven Mile Road P.O. Box 700 Comstock Park, MI 49321-0700	Direct Gas-Fired Make-Up Air Heaters and Direct Gas-Fired Industrial Air Heaters	930052-H
*	Reznor, A Unit of Thomas and Betts McKinley Avenue Mercer, PA 16137	Direct Gas-Fired Make-Up Air Heaters and Direct Gas-Fired Industrial Air Heaters	970044-H (Replaces 930072-H)
	Rupp Industries, Inc. 11550 Rupp Drive Burnsville, MN 55337	Direct Natural Gas-Fired Make-Up Air Heaters RAM Series	980088-H (Replaces 920032-H)
		In-Direct Gas-Fired Make-Up Air Heating Equipment	980047-H
	The King Company 1001 21st Avenue NW P. O. Box 287 Owatonna, MN 55060	Gas- and Oil-Fired Heating Equipment (Direct and Indirect)	950012-H (Replaces 890062-H)
	Weather-Rite , Inc. 616 North Fifth Street Minneapolis, MN 55401	Direct Fired Heaters	960039-H (Replaces 900020-H)
Direct Fired Unvented Heaters (Tested to ANSI Z83.18)			
	Bananza Air Mgt. Sys. Inc. 5320 52nd Street, SE Kentwood, MI 49512	Direct Gas-Fired Industrial Heaters	970032-H (Replaces 910034-H)
	Cambridge Engineering, Inc. P.O.Box 1010 Chesterfield, MO 63006	Direct Gas-Fired Industrial Air Heaters	950041-H
	Industrial Airsystems, Inc. 2475 Doswell Avenue St. Paul, MN 55108	Direct Fired Heaters	960036-H (Replaces 900034-H)

*** These units were also tested to ANSI Z83.18.**

(Heating/Ventilating Equipment)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Direct Fired Unvented Heaters (Tested to ANSI Z83.18)		
Rupp Industries, Inc. 11550 Rupp Drive Burnsville, MN 55337	Direct Natural Gas-Fired Make-Up Air Heaters RAM Series	980088-H (Replaces 920032-H (Revised))
Titan Air, Inc. 622 16th Street P. O. Box 295 Osseo, WI 54758	Direct Gas-Fired Industrial Air Heaters, TA Series	940079-H (Replaces 890065-H)
Ductless Fans		
Broan Mfg. Co., Inc. 926 W. State St. Hartford, WI 53027	Broan Duct-Free Fan Model #686 and #686SF	980044-H (Replaces 920006-H)
NuTone, Inc. Madison & Red Bank Roads Cincinnati, OH 45227	Model C305C3 and Model F305C3	980039-H (Replaces 920003-H)
Waste Oil Heaters		
Black Gold Corporation 240 Great Circle Road Nashville, TN 37228	Waste Oil Central Furnaces Waste Oil Heaters with AG Tank	980084-H (Replaces 920075-H)
Clean Burn, Inc. 83 S. Groffdale Road Leola, PA 17540	Multi-Oil Boilers, Unit Heaters and Central Furnaces	950039-H
Lenan Corporation 4109 Capitol Circle Janesville, WI 53546	Lanair Waste Oil Heaters	950016-H (Revision #2) (Replaces 940006-H)
Reznor/Thomas & Betts McKinley Av. Mercer, PA 16137	Waste Oil Unit Heaters	960055-H

(Heating/Ventilating Equipment)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Waste Oil Heaters		
Shenandoah Mfg. Co., Inc. 1070 Virginia Avenue P.O. Box 839 Harrisonburg, VA 22801	Multi-Oil Fire Warm Air Furnaces,Hot Water Boilers, Water Heaters, and Gun Type Burner	950040-H (Replaces 910082-H)
Thermo Cycler Industries,Inc P.O. Box 22. Union Mills, IN 46382	Gas/Oil Fired Unit Heater (Floor mounted)	970105-H
Induced Draft Fans		
The Field Controls Co. 2308 Airport Road Kinston, NC 28501	Power Venters and Accessories	950046-H (Replaces 890025-H)
Miscellaneous		
Ballantyne of Omaha, Inc. 4350 McKinley Street Omaha, NE 68112	Self-Contained Pressure Fryer	950005-H (Replaces 890064-H)
Empire Comfort Systems 918 Freeburg Avenue Belleville, IL 62222	DV Series Furnace (Note: Empire units are not sealed combustion chamber appliances.)	940074-H(Revised)
Gary Steel Products Corp. 2700 East 5th Avenue Gary, IN 46402	PVC-Coated Duct System	930027-H
Garmat USA, Inc. 1401 W. Stanford Av. Englewood, CO 80110	Closed Top Open Face Paint Spray Booths w/Plastic Curtain	980070-H
Giles Enterprises, Inc. 2750 Gunter Park Dr.W Montgomery, AL 36109	Ductless Hoods	960042-H
Goodman Mfg. Corp. 1501 Seamist Houston,TX 77008	DV & Non-DV Series Furnaces	950058-H (Replaces 920054-H)
I.C.E. Manufacturing Ltd. 51 Aikens Street Winnipeg, Manitoba, Canada R2W 4E3	Industrial & Commercial Central Furnaces and Duct Furnaces	930082-H

(Heating/Ventilating Equipment)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Miscellaneous		
Master Air Div. of Apex Ventilating Co. 5940 Michigan Road NW Indianapolis, IN 46208	Heat Recovery Module Kitchen Hood Heat Recovery System	980094-H
Motion Technology, Inc. 12 Tech Circle Natick, MA 01760	Auto Fry FFG-10 Self-Contained Fryer	970103-H
Reznor, A Unit of Thomas & Betts McKinley Av. Mercer, PA 16137	Gas-Fired Low Static Unit Heaters SFT Series FT Series	 970102-H 980089-H
Suburban Mfg. Co. 676 Broadway St., P.O. Box 399 Dayton, TN 37321	DV Wall Furnace	970049-H
Therm-O-Manufacturing,Inc. 2217 Columbus Road, N.E. Canton, OH 44705	Therm-O-Pan Return Air Panning	940029-H
Z-Flex U.S., Inc. 20 Commerce Park North Bedford, NH 03110	Chimney & Vent (Type "B") Flexible Connector & Accessories	930055-H

INSULATION PRODUCTS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
AAB Building System 840 Division Street Cobourg, Ontario Canada K9A 4J9	Insulating Concrete Formwork	940066-I
AFM Corporation 24000 West Hwy 7, Suite 201 Excelsior, MN 55331	R-Control Panel	930011-I
Advanced Insulation Concepts, Inc. 8055 Production Avenue Florence, KY 41042	Isowall Insulated Panels & Liners	970061-I (Replaces 910094-I)
Alply, Inc. Box 538 Highway 16, West DeKalb, MS 39328	Alply Curtainwall	930018-I

INSULATION PRODUCTS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Airlite Plastics Co. 914 N.18th St. Omaha, NE 68102	Reward Wall Systems® Insulated Concrete Systems	980093-I
Aluma Shield Ind., Inc. 405 Fentress Boulevard Daytona Beach, FL 32114	Aluma Shield Metal Panels	970052-I (Revised) (Replaces 920100-I)
American Conform Ind., Inc. 1820 S. Santa Fe Street Santa Ana, CA 92705	Conform Expanded Polystyrene Blocks	980020-I (Replaces 920083-I)
Armstrong World Industries, Inc. P.O. Box 3213 Lancaster, PA 17604	Armaflex Pipe Insulation ,	970021-I (Replaces 910040-I)
Atlas Roofing Corp. 1775 The Exchange, Suite 160 Atlanta, GA 30339	Premium Flat Felt Shingle Underlayment	980014-I
The Celotex Corporation P.O. Box 31602 Tampa Bay, FL 33631	Tuff-R Insulating Sheathing	950034-I (Replaces 940030-I)
	Thermax Insulation Board	950026-I (Replaces 890011-I)
Certainteed Corporation 750 East Swedesford Road Valley Forge, PA 19482-0105	FlameChek Duct Insulation	970093-I
Coldmatic Building Systems 8500 Keele Street Concord, Ontario Canada L4K 2A6	Polyurethane Sandwich Panels	940027-I
Corbond Corporation 32404 East Frontage Road Bozeman, MT 59715	Corbond II Spray-Applied Polyurethane Insulation	980062-I
Crown Fixtures, Inc. 10700 Highway 55, Suite 160 Plymouth, MN 55441	Crown Walk-In Coolers and Freezers	960028-I
Dow Chemical 3825 Columbus Road SW Granville, OH 43023	Styrofoam Deckmate Roof Insulation	960004-I
	Rigid Cellular	970076-I

(Insulation Products)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Dryvit Systems, Inc. P.O. Box 1014 One Energy Way West Warwick, RI 02893	Exterior Insulation System	930024-I
	Ultralation Exterior Insulation & Finish System	960069-I (Replaces 900057-I)
	Sprint Exterior Insulation & Finish System	960012-I (Replaces 900052-I)
	Exterior Insulation & Finish Systems Residential MD & Sprint MD	970084-I
Enercept, Inc. Building Systems 3100 9th Avenue S.E. Watertown, SD 57201	Enercept Building System	940039-I
EPS Molders Association 1926 Waukegan Road, Suite #1 Glenview, IL 60025	Expanded Polystyrene Roof Insulation	960061-I
Energy Panel Structures, Inc. P. O. Box 238 Graettinger, IA 51342	Insulation Panels	980008-I (Replaces 920007-I)
	Energy-Lok Panels	960092-I (Replaces 890028-I)
Environmentally Safe Products ,Inc. 313 W. Golden Lane New Oxford, PA 17350	Low-E Insulation	970086-I
Featherlite, Inc. 3231 Bryson Drive Florence, SC 29501	8" x 8" x 16" Polyurethane Building Block Wall Systems	940019-I
GREENBLOCK™ Worldwide Corp. P.O.Box 749 Woodland Park, CO 80866	Insulated Concrete Formwork EPS-ICF	970088-I
Icynene, Inc. 376 Watline Avenue Mississauga, Ontario Canada L4Z 1X2	Icynene Foam Plastic Insulation	960080-I
Knauf Fiber Glass One Knauf Drive Shelbyville, IN 46176	Fiber Glass Residental Batt, Blanket, and Loose Fill Insulation Products	980034-I
Kysor/Kalt Refrigeration 3620 West McGill South Bend, IN 46628	Kysor// Kalt	940059-I (Revised)

(Insulation Products)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Laminators Incorporated 3195 Penn. Avenue Hatfield, PA 19438	Omega-Ply FRC, Omega-Foam Ply FRC, and Omega-Bond FRC Building Panels	940058-I
Master-Bilt Products Highway 15, North New Albany, MS 38652	MasterBilt Foam Plastic Sandwich Panels	960083-I (Replaces 910091-I)
Metl-Span Corp. 1497 N. Kealy Lewisville, TX 75067	Metl-Span III Panel	950054-I (Replaces 900005-I)
	Metl-Span IV Panel	970008-I (Replaces 910057-I)
NRG Barriers 27 Pearl Street Portland, ME 04101	Polyisocyanurate Insulation Products	950049-I
Owens Corning Specialty & Foam Products 275 Soutwest Avenue Tallmadge, OH 44278	Foamular Thermapink Extruded Polystyrene Roof Insulation	960076-I
Parex, Inc. P.O. Box 189 1870 Stone Mountain-Lithonia Rd Redan, GA 30074	Parex EIFS	960047-I (Replaces 890053-I)
	Parex Insul/Crete EIFS	960088-I (Replaces 900028-I)
Plymouth Foam Products 1800 Sunset Drive Plymouth, WI 53073	Polytec Brand EPS	960017-I
Polycrete Industries, Inc. 7390 Henri-Boorassa Blvd. East Anjou, Quebec H1E 1P2 Canada	Polycrete Stay-in-Place Concrete Forms	950044-I
Polyfoam Packers Corp. 2320 Foster Avenue Wheeling, IL 60090	Direct Deck EPS Roof Insulation	950029-I
Polyfoam Packers Corp. Construction Products Division 3751 Sunset Avenue Waukegan, IL 60087	ThermoSafe EPS Roof Insulation	960041-I
Polymaster of WI 909 Blackstone Ave. Waukesha, WI 53186	Foam Plastic Insulation	970098-I (RESCINDED)

(Insulation Products)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Resin Technology Company 2270 Castle Harbor Place Ontario, CA 91761 (Montana Urethane Systems, App.)	RT-2041 Spray-Applied Polyurethane Insulation	980057-I
Retro Tek / Exel, LLC 3865 Hoepker Road Madison, WI 53704	Retro Tek Exterior Insulation & Finish System	960084-I (Replaces 920011-I)
Reynolds Metals Company P.O. Box 4129 One Industrial Park Eastman, GA 31023-4129	REYNOBOND FR & PE Aluminum Exterior & Interior Composite Building Panels	930066-I (Replaces 920019-I)
Robertson A United Dominion Co. 400 Holiday Drive Pittsburgh, PA 15220	Formawall 2000 & 3000 and Alumacore Panels	940021-I (Replaces 880046-I)
Simplex Products Division P.O. Box 10 Adrian, MI 49221	Finestone Wall Surfacing System	930029-I
Smith Steelite 1005 Beaver Grade Road Moon Township, PA 15108	Foamwall	940011-I
STO Industries Div. of STO Corp. 6175 Riverside Drive Atlanta, GA 30331	Exterior Insulation & Finish System STO PI System	960010-I (Replaces 900053-I)
	Toughwall System	950027-I (Replaces 890017-I)
	R-Wall Ext. Insul. & Finish System	940009-I (Replaces 880003-I)
	STO External Insul. & Finish System	930012-I
TEC Inc., an H. B. Fuller Co. 315 S. Hicks Road Palatine, IL 60067	Exterior Insulation & Finish System	950028-I (Replaces 890007-I)
Thermal Corp. of America Rt. #3, Hwy. 34, West Mount Pleasant, IA 52641	Thermco Foam Insulation	970022-I (Rev.) (Replaces 910002-I)

(Insulation Products)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Thermal Ceramics P.O. Box 923 Augusta, GA 30903	Firemaster Duct Wrap, Bulk and Putty	940038-I
Thermalrite Refrigeration Mfg., Inc. 6514 East 26th Street Commerce, CA 90040	Modular Cold Storage Room & Panels	960065-I
Therm-L-Tec Systems, Inc. 119 Osage Avenue Kansas City, KS 66105	Insulation Panel System	980095-I
Unifrax Corporation 2351 Whirlpool Street Niagara Falls, NY 14305	Fyrewrap Duct Insulation	960068-I
Universal Polymers, Inc. 319 North Main Street Springfield, MO 65806	ThermatexPlus Exterior Insulation & Finish System	960067-I (Replaces 900029-I)
Wisconsin EPS, Inc. 90 Trowbridge Drive P.O.Box 669 Fond du Lac, WI 54936	Perform Protect EPS Roof Insulation	950015-I
	Perform & Contour Taper Tile EPS Roof Insulation	960034-I
	R-Control Fire Class Panel	960045-I
Zer-O-Loc Enterprises, Ltd. 4740 Vanguard Road Richmond, British Columbia Canada V6X 2P8	Zer-O-Loc Sandwich Panels and Doors	930044-I

CHIMNEY LININGS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
North American Supaflu Systems,Inc. 15 Holly Street, U203 Scarborough, ME 04074	Supaflu Chimney Lining System	940016-J (Revised)

MASONRY CEMENTS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Conproco Corporation P.O. Box 16477 Hooksett, NH 03106	Structural Skin Surface Bonding Cement and Dampproofing Foundation Coat	930063-K (Replaces 910116-K)
Lafarge Corporation Ford Avenue Alpena, MI 49707	Lafarge Masonry Material Mortar Cement Type N and Type S	930045-K
Quikrete Corporation 1790 Century Circle Atlanta, GA 30345	Surface Bonding Cement & Fiberglass Reinforced Stucco	960048-K (Replaces 900043-K)
W. R. Bonsal Company P.O. Box 241148 Charlotte, NC 23224	Surewall Surface Bonding Material	930023-K

LIGHT TRANSMITTING PLASTICS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Cemcel Corporation 1091 Essex Avenue Richmond, CA 94801	Cemcel II, Type 300 and 300a Light Transmitting Plastic Panels	930065-L
CYRO Industries 25 Executive Boulevard Orange, CT 06477	Acrylite®,Cyrolon®, Exolite®,& Cyroflex® Light Transmitting Plastic Sheet	950043-L
DSM Eng.Plastics, Inc. Sheffield Plastic 119 Salisbury Road Sheffield, MA 01257	Light-Transmitting Plastic & Safety-Rated Glazing Panels	960078-L
G.E. Plastics One Plastics Avenue Pittsfield, MA 01201	Lexan ®,Lexgard® & Lexan Thermoclear Sheets-Light-Transmitting Plastic & Safety -Rated Glazing Panels	940040-L
Glasteel Tennessee, Inc. Highway 57, East P. O. Box 521 Collierville, TN 38017	Fiberglass Reinforced Light Transmitting Plastic	950003-L (Replaces 890026-L)
Kalwall Corporation 1111 Candia Road Manchester, NH 03105	Composite Structural Panel	930009-L

LIGHT TRANSMITTING PLASTICS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Major Industries P.O. Box 306 Wausau, WI 54401	Guardian 275 Translucent Panel	970003-L (Replaces 910074-L)
Polygal U.S.A., Inc. 2352 Highway 14 West Janesville, WI 53547	Polycarbonate Structured Sheet	950052-L (Replaces 900045-L)
Sheffield Plastics Skywall, Inc. 2311 E. 28th Street Chattanooga, TN 37407	see DSM Eng.Plastics, Inc. Transluscent Plastic Panels	940002-L (Replaces 880052-L)

METAL BUILDINGS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
A & S Building Systems Inc. Old Highway 25W P.O. Box 53 Caryville, TN 37714	Metal Buildings LT, SS, TB, RF, RFC Series	970035-M (Replaces 910079-M)
American Buildings Company State Docks Road P. O. Box 800 Eufaula, AL 36027	Pre-Engineered Metal Building Systems	960032-M (Replaces 900007-M)
Behlen Manufacturing Co. P.O. Box 569 Columbus, NE 68601	ADS Frame Systems	930039-M
	CONVEX/DBL PNL Roof Systems	930038-M
Butler Manufacturing Co. 1020 S. Henderson Street Galesburg, IL 61401	MODULAR Metal Bldg. Sys. MRF II, MRDS, MRST & MRSS	970014-M (Replaces 910112-M)
	Landmark Building Systems	930032-M
	WX II Systems	960021-M (Replaces 900011-M)
	CLEARSPAN Building Systems LRF, LRDS, LRST & LRSS	970013-M (Replaces 910111-M)
Butler Manufacturing Co. Building Division P.O. Box 917 Kansas City, MO 64141	Delta Joist Roof Systems	930008-M

METAL BUILDINGS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Chief Industries, Inc. P.O. Box 2078 Grand Island, NE 68802	Metal Building Systems	970002-M (Replaces 910009-M)
Epic Building Systems, Inc. 510 Commercial Avenue Sun Prairie, WI 53590	Light-Gauge Steel Roof Trusses	970025-M
	Light-Gauge Steel (open web box) Floor Trusses	970071-M
Germantown Iron & Steel Corp. W.169 N. 11055 Kleinmann Dr. Germantown, WI 53219	Steel Frame Home ("The Lexington"/New World Home	960081-M
Kirby Building Systems, Inc. Kirby Drive P. O. Box 390 Portland, TN 37148	Metal Building Systems	960035-M (Replaces 900001-M)
Miracle Steel Corp. 600 Oakwood Road P.O. Box 1266 Watertown, SD 57201	Pre-Engineered Metal Building System	960031-M (Replaces 900013-M)
N. C. I. Building Systems, L.P. 7301 Fairview Houston, TX 77041	Pre-Engineered Metal Building Systems	950075-M
New World Homes, Inc.	see: Germantown Iron & Steel Corp.	
Nucor Building Systems 305 Industrial Parkway P.O. Box 70 Waterloo, IN 46793	Pre-Engineered Metal Building Systems (TB, RF, RFC)	980028-M (Replaces 920060-M)
Star Building Systems, a Robertson CECO Co. P.O. Box 94910 Oklahoma City, OK 73143	STR, STB, SMT, SMS, SRLO SRHI, SWE & SSB Series Pre-Engineered Metal Building Systems	940037-M (Replaces 900008-M and 880006-M)
Steelox Systems, Inc. 5412 Course View Drive P.O.Box 8181 Mason, OH 45040-8181	Steelox Metal Building Systems	980022-M
United Structures of America, Inc. P.O. Box 605 Portland, TN 37148	Metal Buildings RF, BC, SC, SCSS, LT	960007-M (Replaces 900060-M)
Varco Pruden 273 Water Street Evansville, WI 53536	Pre-Engineered Metal Building Systems	960026-M (Replaces 900012-M)

METAL CONNECTOR PLATES FOR WOOD TRUSSES

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Alpine Engineered Products, Inc. P.O. Box 2225 Pompano Beach, FL 33061	16, 18 & 20 Gauge Metal Connector Plates	970053-N (Replaces 930033-N)
Eagle Metal Products, Inc. P.O. Box 1267 Mabank, TX 75147	20, 18 and 16 Gauge Truss Connector Plates	930031-N
Jager Industries Inc. 8835 Macleod Trail S.W. Calgary, Alberta, Canada T2H OM3	SK-20 18, & 20 Gauge Truss Connector Plates	950072-N (Replaces 940072-N)
KEY/PAX 4401 West Roosevelt Road Chicago, IL 60624	16 and 20 Gauge Connector Plates	930034-N (Replaces 900002-N)
Mitek Industries, Inc. P.O. Box 7359 St. Louis, MO 63177	Truss Connector Plates M, MII, 20HS Series	970036-N (Replaces 910080-N and 930013-N)
Morton Building, Inc. 252 West Adams Street Morton, IL 61550	18 and 20 Gauge Metal Connector Plates	930016-N
Robbins Mfg., Co. P.O. Box 17939 Tampa, FL 33682	Robbins Lock (RL), and (RHS) 20 Gauge Truss Connector Plates	970099-N (Replaces 940003-N)
Simpson Strong-Tie Co. 1450 Doolittle Drive P.O. Box 1568 San Leandro, CA 94577	Metal Connectors and Hangers	940017-N (Replaces 880031-N)
Tee-Lok Corporation P.O. Box 585 Edenton, NC 27932	Metal Connector Plates	970050-N (Replaces 950076-N
Trussteel, Inc 6664 96th Avenue Zeeland, MI 49464	16, 18, 20 Gauge Metal Connector Plates	930001-N
Truswal Systems Corporation 1101 North Great Southwest Arlington, TX 76011	TW-16, TW-20 and R5000 Metal Connector Plates	930002-N
United Steel Prod.,Co. 703 Rogers Dr. P.O. 80 Montgomery, MN 56069	Kant-Sag Metal Connector Plates	970068-N

MISCELLANEOUS APPROVALS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Alucobond Technologies, Inc. P.O Box 507 Symsonia Rd. Benton, KY 42025	Composite Aluminum & Polyethylene Panel	960056-O
Allied Building Products Corp.	see: Group Seribo/Seripanneaux	
American Flamecoat, Inc. 10100 Park Cedar Drive, Suite 134 Charlotte, NC 28210	FlameCheck Fire Retardant Treatments	950071-O
Bella Bagno, Inc. 5520 W. Touhy Avenue Unit E Skokie, IL 60077	Hygolet Sanitary Toilet Seat	970000-O (Replaces 910030-O)
Celotex Corporation P.O. Box 31602 4010 Boy Scout Boulevard Tampa, FL 33631	Protectone Acoustical Ceiling Material	960018-O (Replaces 900069-O)
CENTRIA 1005 Beaver Grade Rd. Moon Township, PA 15108	FORMAWALL 1000V& 1000H Wall Panels	980087-O
CertainTeed Corporation Pipe & Plastic Group P.O. Box 860 Valley Forge, PA 19482	Form-A-Drain Footing Form & Foundation Drainage System	980101-O (Replaces 930053-O (Rev.2))
CertainTeed Corporation Roofing Products Group P.O. Box 1100 Blue Bell, PA 19422	Hallmark Shangle Organic Asphalt Shingle And Roofers' Select High- Performance Underlayment	960066-O
Chemical Specialties,Inc. One Woodlawn Green Charlotte, NC 28217	ACQ Type B & Type D Wood Preservative Treatment	940070-O
CraftBilt Mfg. Co. 53 Souderton-Hatfield Pike Souderton, PA. 18964	Betterliving Patio Room Enclosure System	960077-O
E-Z Taping System, Inc. 2200 Riverside Drive Green Bay, WI 54301	E-Z Fire Tape Drywall Joist Tape	950065-O
FABRAL P.O. Box 4608 Lancaster, PA 17604	Light-Gauge Steel Diaphragm Sheeting	950061-O

(Miscellaneous Approvals)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Fibermesh, Division of Synthetic Industries 4019 Industry Drive Chattanooga, TN 37416	Fibermesh Fibers Renifor.for Conc.	950070-O
Flexible Products Co. 2050 North Broadway Joliet, IL 60435-3187	Polyurethane Roof Tile Adhesive	970107-O
	Insta-Stik Roof Adhesive	980032-O
GAF Materials Corporation 1361 Alps Road Wayne, NJ 07470-3689	Shingle-Mate® Roofing Underlayment	980046-O
The Glidden Co. 3121 Butterfield Road Oak Brook, IL 60521	Insul-Aid Vapor Barrier Paint	950036-O
Grace Construction Prod. Composite Technology 1005 Blue Mound Road Fort Worth, TX 76131	Tuff Spane FRP Panels	940075-O
Group Seribo/Seripanneaux Route deNajauge-Branche Panneaux 08320 Hierges, France	Cement Bonded Particle Board	950068-O
Hallman Lindsay Quality Paints 501 South Bird Street P. O. Box 109 Sun Prairie, WI 53590	#530 Insul Kote Latex Vapor Barrier Paint	950006-O (Replaces 920102-O)
Hartford Conservatories, Inc. 96A Commerce Way Woburn, MA 01801	Patio Room Enclosure System	960058-O
Granite City Steel Co. 20th & State Streets Granite City, IL 62040 Distributee: Hartje Lumber, Inc. E4525A Schuette Rd. LaValle, WI 53941	Light-Gauge Steel Diaphragm Sheeting	970009-O (Replaces 910010-O)
Hoffer's Inc., Coating Div. 310 Bellis Street Wausau, WI 54401	Hoffer #8230 Moisture Vapor Barrier Paint	940005-O
International Visual Corp. 1 Harbor Park Drive Port Washington, NY 11050	I.V. Extruded Slatwall Decorative Foam Plastic Panels	960064-O

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Johns Manville International, Inc. P.O. Box 5108 Denver, CO 80217	Waterproofing Membranes Sure Grip, Nordshield,Roof Defender & Nordtene	970065-O
King & Company Box 10 Clarksville, AR 72830	E.P.S. Drop-Out Ceiling Tiles	970006-O (Replaces 910007-O)
Mautz Paint Company 939 E. Washington Avenue Madison, WI 53703	Mautz 3740-S Vapor Barrier Paint	940010-O (Replaces 880027-O)
Mobil Chemical Co. 158 Capitol Lane Winchester, VA 22602	Wood-Polymer Composite Lumber	950025-O
Nippon Elec. Glass Co., Ltd. 1-14 Miyahara 4-Chome, Yodogawa - KU Osaka, Japan 532	FireLite Fire-Rated Glazing Material	930064-O (Replaces 900022-O)
Poly-Wall International, 941 Hillwind Road N.E. Suite 100 Fridley, MN 55432	Poly-Wall Coating Material	930069-O
RM Base Company 145 West Swallow Road Fort Collins, CO 80525	Scapewel Window Well System	970094-O
The Sherwin-Williams Co. 101 Prospect Avenue Cleveland, OH 44104	ProMar Vapor Barrier Paint	950020-O
	Vapor Barrier Paint-Sand Finish	960059-O
Simplex Products Division P.O. Box 10 Adrian, MI 49221	Thermo-Ply Sheathing	960071-O (Replaces 900027-O)
Smoke Guard Corporation 2004 North 10th Street Boise, ID 83702	Smoke Guard Smoke Containment System	940049-O
Somerset Plastics P.O. Box 1163 Somerset, KY 42502	EPS Drop-Out Ceiling Tiles	970055-O (Replaces 910032-O)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Sto Industries Division of Sto Corp. 6175 Riverside Drive, SW Atlanta, GA 30331	Decocoat-X Interior and Exterior Finish	940045-O
Tamms Industries 7405 Production Drive Mentor, OH 44060	Tamoseal Waterproofing Finish Material	960040-O
Temo Incorporated 20400 Hall Road Clinton Township, MI 48038	Aluminum Frame Patio Enclosure System "Country Rooms"	930006-O
The Valspar Corp. 1191 Wheeling Rd. Wheeling, IL 60090	Prepstep Int.Vapor Block Primer #991	970080-O
W. R. Grace and Company 62 Whittemore Avenue Cambridge, MA 02140	Grace Fiber and Microfiber Reinforcement for Concrete	950010-O (Replaces 890058-O)
Wheeling Corrugating Co. 1134 Market St. Wheeling WV 26003	Light-Gauge Steel Panel & Diaphragm Panel	970072-O

PRECAST CONCRETE

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Concepts In Concrete W339 S5524 Woodland Wonderland Court Eagle, WI 53119	Del Zotto Precast Concrete Floor and Wall Panels	930054-P
County Prestress Corp. 1111 Menomonie Street Eau Claire, WI 54703	Precast Concrete Slabs and Beams	960038-P (Replaces 900059-P)
Hemstock Concrete Products P.O. Box 578 La Crosse, WI 54603	Spiroll Corefloor Precast Concrete Plank	930017-P

PRECAST CONCRETE

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Mid-States Conc. Products P.O. Box 58 Beloit, WI 53512	Flexicore Prestressed Concrete Plank	970038-P
Molin Concrete Products Co. 415 Lilac Street Lino Lakes, MN 55014	Prestressed Concrete Planks Hi-Stress Flexicore	930059-P (Replaces 910102-P)
Spancrete Industries, Inc. N16 W23415 Stoneridge Dr. Waukesha, WI 53188	Prestressed Wall Panels	970015-P (Replaces 910095-P)
Wisconsin Concrete Masonry Association 9501 South Shore Drive Valders, WI 54245	Pre-engineered Concrete Masonry Buildings	970070-P (Replaces 910038-P (Revised)

SPECIALTY INSULATION CONCRETE PRODUCTS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
American Polysteel Forms: See Berrenberg Enterprises		
Antigo Block Company P.O. Box 34 Antigo, WI 54409	8" and 12" Special Insulation Block	980049-R (Replaces 920069-R)
Berrenberg Enterprises, Inc. 5150 F Edith Boulevard, NE Albuquerque, NM 87107	Polysteel Form Concrete Wall System	960023-R (Replaces 900044-R)
Best Block Company W140 N5998 Lilly Road Butler, WI 53007	Thermogard II Insulation Block	960053-R (Replaces 900019-R)
County Concrete Corporation P.O. Box 278 Marathon, WI 54448	8", 10" and 12" Thermal Block	930043-R
Elastizell Corp. of America P.O. Box 1462 Ann Arbor, MI 48106	Elastizell Cellular Concrete & Ability Form Assembly Construction System	950001-R (Replaces 880011-R)
Quality Concrete Product W249 N6916 Highway J Sussex, WI 53089	Special Insulated Concrete Block	930087-R

SPECIALTY INSULATION CONCRETE PRODUCTS

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Schulz Concrete Products, Inc. 3019 West Prospect Avenue Appleton, WI 54915	8", 10" and 12" Thermal Block	930041-R
Superior Walls of America P.O. Box 427 Ephrata, PA 17522-0427	Precast Concrete Insulated Foundation Wall Sys.	970062-R
ThermaLock Products, Inc. 162 Sweeney Street North Tonawanda, NY 14120-5908	ThermaLock 8",10" & 12" Insulated Concrete Block	940044-R
West Materials, Inc. 1103 West Burnsville Parkway Burnsville, MN 55337	EnerBlock Insulated Concrete Masonry Systems	940024-R (Replaces 880047-R)
Winger Concrete Products, Inc. 6857 Highway 51, South Hazelhurst, WI 54531	8", 10", and 12" Insulated Block	930090-R
Wisconsin Brick & Block 6399 Nesbitt Road P.O. Box 44952 Madison, WI 53774	8", 10" and 12" Thermal Block	930042-R

THERMAL BARRIERS FOR FOAM PLASTIC INSULATION

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Georgia-Pacific Corp. 2861 Miller Road Decatur, GA 30035	Dens-Glass Gold Fiber Glass/Gypsum Sheathing	960015-S (Replaces 900065-S)
Georgia-Pacific Corp. Loop 285, P.O. Drawer 330 Quanah, Texas 79252	Dens-Shield Gypsum Core Tile Backer Board	970019-S (Replaces 910014-S)
W. R. Grace & Co.- Conn. 62 Whittemore Avenue Cambridge, MA 02140	Monokote Type Z-3306 Spray Cementitious Thermal Barrier	970027-S (Replaces 910047-S)

TOILET ROOM FINISHES

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Armstrong World Industries, Inc. P.O. Box 3001 Lancaster, PA 17604	Resilient Floor Covering	970026-T (Replaces 910020-T)
Freudenberg Building Systems 94 Glenn Street Lawrence, MA 01843	Norament 825, 925, & 992S Resilient Rubber Flooring	980037-T (Replaces 920082-T)
Oscoda Plastics, Inc. P.O. Box 189 Oscoda, MI 48750	Protect-All Vinyl Flooring	950018-T
Vinyl Plastics, Inc 3123 South Ninth Street Box 451 Sheboygan, WI 53082	VPI vinyl tile , VPI vinyl and rubber base	980005-T (Replaces 920116-T)

NOTE: Flooring material used in taverns and restaurants is subject to approval by the Department of Health and Social Services under section HSS 196.15 (2).

WOOD CONSTRUCTION

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Alpine Engineered Products 1950 Marley Drive Haines City, FL 33844	FR-Quik & FR-Systems Fire-Rated Assemblies	970033-W
APA-The Engineered Wood Association P.O. Box 11700 Tacoma, WA 98411-0700	PRI Series-Residential Wood I-Joists	980092-W
Best Built Garage Builders 405 Best-Built Parkway P.O. Box 317 Marshall, WI 53559	Garage Component Designs	930022-W (Revised)
Boise-Cascade P.O. Box 2400 White City, OR 97503	(LVL) & (LVRJ) Versa-Lam, Versa-Lam Plus and Versa-Rim 98	960013-W (Replaces 900067-W)
	Wood I-Joist BCI/45, BCI/60	960014-W (Replaces 900068-W)
Fiber-Lam, Inc. P.O.Box 2002 Doswell, VA 23047	Sheathing "Fire-Resistant"	980045-W

WOOD CONSTRUCTION

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Georgia-Pacific Corporation 310 Cypress Road Ocala, FL 34472	Prefabricated Wood I-Beams WI Series Joist	960024-W (Replaces 890019-W)
Georgia-Pacific Corporation 1000 North Park Drive Roxboro, NC 27573	Prefabricated Wood I-Beams G-P Lam(LVL)	950048-W (Revised) (Replaces 890019-W)
	GPI Wood I-Beam Joist	950055-W (Revised)
Hickson Corporation 3941 Bonsal Road Conley, GA 30027	Dricon Fire-Retardant Treated Wood	960073-W (Replaces 900023-W)
Jack Walters & Sons Corp. Junction Hwy. 41 & D, Rt. 1 Allenton, WI 53002	Steel Transfer Plated Columns	940062-W (Replaces 880019-W)
Louisiana-Pacific Corp. 2706 Highway 421 North Wilmington, NC 28401	Wood I-Joists LPI(GNI),TLI & CTR	980082-W (Replaces 950002-W)
	Gang-Lam & TecLam LVL	970095-W (Replaces 970043-W & 940001-W)
Louisiana-Pacific Corp. P.O. Box 629 Red Bluff, CA 96080	LPI-20 and 32 & TLI I-Joists	970096-W (Replaces 960005-W)
Lumbermate see Alpine Engineered Systems		
MiTek Industries, Inc. P.O. Box 7359 St. Louis, MO 63177	Metal Web Parallel Chord Trusses	960022-W (Replaces 900003-N)
Nascor Incorporated 1212-34th Ave. S.E. Calgary, Alberta T2G 1V7 Canada	Wood I-Joists	960046-W

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Standard Structures, Inc. 340 Standard Ave. Windsor, CA 95492	SSI-Wood I-Joists	970077-W
Superior Wood Systems, Inc. 1301 Barfield P. O. Box 1208 Superior, WI 54880	Prefabricated Wood Headers	950013-W (Replaces 890021-W)
	SWI-T Wood I-Joists	970037-W (Replaces 950014-W)
Tecton Laminates, Inc. P.O. Box 587 Hines, OR 97738	TecLam Laminated Veneer Lumber	940001-W see 970095-W (Louisiana-Pacific)
	TLI Wood I-Joists	940034-W see 970096-W (Louisiana-Pacific)
Tembec Forest Products, Temlam Division 48 Boivin St., P.O. Box 1178 Ville-Marie, Quebec JOZ-3W0 Canada	LVL Lumber	970051-W
Trus Joist MacMillan County Road 102 P.O. Box 460 Deerwood, MN 65444	Timberstrand Laminated Strand Lumber (LSL) (Structural Framing Lumber)	940028-W (Replaces 920117-W)
Trus Joist MacMillan 1101 Wood Ridge Center Dr. Suite 116 Charlotte, NC 28217	MICRO-LAM (LVL) Laminated Veneer Lumber	980053-W (Replaces 920016-W)
	Parallam Parallel Strand Lumber	980054-W (Replaces 920028 W)
	TJI Joists	980052-W (Replaces 930004-W)
	TJL,TJH,TJM,TJW & TJS Open Web Truss Series	930007-W
Truswal Systems Corp. 1101 North Great Southwest Parkway Arlington, TX 76011	SpaceJoist	940076-W
	SpaceJoist(Parallel Cord)	950011-W
Universal Forest Products 2801 E. Beltline Rd. Grand Rapids, MI 49525	UFPI Wood I-Joist	970090-W

(Wood Construction)

MANUFACTURER	MATERIAL DESCRIPTION	APPROVAL NUMBER
Willamette Industries, Inc. 375 Dillard Garden Road Winston, OR 97496	StrucLam/G-P Lam Laminated Veneer Lumber	980066-W (Replaces 930025-W)
Willamette Industries, Inc. 2550 Progress Way Woodburn, OR 97071	Residential Wood I-Joist	980072-W (Replaces 920111-W)
	WSI® and StrucJoist® Wood I - Joist	980035-W(Revised) (Replaces 920042-W)

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DIRECT VENT SEALED COMBUSTION CHAMBER APPLIANCES

December 1998

Department of Commerce
Safety and Buildings Division
Material Approval Program
P.O. Box 2689
Madison, Wisconsin 53701-2689
Phone (608) 261-6546

(r.12/98)

DIRECT VENT SEALED COMBUSTION CHAMBER APPLIANCES

Attached is an updated list of manufacturers who have applied for and received approval for use of certain appliance models as direct vent sealed combustion chamber appliances. The models specified in this list meet the definition given in section COMM 51.01 (29a) and may be installed as allowed under section COMM 64.21.

In order to be recognized as an approved unit, the model number specified on plans submitted for review must match exactly the model number specified in this list.

All units must be installed with the venting system specified by the manufacturer for direct vent sealed combustion operation. Type B, BW and L vents are not acceptable for direct vent sealed combustion operation.

As of April 1, 1991, all manufacturers of these appliances are required to obtain a Wisconsin Material Approval. When these manufacturers are issued approvals, the approval number will be listed in the *Wisconsin Building Codes Report*.

BOILERS AND WATER HEATERS

Manufacturer	Trade Names	Model Numbers	Material Approval Number
1.American Water Heater Company MOR-FLO Div./Eastern Region Oakland & Fairview Avenues Johnson City, TN 37605-1378 [Formerly SABH (US) Water Heater Group, Inc.] [Formerly American Water Heater Group 2-28-97]	MOR-FLO, U.S., Craftmaster, American, Champion, Bradford-White	T(R,W)(D,SD)(K,P,V,X,Z) (40S, 40SLP) T(R,W)(D,SD)(K,P,V,X,Z) (50T, 50TLP) (model numbers may have suffix letter V) DVG(1,5,8,10)(1,2) 40S38-(N,P) DVG(1,2)(A,E,H,J) 4038S-(N,P) DVG(1,5,8,10)(1,2) 50T42-(N,P) DVG(1,2)(A,E,H,J) 5042T-(N,P)	970016-H (Rev.#2) [Replaces 910117-H (Rev. 4)]
	Polaris, Bradford-White	DVPB-(35,50) PR-(34,50)(NATV,LPGV) PC100-(34,50)(NATV,LPGV) PVCG52-(34,50)S100-2N PBG2E341002N PBG2(H,J)34100S2N PBG2(E,H,J)50100S2N	
	Polaris	PBG102-(34S100,50T100)-2(N,P) PBCG(3,5)2-(34S100,50T100)-2(N,P) PBG52-34S100-2(N,P) PVG52-34S100-2(N,P)	
	Integra	PV(V,X,Z)N463S-V, PM PV(V,X,Z)N463S-V40 PV(V,X,Z)N463S-V, PMLP PV(V,X,Z)N463S-VL40	

Manufacturer	Trade Names	Model Numbers	Material Approval Number
2.A.O. Smith Water Products U.S. Hwy 1 N, P.O. Box 187 McBee, SC 29101	A.O. Smith or Sealed Shot	FPD-40 FPD-50	950042-H(Rev.) (Replaces 930070-H)
	Legend 2000	L(B,W)-500 L(B,W)-750 L(B,W)-1000	
	A.O. Smith, Abco, Burkay, Cal's, Collins, Colonial, Columbia, Commercial, Conservationist, Continental, Economy, Energy Saver 5, Energy Saver 10, Fuel Saver I, Gas I, Gas II, Gas III, Gladiator, Glascote, Glasteel, Hotspot, Lectro Speed, Liberty 500, Minnegasco, Mustang, National, Paragon, Permaglas, or Sure Shot.	FDV-(40,50)	
	Aos, Commercial, Cyclone, Conservationist and/or Rhino Power	BTH-(120,150,199, 250) BTP-540-A, BTP-700-A	960044-H (Rev.2) (Replaces 940081-H)
A.O.Smith Water Products 401 Frederick Rd. El Paso, TX 79905	Genesis (Dual Use Units)	(GB,GW)(200,300,400, 500,650,750)	970089-H
3.Aerco International 159 Paris Avenue Northvale, NJ 07647	Boilers & Water Heaters	KC-1000 GWB KC-1000 PWB	960025-H (Replaces 900041-H)
	(Water Heaters)	KC-1000 GWW KC-1000 PWW	
	Boiler	BMK-2.0	980079-H
4.Burnham Corporation Hydronics Division P.O. Box 3079 Lancaster, PA 17604	Minuteman & Spirit Boilers	MM(4-,5-,)(70,105,140) SP(3,4,5,6)	960009-H (Replaces 940042-H)
	Evolution	EVH(250,500,750,1000, 1500, & 2000)	980083-H
	Revolution	RV(3,4,5,6,7)	980059-H
5.Fulton Thermatec Corp. P.O.Box 257 Pulaski, NY 13142	(Boilers)	PLP(500,650,750) PHP(500,650,700) PHW(300,500,750,1000)	970001-H(Revised) (Replaces 910097-H)

6.Heat Transfer Products, Inc. Road East Freetown, MA 02717	Voyager Sanitizer Advantage Plus	See pg.21 for model numbers	950063-H(Revision 120 Braley #2)

Manufacturer	Trade Names	Model Numbers	Material Approval Number
7.The Hydrotherm Corp. 260 N. Elm St. Westfield, MA 01085	Multi-Pulse Boilers	AM-100 AM-150 AM-300	940023-H
8.Lennox Industries,Inc. P.O. Box 118077 Carrollton,TX 75011-877	Gas Water Heaters Dual Use	HM30-100/85 HM30-150/130	970082-H (Replaces 950008-H)
9. Lochinvar Corp. 2005 Elm Hill Pike Nashville, TN 37210	Hot Water Boiler Power Fin	P(B,F)N 250B P(B,F)N 500B P(B,F)N 750B P(B,F)N 1000B	980100-H (Replaces 920020-H)
	Copper-Fin II	(CFN,CHN,CPN)-300, -400,-500,-650,-750, -990,-1260,-1440, -1800 & -2070	940035-H (Revised)
	Energy Rite	ERN-150,-200,-250 & -300	
10. Monitor Products, Inc. P.O. Box 3408 Princeton, NJ 08543	Monitor	MZ25S	970056-H(Revised)
11. Patterson-Kelley Div. 100 Burson Street P.O. Box 458 East Stroudsburg, PA 18301	Thermific	(5)(D,N,)-700,-900, -1200,-1500,(-2),-1700(-2), -1900(-2)	960049-H
12. The Peerless Heater Co. 231 N. Walnut St. Boyertown, PA 19512	Series PSC	PSC –03,-04,-05 & -06	970092-H
13. PVI Industries Inc. P.O. Box 7124 Fort Worth, TX 76111	Power VT, Turbopower Maxim Boilers and Water Heaters	Models with suffix "A-TP" (See page 22 for details)	970066-H (Replaces 960006-H)
14. Raypak, Inc. 31111 Aquouva Rd. Westlake Village, CA 93021	Raypak	ADB-500 ADB-750	980073-H
15. RECO Industries, Inc. 1839 Dunbar Road Cavce, South Carolina 29033	Elite	R(14, 18, 25, 32, 40, 50, 60, 70, 80, 90, 100, 120, and 150)	960093-H

16. Rheem Manufacturing Co. Water Heater Division 2600 Gunter Park Drive East Montgomery, AL 36109	Rheemglas Fury DV Ruudglas Master DV Rheemglas Imperial DV Ruudglas Pacemaker DV	21DV50 M50DV 21DX50 P50DV	980064-H (Replaces 920124-H)
Manufacturer	Trade Names	Model Numbers	Material Approval Number
17. Slant/Fin Corp. 100 Forest Drive Greenval, NY 11548	Slant/Fin	KC45 KC90	960008-H
	Concept 21	CB-(45,90,135 & 180)	960086-H
18.State Industries Inc. 500 By-Pass Road Ashland City, TN 37015-1296	Apollo, Censible Reliance, Dixie Super Saver Quick Recovery, and State Super Saver Quick Recovery	See pages 25-26 for Model Numbers	980031-H(Revised) (Replaces 920038-H)
19. Teledyne Laars 20 Industrial Way Rochester, NH 03867	Mighty Max	VW(0320,0400, 0520,0625,0775, and 1000)M	980048-H
20.Trianco-Heatmaker Inc. 111 York Avenue Randolph, MA 02368	Heatmaker Boilers	CB-(M2)-150 CB-(M2)-175 CB-(M2)-200 CB-M2-250 60H(W) 100H(W) 130H(W) H(W)(D)-M2-60 H(W)(D)-M2-100 H(W)(D)-M2-130	970012-H (Replaces 910004-H Revised)
	Heatmaker Water Heaters	HWG-(M2)-150 HWG-(M2)-175 HWG-(M2)-200 HWG-M2-250	
	Advantage 96 Water Heaters	200 NG 200 LP	
21. Utica Boilers, Inc. 2201 Dwyer Ave. Utica, New York 13501	Utica SC Series & Columbia	SC-3,SC-4 & SC-5	970106-H
22. Vaillant Corp. 2607 River Road Cinnaminson, NJ 08077	Vaillant	GA100 SC (-6,-8,-12, & -14)	960074-H
23. Weben-Jarco 4007 Platinum Way	Weben-Jarco Vision 3000	VJHWB-75 VJHWB-100	970054-H

	Dallas, TX 75237			
24.	Weil-McLain A United Dominion Company 500 Blaine Street Michigan City, IN 46360	Weil-McLain Boilers	GV-3 GV-4 GV-5 GV-6	960019-H (Replaces 900042-H)

DUAL USE UNITS

Manufacturer	Trade Names	Model Numbers	Material Approval Number
1. A.O.Smith Water Products 401 Frederick Rd. El Paso, TX 79905	Genesis (Dual Use Units)	(GB,GW)(200,300,400, 500,650,750)	970089-H

FURNACES

Manufacturer	Trade Names	Model Numbers	Material Approval Number
1. Amana Heating & Air Conditioning, Inc 1810 Wilson Parkway Fayetteville, TN 37334	Amana	GUD115(C,X)50(A,B) GUD090(C,X)50(A,B) GUD090(C,X)35(A,B) GUD070(C,X)40(A,B) GUD070(C,X)30(A,B) GUD045(C,X)30(A,B)	970091-H (Replaces 920027-H)
2. Amana Heating & Air Conditioning , Inc. 1810 Wilson Parkway Fayetteville, TN 37334	Amana	GCD070X30B GCD090X40B	960089-H(Revised)
3. American Standard,Inc./ Trane Co. 2231 East State St. Trenton N.J. 08619	Trane XE 90 Furnaces	T(D,U)X040C924 T(D,U)X060C936 T(D,U)X080C942 T(D,U)X100C948 T(D,U)X120C960	940064-H
	American Std. Freedom 90 Furnaces	A(D,U)X040C924 A(D,U)X060C936 A(D,U)X080C942 A(D,U)X100C948 A(D,U)X120C960 The prefix T for the TUX and TDX series may be replaced with the prefix A. The prefix A for the AUX and ADX series may be replaced with the prefix T.	
4. Armstrong Air Conditioning 421 Monroe Street Belleveue, OH 44811	Armstrong, Johnson Air-Ease, American-Air, Concord	See page 11 for Model Numbers	970069-H (Replaces 930083-H (Revised))
5. Bard Manufacturing Co. 1914 Randolph Drive Bryan, OH 43506	Bard	DCH036D30A DCH050D30A DCH065D36A DCH080D48A DCH095D60A DCL065D36X DCH110D60A DCL080D48X DCC050D30A DCL095D60X DCC065D36A DCL110D60X DCC080D48A DCC095D48A Note: Suffix A can be replaced With letters A-Z.	980065-H (Replaces 920093-H)
Carrier: See United Technologies--Carrier			

Manufacturer	Trade Names	Model Numbers	Material Approval Number
6. Consolidated Industries Corp. P.O.Box 7800 Lafayette,IN 47903	Front Runner Quatro Quadpro Quadtech Tech-4	USA(054,072,090)NH3R USA(072,090)NH4R USA(108,126)NH5R	950057-H
	Quatro Quadpro Quadtech Tech-4	UCA(054,072,090)NH3R UCA(072,090)NH4R UCA(108,126)NH5R	
	Clare	CHU(054,072,090)NH3R CHU(072,090)NH4R CHU(108,126)NH5R	
7. Ducane Heating Div. 118 W. Main Street Blackville, SC 29817	Coleman, Ducane, Home-Air,Intertherm, Luxaire,Miller, Moncrief, Pure-Temp, Winchester,York	See pages 15-17 for Model Numbers	980026-H (Replaces 920021-H)
8. Evcon Industries, Inc. P.O. Box 19014 Wichita, KS	Coleman	DGU04512 DGU065(12, 16) DGU08016 DGU09516	930048-H
9. Goodman Mfg. Corp. 1501 Seamist Houston, TX 77008	Janitrol, GMC Kenmore	GSU060-3 GSU080-4 GSU100-4	950058-H (Replaces 920054-H)
10. International Comfort Products(USA) 650 Heil-Quaker Av. P.O. Box 0128 Lewisburg, TN 37091-0128	Arcoaire, Comfortmaker, Heil, Tempstar, Kenmore	See pages 18-20 for Model Numbers See also Ducane Approval	950067-H (Revised) (Replaces 940077-H)
11. Lennox Industries Inc. W229 N1844 Westwood Dr. Waukesha, WI 53186	Lennox	See page 21 for Model Numbers	980033-H(Revised) (Replaces 920043-H (Rev.3))

Manufacturer	Trade Names	Model Numbers	Material Approval Number
12. Modine Manufacturing Co. 1500 DeKoven Avenue Racine, WI 53403	Modine	(PSH,BSH) (130,150, 170, 225, 280, 340) AF All models may have suffix M. Suffix S may replace suffix A. Models may use LP or Natural Gas.	970018-H (Replaces 910060-H)
13. Nordyne, Inc. 1801 Park 270 Drive St. Louis, 63146-4020	Nordyne, Miller Intertherm	G3RCO(40C-12, 60C-12, 80C-16, 100C-20, 120C-20)	970031-H (Replaces 930078-H and 950031-H)
	Nordyne, Miller Intertherm	G5RC0(40C-12, 60C-12,80C-16, 100C-16,120C-16 and 120C-20)	
	Intertherm & Miller	G5RD(-040C-10, -060C-10, -080C-14, -100C-14, -120C-14, -120C-19)	
14. Reznor A Unit of Thomas & Betts McKinley Avenue Mercer, PA 16137	Reznor Duct Furnaces	(H)SC-100-6 (H)SC-125-6 (H)SC-150-6 (H)SC-175-6 (H)SC-200-6 (H)SC-225-6 (H)SC-250-6 (H)SC-300-6 (H)SC-350-6 (H)SC-400-6	940013-H
	Reznor Unit Heaters	SCA-100-6 SC(A,B,E)-125-6 SC(A,B,E)-150-6 SC(A,B,E)-175-6 SC(A,B,E)-200-6 SC(A,B,E)-225-6 SC(A,B,E)-250-6 SC(A,B,E)-300-6 SC(A,B,E)-350-6 SC(A,B,E)-400-6 All models may have prefix H or suffix S.	
15. Rheem Manufacturing Co. P.O. Box 17010 Fort Smith,AK 72917-17010	Century, Comfort-Aire, Intertherm, Miller, Rheem, Ruud, WeatherKing	See pages 22-24 for Model Numbers	980036-H (Replaces 940053-H (Rev. 3))
16. Skymark Inc. P.O. Box 536	Skymark.	GAC40(18,24)12 GAC60(18,24,28)12	950073-H

Cobourg, Ontario, Canada K9A 4L3		GAC80(24,28,32)12	
Manufacturer	Trade Names	Model Numbers	Material Approval Number
17. Sterling Radiator Div. South Fields Street P.O. Box 809 Farmville, NC 27828	Low/High Static Unit Heaters & Duct Furnaces	See page 27-28 for Model Numbers	960002-H (Replaces 920105-H)
18. Suburban Manufacturing Co. P.O. Box 399 Dayton, TN 37321	Dynaline, ,	DL-1220 DL-0912	970049-H (Replaces 910105-H)
19. Thermo Products, Inc. 5235 W. State Rd. 10 North Judson, IN 46366	Thermo-Pride	GLC-(50N,75N,100N,125N) CCA-,CCB-,CHA-, CHB-) (50,75,100,125) (N,P)	970104-H (Replaces 960011-H)
20. Trane Co./American Standard,Inc. 2231 E. State St. Trenton, NJ 08619	Trane and American STD Freedom 90	See page 30 for Model Numbers	980029-H (Replaces 920072-H)
See also, American Std.Inc./ The Trane Co.			
21. United Technologies– Carrier 7310 W. Morris Street Indianapolis, IN 46231	Carrier, Bryant, Day & Night, Payne Payne National	See pages 12-14 for Model Numbers See Also Ducane Approval	970010-H (Replaces 910115-H Rev.)
22. York International Corp. P.O. Box 1592-232F York, PA 17405	Fraser-Johnston, Luxaire, Moncrief, York	See page 31-32 for Model Numbers See also Ducane Approval See also Evcon Approval	960062-H (Rev.) (Replaces 940043-H)

ARMSTRONG AIR CONDITIONING, INC.

The following models are covered by this approval:
970069-H (Replaces 930083-H (Revised))

Trade Name: Armstrong*, Model Numbers:

EDG6F60DC (08, 12)
EDG6F40DC08
EDG6F80DC12
EDG6F100DC (16, 20)
EDG6H40DC8
EDG6H60DC (8, 14)
EDG6H80DC14
EDG6H100DC20

These models ** are direct vent forced air furnaces with cooling units mechanical:

**26HWC122
**38HWC (122, 182, 242)
**51HWC (182, 142)
**64HWC (182, 242)
**51HWC302
**64HWC302
**38HWC302

GUK050D10
GUK050D12
GUK075D14
GUK075D20
GUK100D14
GUK100D20
GUK125D20

* NOTES:

1. Models listed are for use with natural gas and liquefied petroleum gases.
2. All models may have suffix -1 through -999; also may be followed by up to three letters A through Z (except the EDG6F series).
3. All models may have the trade names: American Aire, Johnson Air-Ease or Concord.
4. All Models may have a 1 or 2 letter prefix A through Z.

Trade Name: Armstrong, American Aire, Johnson Air-Ease

Horizontal Forced Air Furnace

GH90A050D12
GH90A075D14
GH90A100D14
GH90A100D20
GH90A125D20

ARMSTRONG AIR CONDITIONING, INC.,cont'd.

Upflow Forced Air Furnace

GU93A045D (10, 12)
GU93A070D (10, 14)
GU93A090D (14, 20)
GU93A115D20

Upflow Forced Air Furnace

GU95A045V12
GU95A067V14
GU95A090V16
GU95A090V20
GU95A112V20
GU95A125V20

Notes: 1. The above models are certified for use with Natural Gas are also for use with Propane Gas with the same input and trade names.

2. All models may have one or two optional prefix letters A through Z (except letters, I , O and Q are not used). For internal manufacturing use, models may have optional suffix -1 through -999
in combination with up to three letters A through Z (letters I, O and Q are not used).

3. All models in the GU93A and GU95A series may have the tenth character L indicating equipped
low No_X inserts.

UNITED TECHNOLOGIES--CARRIER CORPORATION

Trade Names and Models covered under this approval: 970010-H (Replaces 910115-H Rev.)

Trade Name: Carrier Model Number	Trade Name: Bryant, Day & Night, Payne Model Number
58DX040-(CC, GG)	398AAV030040
58DX080-(CC, JG)	398AAV036040
58DX100-(DC, LG)	398AAV036060
	398AAV036080
* 58DXA040-GG	398AAV048080
* 58DXA060-GG	398AAV048100
* 58DXA080-(G, J) G	398AAV060100
* 58DXA100-LG	398AAV060120
	398AAW030040
58DXC040-GG	398AAW036040
58DXC060-GG	398AAW036060
58DXC080-JG	398AAW (036, 048) 080
58DXC100-LG	398AAW (048, 060) 100
	398AAW060120
58SX040-(BC, FG)	398BAW036060
58SX040-(CC, GG)-1	398BAW036080
58SX060-(CC, GG)-1	398BAW060100
58SX080-(BC, CC, GG, JG)-1 0	
58SX100-(CC, DC, JG, LG)-1	398AAZ036040
58SX120-(CC, LG)-1	398AAZ036060
	398AAZ (036, 048) 080
58SXA040-(F, G) G	398AAZ (048, 060) 100
58SXA060-GG	398AAZ060120
58SXA080-(G, J) G	* 399AAZ036040
58SXA100-(J, L) G	* 399AAZ036060
58SXA120-LG	* 399AAZ048080
	* 399AAZ060100
58SXB060-(GG, BC, CG)	
58SXB080-(GG, BC, BG)	398BAZ036060
58SXB100-(H, L, B, D) G	398BAZ036080
58SXB100-DC	398BAZ (042, 060) 100
58SXB060-GG-L	
58SXB080-GG-L	* 399AAV036040
58SXB100-(H, L) G-L	* 399AAV036060
	* 399AAV048080
58SXC040-(F, G) G	* 399AAV060100
58SXC060-GG	
58SXC080-(G, J) G	
58SXC100-(J, L) G	399AAW036040
	399AAW036060
58SXC120-LG	399AAW048080
	399AAW060100

* Model number in these families are Direct Vent Forced Air Furnaces and also have been approved for Manufactured Homes (Mobile Homes).

(Continued on Next Page)

UNITED TECHNOLOGIES--CARRIER (continued)

Trade Name: Carrier Model Number	Trade Name: Bryant, Day & Night, Payne Model Number
58MCA040-(08, 12)	340MAV (024, 036) 040
58MCA060-(12, 16)	340MAV (024, 036, 048) 060
58MCA080-(12, 16, 20)	340MAV (036, 048, 060) 080
58MCA100-(16, 20)	340MAV (048, 060) 100
58MCA120-20	340MAV060120
58MCA140-20	340MAV060140
58MXA040-(08, 12)	350MAV (024, 036) 040
58MXA060-(12, 16)	350MAV (024, 036, 048) 060
58MXA080-(12, 16, 20)	350MAV (036, 048, 060) 080
58MXA100-(16, 20)	350MAV (048, 060) 100
58MXA120-20	350MAV060120
58MXA140-20	350MAV060140
58MVP040-14 (L)	355MAV042040-(L)
58MVP060-14 (L)	355MAV042060-(L)
58MVP080-14 (L)	355MAV042080-(L)
58MVP100-20 (L)	355MAV060100-(L)
58MVP080-20(L)	355MAV060080-(L)
58VUA060-GG-(L)	320AAZ036060-(L)
58VUA080-HG-(L)	320AAZ042080-(L)
58VUA100-LG-(L)	320AAZ060100-(L)
58MVP120-20(L)	355MAV060120-(L)
* 58VCA060-GG	* 321AAZ036060
* 58VCA080-HG	* 321AAZ042080
* 58VCA100-LG	* 321AAZ060100
490AAV-(024, 036) 040	
490AAV-(036, 048) 060	
490AAV-(036, 048, 060) 080	
490AAV-(048, 060) 100	
490AAV-060-120	
490AAV-060-140	

* Model number in these families are Direct Vent Forced Air Furnaces and also have been approved for Manufactured Homes (Mobile Homes).

UNITED TECHNOLOGIES--CARRIER

Notes:

1. The 340MAV, 398AAV, 398AAZ, and 399AAV Series may also have the trade name: Bryant.

2. The 58MVP and 58MXA Series may also have the trade names: Weathermaker, Infinity and Weathermaker 9200, respectively.

3. The 350MAV, 355MAV and 398BAZ Series may also have the trade names: Plus 90 and Plus 90I, respectively.

4. The 58VCA and 58VUA series may also have the trade names: Weathermaker, Infinity or Weathermaker SXI.

5. The 320AAZ and 321AAZ series may also have the trade name: Plus 90i.

6. The 58DXC and 399AAV series may be installed on combustible flooring when equipped with a special base.

7. 58MCA, 58MXA, 58MVP & 340MAV, 350MAV, 355MAV, & 490AAV, Series furnaces may be installed on combustible flooring when equipped with a special base.

DUCANE HEATING DIVISION

This approval: 980026-H(Replaces 920021-H (Revised)) covers the following Trade Names and Models

Company: **Ducane Heating Division**
Trade Names: **Ducane**
Models: FPAA050D13CN(E,H)
FPAA075D13CN(E,H)
FPAA100D34CN(E,H)
FPAA125D34CN(E,H)

All models may have suffix R following the last numerical character.

All models may be used with LP gas with suffix N replaced with suffix P.

Company: **BDP Corp. Div. of Carrier Corp.**
Trade Names: **Bryant, Day & Night, Payne**
Models: 349MAV036050
349MAV036075
349MAV048400
349MAV060125

Company: **Carrier Corp.**
Trade Names: **Carrier**
Models: 58EJA050-GC
58EJA075-GC
58EJA100-JC
58EJA125-LC

Company: **International Comfort Products**
Trade Names: **Heil, Tempstar**
Models: NHGK050AF
NHGK075AF
NHGK100AH
NHGK125AK

Trade Names: **Arcoaire, Comfortmaker**
Models: DGHH050A012IN
DGHH075A012IN
DGHH100A016IN
DGHH125A020IN

Company: **Nordyne**
Trade Names: **Intertherm, Miller**
Models: G1RS050A12
G1RS075A13
G1RS100A16
G1RS125A20

(continued on next page)

DUCANE HEATING DIVISION
(continued)

Continued Approval: 980026-H(Replaces 920021-H (Revised))

Company:	**York International**
Trade Name:	**York**
Models:	P1HDD12N04701A
	P1HDD12N06901A
	P1HDD16N09201A
	P1HDD20N11501A

Company:	**Central Environmental Systems**
Trade Names:	**Luxaire**
Models:	PAHDD12N04701A
	PAHDD12N06901A
	PAHDD16N09201A
	PAHDD20N11501A

Company:	**Rheem Manufacturing Company**
Trade Names:	**Rheem, Ruud, Weatherking**
Models:	RGJA-05EVAES
	RGJA-07EVAES
	RGJA-10ETAGS
	RGJA-12EWAJS

All models may have the trade names: Ruud or Weatherking.

Company:	**Amana Refrigeration, Inc.**
Trade Name:	**Amana**
Models:	GSCO50A3OA
	GSCO75A30A
	GSC100A40A
	GSC125A50A

Company:	**Evcon Industries, Inc.**
Trade Name:	**Coleman**
Models:	CGH05012D
	CGH07512D
	CGH10016D
	CGH12520D

Company:	**Unitary Products**
Trade Names:	**Home-Air, Moncrief, Pure-Temp, Winchester**
Models:	XNH0112G050A
	XNH0112G075A
	XNHO116G100A
	XNH0120G125A

All models may have the trade names: Moncrief, Pure-Temp or Winschester.

DUCANE HEATING DIVISION
(continued)

Continued Approval: 980026-H(Replaces 920021-H (Revised))

Company:	**International Comfort Products Corporation (USA)**
Trade Name:	**Airquest**
Models:	NNCH050AF01
	NNCH075AF01
	NNCH100AH01
	NNCH125AK01

HEAT TRANSFER PRODUCTS, INC.

This approval: 950063-H(Revision #2) covers the following Trade Names and Models

Company: Heat Transfer Products
Trade Name: Voyager
Model Numbers:

SSV76-45SA, SSV76-45SB, SA-76-45, and CSSV76S

SSV90-45SA, SSV90-45SB, SSVH90-45SA, CSSV90-45S, and CSSVH90-45S
SSV100-45RA, SSV100-45RB, and CSSV100-45R

SSV130-30D, SSV130-45SA, SSV130-45RA, SSV130-RB, SSVH130-45SA, CSSV130-45S, CSSV130-45R, and CSSVH130-45S

SSV160-45SA, SA-160-45, and CSSV160-45S

SSV199-45SA, SA-199-45, CSSV199-45S, SSV199-80RA, SSV199-80RB, SA-199-80, CSSV199-80R, CSSVH199-80R, SSVH199-80RA, SSVH199-80RB, SSV199-11RA, SSV199-119RB, SA-199-119, and CSSV199-119R

Trade Name: Sanitizer

Model Numbers: SA130-45, SA160-45, SA199-45

Trade Name: AdvantagePlus

Model Numbers: HE80-130, HE80-160, HE80-199, HE119-130, HE119-160, HE119-199

Notes:

Tank capacity = 30, 45, 80, or 119 gallons.
Btu firing rates = 76,000 / 90,000 / 100,000 / 130,00 / 160,000 / 199,000

'SA' = Sani-Sav model
'C' = Canadian model
'D' = dishwasher booster
'H' = additional coil/heat exchanger (ex: SSVH90-45SA)
'R' or 'S' = maximum temperature setpoint in degrees farenheight; 'R' = 160, and 'S' = 180
'A' or 'B' = warranty code
'HA' followed by 1 or 2 = high altitude (ex: SSV199-45SAHA1)
'LP' = liquid propane fuel.

INTERNATIONAL COMFORT PRODUCTS

The following Trade Names and Models are covered by this approval:
970075-H (Revised) (Replaces 950067 -H)
Trade Names: Arcoaire/Comfortmaker

Models		
GUH(060, 075)A012-I (N, L) ***	Vent Kit No. 8G03022	
GUH100A016-I (N, L) ***	Vent Kit No. 8G03022	
GUH125A016, 020-I (N, L) ***	Vent Kit No. 8G03022	
GUA040A010AI (L, M, N) *+#	Vent Kit No. 8G03004,	8G03024 **
GUA060A012AI (L, M, N) *+#	Vent Kit No. 8G03004,	8G03024 **
GUA080A (012, 016*)AI (L, M, N,)+#	Vent Kit No. 8G03004,	8G03024 **
GUA100A (016, 020*)AI (L, M, N)+#	Vent Kit No. 8G03005,	8G03025 **
GUA120A (016, 020)AI (L, M, N)*+#	Vent Kit No. 8G03005,	8G03025 **
GDA060A012AI (L, M, N)+#	Vent Kit No. 8G03004,	8G03024 **
GDA080A (012, 016)AI (L, M, N)+#	Vent Kit No. 8G03004,	8G03024 **
GDA100A (016, 020)AI (L, M, N)+#	Vent Kit No. 8G03005,	8G03025 **
GDA120A (016, 020)AI (L, M, N)+#	Vent Kit No. 8G03005,	8G03025 **
GDH075A012I (L, M, N)* ***	Vent Kit No. 8G03022	
GDH100A016I (L, M, N)* ***	Vent Kit No. 8G03022	
GDH125A020I (L, M, N)* ***	Vent Kit No. 8G03022	
DGHH050A012I (N, L)		
DGHH075A012I (N, L)		
DGHH100A016I (N, L)		
DGHH125A020I (N, L)		
(A, C)GUA040A010BI (M, N, L)*		
(A, C)GUA060A012BI (M, N, L)*		
(A, C)GUA080A012BI (M, N, L)		
(A, C)GUA080A016BI (M, N, L)*		
(A, C)GUA100A016BI (M, N, L)		
(A, C)GUA100A020BI (M, N, L)*		
(A, C)GUA120A016BI (M, N, L)		
(A, C)GUA120A020BI (M, N, L)*		
GUK050A012-IN		
GUK075A012-IN		
GUK100A016-IN		

GDL050N12A	GNL050N12A
GDL075N12A	GNL075N12A
GDL100N16A	GNL100N16A
GDL125N20A	GNL125N20A
GUK125A020-IN	GCK050N12A1
GDK050A012IN***	GCK075N12A1
GDK075A012IN***	GCK100N16A1
GDK100A016IN***	GCK125N20A1
GDK125A020IN***	

INTERNATIONAL COMFORT PRODUCTS
was: INTER-CITY PRODUCTS

Trade Names: Heil and Tempstar

Models:			
NUG9050FFA1	NUGM050EFA	NDGM050EFA	NCGM050EFA1
NUG9075FGA1	NUGM075EGA	NDGM075EGA	NCGM075EGA1
NUG9100FHA1	NUGM100EHA	NDGM100EHA	NCGM100EHA1
NUG9125FKA1	NUGM125EKA	NDGM125EKA	NCGM125EKA1

Trade Names: Heil, Tempstar, Airquest and Kenmore

Models:	
Downflow	Upflow/Horizontal
NDC7050BFA	NTC7050BFA
NDC7075BFA	NTC7075BFA
NDC7100BHA	NTC7100BHA
NDC7125BKA	NTC7125BKA

Trade Names: Heil, Temp star, Airquest and Kenmore

Models:			
NT (C,N) 5050	GNJ050	NUG3050	GUJ050
NT (C,N) 5075	GNJ075	NUG3070	GUJ075
NT (C,N) 5100	GNJ100	NUG3100	GUJ100
NT (C,N) 5125	GNJ125	NUG3125	GUJ125
NT (C,N) 5150	GNJ150		

Trade Names: Arcoaire/Comfortmaker

Models:	
GNK050N12A	GNM050N12A
GNK075N14A	GNM075N14A
GNK100N16A	GNM100N16A
GNK125N20A	GNM125N20A

Trade Names: Heil and Tempstar

Models:	
NTGM050EFA	NTG9050FFA
NTGM075EGA	NTG9075FGA
NTGM100EHA	NTG9100FHA
NTGM125EKA	NTG9125FKA

Notes:

1) The GUH and GDH Series may have the eleventh character replaced by A, B, C, or D, etc., indicating the manufacturer internal code.

2)** These units are approved for venting with high temperature plastic pipe. The manufacturer makes a vent termination kit which is certified by AGA for use with these furnaces.

3) Models with suffix M are equipped with main burner rods for use with natural gas only, (GDAO Series).

4) The GDA, GDK and NDGM Series are downflow furnaces.

5) The GUH and GUA Series are upflow furnaces.

6) The CGUA Series are upflow gas furnaces with cooling.

7) The CGDA Series are counterflow gas furnaces with cooling.

8) The DGH Series are horizontal gas furnaces with cooling.

9) The NUG Series listed for use with natural gas also are for use with liquefied petroleum gases with the same ratings, clearances and trade names, but with prefix G replaced by prefix L.

10) The GDA, GDH, GUA, GUH and GUK Series listed for use with natural gas also are for use with liquefied petroleum gases with the same ratings, clearances and trade names, but with suffix N replaced by suffix L.

11) The GUA Series may have prefix A or C.

12) The GUH Series may have prefix A, B, C, or E.

13) The GUK, GDK and NDGM Series may have the eleventh character replaced by A through Z.

14) The GUA Series may have the eleventh character B replaced by subsequent letters.

15) The GUK and NUGM Series may be derated 20% with no model number change.

16) The NUG9 Series may have the fourth character 9 replaced by M and eight character F replaced by E to indicate a 20% derate.

17) The GDA, GDK and GDH Series may be installed on combustible flooring when equipped with a special base.

18) + clearance may be 3 inches when type B-1 vent is used.

19) # clearance may be 1 inch when type B-1 vent is used. When optional vent damper is supplied, a 6-inch clearance to vent damper is required.

20) * unit has been determined to be a Category I type furnace when vented vertically and may be vented horizontally when employing special vent kits.

21) *** unit has been determined to be a Category IV type furnace when vented vertically and may be vented horizontally when employing special vent kits.

22) The GDK and NDGM series listed for use with natural gas also are for use with liquified petroleum gases with the same ratings, clearances and trade names.

23) The eight character E of the NDGM series indicates 90 percent sealed combustion, dual certified (direct vent or central furnace).

24) The NDGM series may have the trade name Airquest.

25) Models series NUG, and GUJ models are for upflow installation only.

26) Models series NT(C,N)5, and GNJ may be installed as upflow or horizontal.

27) See the Material Approval document for instructions for horizontal venting of the NT(C,N)5and GNJ series with thermoplastic vent pipe.

LENNOX INDUSTRIES INC.

The following models are covered by this approval: 980033-H (Revised) (Replaces 920043-H, Rev. 3)

Trade Name: Lennox, Model Numbers:

Model Numbers:

G21V3-60-**
G21V3-80-**
G21V5-80-**
G21V5-100-**
G21Q (2,3)-40-**
G21Q (3,4)-60-**
G21Q (3,4,5)-80-**
G21Q (3,4/5)-100-**

GSR21V3-80-**
GSR21V5-80-**
GSR21V5-100-**
GSR21Q3-50-**
GSR21Q4-50-**
GSR21Q3-80-**
GSR21Q4/5-80-**
GSR21Q4/5-100-**

GSR14Q4/5-100-**
GSR14Q3-80-**
GSR14Q4-80-**
GSR14Q4/5-80-**
GSR14Q3-50-**
GSR14Q4-50-**

G26Q2-50-**
G26Q3-50-**
G26Q3-75-**
G26Q4/5-75-**
G26Q3/4-100-**
G26Q4/5-100-**
G26Q3/4-125-**
G26Q4/5-125-**

GHR26Q2 / 3-50-**
GHR26Q3-75-**
GHR26Q3 / 4-100-**
GHR26Q4 / 5-100-**
GHR26Q4 / 5-120-**
GSR21CV5-80-**
GSR21CV5-100-**

G25MV3-60A**
G25MV3-75A**
G25MV5-100A**
G25MV5-120A**

NOTES:

1) The GSR14Q3-50-**, GSR21Q3-50-**, GSR21Q4-50-**, and GRS14Q4-50-** Series are also for installation in manufactured homes (mobile homes).

2) -** Suffix may be any number 0 through 99 and may or may not be followed by a letter. Suffix indicates minor revisions to all of the above equipment, and does not affect operation, performance, certifications or approval by independant agencies.

The GSR14 and GSR21 Series for installation on noncombustible floors only may be installed on combustible flooring when equipped with a special base.

The following models are covered by this approval: 980033-H (Revised)(Replaces 920043-H, Rev. 3)

Trade Name: Lennox, Model Numbers:

Model Numbers:

G14Q2-40-*
G14Q3-40-*
G14Q3-80-*
G14Q4-80-*
G14Q3-60-*
G14Q4-60-*
G14Q3-40-*
G14Q5-80-*
G14Q3-100-*
G14Q4/5-100-*

G32Q3-75-**
G32Q3/4-100-**
G32Q4/5-100-**
G32Q4/5-125-**
G32V3-75-**
G32V5-100-**
G32V5-125-**

PVI INDUSTRIES

The following model numbers are covered by this approval: 970066-H (Replaces 960006-H)

Note that only the gas-fired appliances with the A-TP suffix may be installed as direct vent sealed combustion chamber appliances.

Trade Name: Maxim

Model Numbers:		
72P 125A-MX	72P 250A-MX	27N 250A-MX
72N 125A-MX	72N 250A-MX	27P 250A-MX
14P 125A-MX	20P 125A-MX	27P 125A-MX
14N 125A-MX	20N 125A-MX	27N 125A-MX
40P 125A-MX	40P 250A-MX	54P 125A-MX
40N 125A-MX	40N 250A-MX	54N 125A-MX
80P 125A-MX	80P 250A-MX	54P 250A-MX
80N 125A-MX	80N 250A-MX	54N 250A-MX
100P 250A-MX	120P 250A-MX	140P 250A-MX
100N 250A-MX	120N 250A-MX	140N 250A-MX

**Trade Name: Power VT

Model Numbers	
560P 125A-PV	560N 125A-PV
800P 125A-PV	800N 125A-PV
560P 250A-PV	560N 250A-PV
800P 250A-PV	800N 250A-PV
1060P 250A-PV	1060N 250A-PV
1400P 250A-PV	1400N 250A-PV

Water heater model number designation.

XXXX(-2) XXX XXXXX X-XXXX
A B C D

A - Indicates the approximate water recovery rate in gallons per hour - 125, 250, 375, 500, 625, 750, 875, 1,000, 1,250, 1,500, 1,750, 2,000, 2,500, or 3,000. When a "2" is included, the heater contains two energy modules of equal size and input. Energy sources may be gas or oil.

B - Indicates the tank lining type - G, N, or P, may be followed by HE, D or T.

C - A two to five digit number indicating the tank capacity in gallons, 50, 125, 150, 175, 190, 220, 225, 230, 250, 270, 300, 400, 500, 600, 750, 900, 1000, 1250, 1500, 1750, 2000, 2500, 3000, 3500, 4000, or 4500.

D. A-TP = gas-fired (single or dual burner)
A-TPO = oil-fired (single or dual burner)
A-TPGO = gas-/oil-fired (dual burner, one oil, one gas)

Boiler model number designation.

XXX	XXXX	XXXXX	X-XXXX
A	B	C	D

A - Indicates the normal boiler output in horsepower.

B - Indicates steam or hot water boiler operation, SBHE or WBHE.

C - A two to five digit number indicating the nominal capacity of the tank in gallons, 50, 100, 125, 150, 175, 200, 225, 250, 300, 350, 400, 600, or 1500.

D. A-TP = gas-fired (single or dual burner)
A-TPO = oil-fired (single or dual burner)
A-TPGO = gas-/oil-fired (dual burner, one oil, one gas)

RHEEM MANUFACTURING CO.
(FURNACES)

The following models and trade names are covered by this approval:
Approval # 940053-H (Rev. 3)(Replaces 910076-H)

	RHEEM* Trade Name: Rheem MODEL NO.	RUUD* Trade Name: RUUD MODEL NO.	WEATHERKING Trade Name: Weatherking MODEL NO.	NORDYNE Trade Name: Intertherm and Miller MODEL NO.	HEAT CONTROLLER Trade Name: Century and Comfort-Air MODEL NO.
UPFLOW	RGEC-04EMAES RGEC-06EMAES RGEC-07EMAGS RGEC-09ERAJS RGEC-10ERAJS RGEC-12ERAJS	UGEC-04EMAES UGEC-06EMAES UGEC-07EMAGS UGEC-09ERAJS UGEC-10ERAJS UGEC-12ERAJS	WGUC045A-D3 WGUC060A-D3 WGUC075A-D4 WGUC090A-D5 WGUC105A-D5 WGUC120A-D5	G1RC-045A12 G1RC-060A15 G1RC-075A15 G1RC-090A20 G1RC-105A19 G1RC-120A20	GZUB45-E3N GZUB60-E3.5N GZUB75-E3.5N GZUB90-E4N GZUB105-E4N GZUB120-E5N
DOWNFLOW	RGKB-04EMAES RGKB-06EMAES RGKB-07EMAGS RGKB-09ERAJS RGKB-10ERAJS RGKB-12ERAJS	UGKB-04EMAES UGKB-06EMAES UGKB-07EMAGS UGKB-09ERAJS UGKB-10ERAJS UGKB-12ERAJS	WGDC045A-D3 WGDC060A-D3 WGDC075A-D4 WGDC090A-D5 WGDC105A-D5 WGDC120A-D5	G1RL-045A12 G1RL-060A113 G1RL-075A14 G1RL-090A18 G1RL-105A18 G1RL-120A18	GZDB45-E3N GZDB60-E3N GZDB75-E3.5N GZDB90-E4N GZDB105-E4N GZDB120-E4N
UPFLOW	RGED-04EMAES RGED-06EMAES RGED-07EMAGS RGED-09ERAJS RGED-10ERAJS RGED-12ERAJS	UGED-04EMAES UGED-06EMAES UGED-07EMAGS UGED-09ERAJS UGED-10ERAJS UGED-12ERAJS	WGUC045B-D3 WGUC060B-D3 WGUC075B-D4 WGUC090B-D5 WGUC105B-D5 WGUC120B-D5	G2RC-045A12 G2RC-060A15 G2RC-075A15 G2RC-090A20 G2RC-105A19 G2RC-120A20	GZUC45-E3N GZUC60-E3.5N GZUC75-E3.5N GZUC90-E4N GZUC105-E4N GZUC120-E5N
DOWNFLOW	RGKC-04EMAES RGKC-06EMAES RGKC-07EMAFS RGKC-09ERAJS RGKC-10ERAJS RGKC-12ERAJS	UGKC-04EMAES UGKC-06EMAES UGKC-07EMAFS UGKC-09ERAJS UGKC-10ERAJS UGKC-12ERAJS	WGDC045B-D3 WGDC060B-D3 WGDC075B-D4 WGDC090B-D5 WGDC105B-D5 WGDC120B-D5	G2RL-045A12 G2RL-060A13 G2RL-075A14 G2RL-090A18 G2RL-105A18 G2RL-120A18	GZDC45-E3N GZDC60-E3N GZDC75-E3.5N GZDC90-E4N GZDC105-E4N GZDC120-E4N

Note: *The final suffix S may be replaced by a suffix V.

RHEEM MANUFACTURING CO.
(Cont'd.)

The following models and trade names are covered by this approval:
Approval # 940053-H (Rev. 3)(Replaces 910076-H)

UPFLOW			
RHEEM	RUUD	WEATHERKING	HEAT CONTROLLER
Trade Name: Rheem Model No.	Trade Name: Ruud Model No.	Trade Name: Weatherking Model No.	Trade Name: Century and Comfort-Aire Model No.
RGR(A,J)-04EMAE	UGR(A,J)-04EMAE	WGR (A,J)-04EMAE	GLDA45-E3N
RGR(A,J)-04NMAE	UGR(A,J)-04NMAE	WGR(A,J)-04NMAE	GLDA45-E3NX
RGR(A,J)-06EMAE	UGR(A,J)-06EMAE	WGR(A,J)-06EMAE	GLDA60-E3N
RGR(A,J)-06NMAE	UGR(A,J)-06NMAE	WGR(A,J)-06NMAE	GLDA60-E3NX
RGR(A,J)-07EMAE	UGR(A,J)-07EMAE	WGR(A,J)-07EMAE	GLDA75-E3N
RGR(A,J)-07NMAE	UGR(A,J)-07NMAE	WGR(A,J)-07NMAE	GLDA75-E3NX
RGR(A,J)-09EZAJ	UGR(A,J)-09EZAJ	WGR(A,J)-09EZAJ	GLDA90-E5N
RGR(A,J)-09NZAJ	UGR(A,J)-09NZAJ	WGR(A,J)-09NZAJ	GLDA90-E5NX
RGR(A,J)-10EZAJ	UGR(A,J)-10EZAJ	WGR(A,J)-10EZAJ	GLDA105-E5N
RGR(A,J)-10NZAJ	UGR(A,J)-10NZAJ	WGR(A,J)-10NZAJ	GLDA105-E5NX
RGR(A,J)-12ERAJ	UGR(A,J)-12ERAJ	WGR(A,J)-12ERAJ	GLDA120E5N
RGR(A,J)-12NRAJ	UGR(A,J)-12NRAJ	WGR(A,J)-12NRAJ	GLDA120-E5NX

DOWNFLOW			
RHEEM	RUDD	WEATHERKING	HEAT CONTROLLER
RGSA-04EMAE	UGSA-04EMAE	WGSA-04EMAE	GLUA45-E3N
RGSA-04NMAE	UGSA-04NMAE	WGSA-04NMAE	GLUA45-E3NX
RGSA-06EMAE	UGSA-06EMAE	WGSA-06EMAE	GLUA60-E3N
RGSA-06NMAE	UGSA-06NMAE	WGSA-06NMAE	GLUA60-E3NX
RGSA-07EMAE	UGSA-07EMAE	WGSA-07EMAE	GLUA75-E3N
RGSA-07NMAE	UGSA-07NMAE	WGSA-07NMAE	GLUA75-E3NX
RGSA-09EZAJ	UGSA-09EZAJ	WGSA-09EZAJ	GLUA90-E5N
RGSA-09NZAJ	UGSA-09NZAJ	WGSA-09NZAJ	GLUA90-E5NX
RGSA-10EZAJ	UGSA-10 EZAJ	WGSA-10EZAJ	GLUA105-E5N
RGSA-10NZAJ	UGSA-10NZAJ	WGSA-10NZAJ	GLUA105-E5NX
RGSA-12ERAJ	UGSA-12ERAJ	WGSA-12ERAJ	GLUA120-E5N
RGSA-12NRAJ	UGSA-12NRAJ	WGSA-12NRAJ	GLD120-E5NX
DOWNFLOW/HORIZONTAL			
RHEEM	RUUD	WEATHERKING	HEAT CONTROLLER
Trade Name: Rheem Model No.	Trade Name: Ruud Model No.	Trade Name: Weatherking Model No.	Trade Name: Century and Comfort-Aire Model No.
RGT(A,J)-04EMAES	UGT(A,J)-04EMAES	WGT(A,J)-04EMAES	GLDH45-E3N
RGT(A,J)-06EMAES	UGT(A,J)-06EMAES	WGT(A,J)-06EMAES	GLDH60-E3N
RGT(A,J)-07EMAES	UGT(A,J)-07EMAES	WGT(A,J)-07EMAES	GLDH75-E3N
RGT(A,J)-07EYBGS	UGT(A,J)-07EYBGS	WGT(A,J)-07EYBGS	GLDH75-E4N
RGT(A,J)-09EZAJS	UGT(A,J)-09EZAJS	WGT(A,J)-09EZAJS	GLDH90-E5N
RGT(A,J)-10EZAJS	UGT(A,J)-10EZAJS	WGT(A,J)-10EZAJS	GLDH105-E5N
RGT(A,J)-12ERAJS	UGT(A,J)-12ERAJS	WGT(A,J)-12ERAJS	GLDH120-E5N

STATE INDUSTRIES INC.

The following models are covered by this approval: 980031-H(Revised) (Replaces 920038-H)

Trade Name:	Model Number
Apollo	A5-40-40.0NADS840
	A5-40-40.0NBDS840
	A5-50-44.0PADS850
	A5-50-44.0PBDS850
	A5-50-48.0NADS850
	A5-50-48.0NBDS850

The prefix digit 5 may be replaced by prefix 1, 3, 6, 7, or 10. The models may have suffix C, D, F, J, L, V, W, or Z.

Trade Name	Model Number
Censible	PRV-30-N0DS630
	PRV-40-N0DS640
	PRV-50-N0DS650

The prefix PRV may be replaced by prefix PRI or PRX. All models may have suffix C, D, F, J, L, NC, V, W, or Z.

Trade Name	Model Number
Dixie	5-30-NODS630
	5-40-NADSL840
	5-40-NODS640
	5-50-NADSL850
	5-50-NODS650
	8-30-NADS630
	8-40-NADS640
	8-50-NADS650

The prefix digit 5 or 8 may be replaced by prefix 1, 3, 6, 7, or 10.

The prefix digit 5 or 8 may be prefixed by one of the following: H, JE, N, SW, or UP.

The models may have suffix C, D, F, J, L, NC, V, W, or Z.

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All models with the trade name Dixie may have the trade names: Ambassador, Capital, Hajoca, Jesco, Mission, Penfield, Penfield/State, President, Satellite, Sentry, Superglass or Top Line.

Trade Name	Model Number
Reliance	8-50-NADS650
	5-30-N0DS630
	8-30-NADS630
	8-40-NADS640
	5-50-NODS650
	5-40-N0DS640

The prefix digit 5 may be replaced by prefix 1, 3, 6, 7, or 10.

The prefix digit 5 may be prefixed by one of the following: MS, RE, or RX.

The models may have suffix A, C, D, F, J, L, NC, V, W, or Z.

The models may have the trade names: Ace, Agway, Cenex, HWI, Hardware House/Superior, Regency, Rexcel, Sentry, or Thermo-King.

Trade Name	Model Number
Super Saver Quick Recovery	SR8-30-NADS630
	SR8-40-NADS640
	SR8-50-PADS650
	SR8-50-NADS650

The prefix SR8 may be replaced by prefix SRX.

The models may have suffix C, D, F, J, L, NC, V, W, or Z.

Trade Name	Model Number
State Super Saver Quick Recovery	SRV-40-NADSL840
	SRV-50-PADSL850
	SRV-50-NADSL850

The prefix SRV may be replaced by prefix SRX.

The models may have suffix C, D, F, J, L, NC, V, W, or Z.

STERLING RADIATOR DIVISION

The following models are covered by this approval: 960002-H (Replaces 920105-H)

Low-Static Pressure

GAND (010, 012, 015, 017, 020, 022, 025, 030, 035, 040)

High-Static Pressure

GKND (010, 012, 015, 017, 020, 022, 025, 030, 035, 040)

Separated Combustion Duct Furnace:

GMND (010, 012, 015, 017, 020, 022, 025, 030, 035, 040) AD

Notes:

1. The above models may have a minimum input rating 50 percent of the maximum input rating.

* 2. A separated combustion system appliance. A system consisting of an appliance and a vent cap(s) specified by the manufacturer and (1) combustion air connections between the appliance and the outside atmosphere, and (2) flue gas connections between the appliance and vent cap, of a type(s) specified by the manufacturer but supplied by the installer, constructed so that, when installed in accordance with the manufacturer's instructions, air for combustion is obtained from the outside atmosphere and flue gases are discharged to the outside atmosphere.

3. The models listed for use with natural gas also are for use with liquefied petroleum gases with the same ratings and trade names, but with the third character N replaced by P.

4. The GMND and GMPD series may have an eight character A replaced by B, C, D, E, or S.

5. The GMND and GMPD series may have a ninth character D replaced by E, H or J.

* Trade Name: **Sterling**, Model Numbers for:

Low/High Static unit Heater **(Separated Combustion):**

QVS (F,B) (100, 125, 150, 175, 200, 225, 250, 300, 350, 400)

Separated Combustion Duct Furnace:

QVSD - (100, 125, 150, 175, 200, 225, 250, 300, 350, 400)

Notes:

1. The models listed for use with natural gas also are for use with liquefied petroleum gases with the same ratings, clearances and trade name.

2. The above models may have a minimum input rating 50 percent of the maximum input rating.

* 3. A separated combustion system appliance. A system consisting of an appliance and a vent cap(s) specified by the manufacturer and (a) combustion air connections between the appliance and the outside atmosphere, and (2) flue gas connections between the appliance and vent cap, of a type(s) specified by the manufacturer but supplied by the installer, constructed so that when installed in accordance with the manufacturer's instructions, air for combustion is obtained from the outside atmosphere and flue gases are discharged to the outside atmosphere.

4. The QVSD series may have suffix M indicating a minimum input rating 50 percent of the maximum input rating.

* Trade Name: **American Standard**, Model Numbers for:

Separated Combustion Duct Furnace:

AMND (010, 012, 015, 017, 020, 022, 025, 030, 035, 040) AD

Notes:

1. The models listed for use with natural gas also are for use with liquefied petroleum gases with the same ratings and trade names, but with the third character N replaced by P.
2. The AMND series may have a minimum input rating 50 percent of the maximum input rating.
3. The AMND and AMPD series may have an eight character A replaced by B, C, D, E or S.
4. The AMND and AMPD series may have a ninth character D replaced by E, H or J.

SUBURBAN MANUFACTURING CO.

The following models are covered by this approval: 970049-H (Replaces 910105-H (Expired))

SUBURBAN MFG. Co					
Trade Name: DYNACEIL Model No.	**Trade Name: DYNAVENT** Model No.	**Trade Name: DYNAWALL** Model No.	**Trade Name: DYNALINE** Model No.	**Trade Name: DYNATWIN** Model No.	**Trade Name: TWINAIRE** Model No.
DCF-24G DCF-24GC DCF-30G DCF-30GC	DNV-25GS DNV-40GS	GSW-20K GSW-30K DWW-14P DWW-14PT DWW-22P DWW-22PT DWW-40P DWW-40E DWW-55P DWW-55E DWW-65P	DL-1220 DL-0912	HF-50	DT-1020 TA-1020 DT-1020C TA-1020C

The models listed use natural or liquefied petroleum gas.

THE TRANE COMPANY

The following model numbers are covered by this approval: 980029-H

TRADE NAME: TRANE				
XE 90	TDX040C924A1 TDX060C936A1 TDX080C942A1 TDX100C948A1 TDX100C960A1	TDX040C924B0 TDX060C936B0 TDX080C942B0 TDX100C948B0 TDX100C960B0	TDX040C924B1 TDX060C936B1 TDX080C942B1 TDX100C948B1 TDX100C960B1	
XE 90	TUX040C924A1 TUX060C936A1 TUX080C942A1 TUX100C948A1 TUX100C960A1 TUX120C960A1	TUX040C924B0 TUX060C936B0 TUX080C942B0 TUX100C948B0 TUX100C960B0 TUX120C960B0	TUX040C924B1 TUX060C936B1 TUX080C942B1 TUX100C948B1 TUX100C960B1 TUX120C960B1	TUX040C924B2 TUX060C936B2 TUX080C942B2
XV 90	TDY080R9V3A0 TDY100R9V4A0 TDY120R9V5A0	TDY080R9V3A1 TDY100R9V4A1 TDY120R9V5A1	TDY080R9V3A2	
XV 90	TUY080R9V3A0 TUY100R9V4A0 TUY120R9V5A0	TUY060 R9V3A1 TUY080 R9V3A1 TUY100 R9V4A1 TUY120 R9V5A1	TUY060R9V3A2 TUY080R9V3A2	
TDX (060, 080, 100, 120) B (930, 942, 948, 960) (A0, A1)				
TUX (040, 060, 080, 100, 120) B (942, 936, 960, 948) (A0, A1)				

TRADE NAME: AMERICAN STANDARD INC.					
Freedom 90	ADX040C924A1 ADX060C936A1 ADX080C942A1 ADX100C948A1 ADX100C960A1	ADX040C924B0 ADX060C936B0 ADX080C942B0 ADX100C948B0 ADX100C960B0	ADX040C924B1 ADX060C936B1 ADX080C942B1 ADX100C948B1 ADX100C960B1		
Freedom 90	AUX040C924 AUX060C936 AUX080C942 AUX100C948 AUX100C960 AUX120C960	AUX040C924A1 AUX060C936A1 AUX080C942A1 AUX100C948A1 AUX100C960A1 AUX120C960A1	AUX040C924B0 AUX060C936B0 AUX080C942B0 AUX100C948B0 AUX100C960B0 AUX100C960B0	AUX040C924B1 AUX060C936B1 AUX080C942B1 AUX100C948B1 AUX100C960B1 AUX100C960B1	AUX040C924B2 AUX060C936B2 AUX080C942B2
Freedom 90	ADY080R9V3A0 ADY100R9V5A0 ADY120R9V5A0	ADY080R9V3A1 ADY100R9V4A1 ADY120R9V5A1	ADY080R9V3A2		
Freedom 90	AUY080R9V3A0 AUY100R9V4A0 AUY120R9V5A0	AUY060R9V3A1 AUY080R9V3A1 AUY100R9V4A1 AUY120R9V5A1	AUY060R9V3A2 AUY080R9V3A2		

Note: 1. These models are also approved for use with LP gas. They will have the eighth character 9 replaced by K.

2. All models may have final suffix 0 through 9.

YORK INTERNATIONAL CORPORATION.

The following models are covered by this approval: 960062-H (Revised)(Replaces 940043-H)

CENTRAL ENVIRONMENTAL SYSTEMS			
Trade Name: Fraser-Johnston Model No.	Trade Name: York Model No.	Trade Name: Luxaire Model No.	Trade Name: Coleman-Evcon Model No.
PBNU-LD06(N,P)040A	P1UDD06N03801A	PANU-LD10N060A	
PBNU-LD16(N,P)120A	P1UDD10N05701A	PANU-LD12N080A	
PBNU-LD10(N,P)060A	P1UDD12N07601A	PANU-LD12N100A	
PBNU-LD10(N,P)060B	P1UDD12N09501A	PANU-LD16N120A	
PBNU-LD12(N,P)080A	P1UDD16N11401A	PANU-LD20N140A	
PBNU-LD12(N,P)100A	P1UDD20N13301A	PANU-LD20N160A	
PBNU-LD20(N,P)140A	P1UDD20N15201A		
		PBNU-LD06(N,P)040A	
PANU-LD06N040A	P2UDD06(N,P)03801A	PBNU-LD10(N,P)060A	
PANU-LD12N100A	P2UDD12(N,P)11401A	PBNU-LD10(N,P)060B	
PANU-LD10N060A	P2UDD10(N,P)05701A	PBNU-LD12(N,P)080A	
PANU-LD12N080A	P2UDD10(N,P)05701B	PBNU-LD12(N,P)100A	
PANU-LD16N120A	P2UDD12(N,P)07601A	*PBNU-LD16(N,P)120A	
PANU-LD20N140A	P2UDD12(N,P)09501A	*PBNU-LD16(N,P)120B	
PANU-LD20N160A	P2UDD16(N,P)11401A	PBNU-LD20(N,P)140A	
	P2UDD16(N,P)11401B	PBNU-LD20(N,P)100C	
PAHDD12N04701	P2UDD20(N,P)13301A	PANU-LD06N040A	
PAHDD12N06901	P1UDD12(N,P)09501A		
PAHDD16N09201	P2UDD20(N,P)09501C	PAND-LD10N060A	
PAHDD20N11501		PAND-LD12N080A	
	P1CDD10N05701A	PAND-LD16N100A	
**PBLU-LD08N040	P1CDD12N07601A	PAND-LD20N120A	
**PBLU-LD10N060	P1CDD16N09501A		
**PBLU-LD12N080	P1CDD20N11401A	PBNU-LD12N080	
**PBLU-LD16N080		PBNU-LD16N080	
**PBLU-LD14N100	P2UDD12N07601	PAHDD12N04701	
**PBLU-LD20N100	P2UDD16N07601	PAHDD12N06901	
**PBLU-LD20N120		PAHDD16N09201	
**PBLU-LD20N140	P1HDD12N04701	PAHDD20N011501	
	P1HDD12N06901		
PCLU-LD08N040	P1HDD16N09201	PCLU-LD08N040	
PCLU-LD10N060	P1HDD20N11501	PCLU-LD10N060	
PCLU-LD12N080		PCLU-LD12N080	
PCLU-LD16N080	P2URD08N03701	PCLU-LD16N080	
PCLU-LD14N100	P2URD10N05501	PCLU-LD14N100	
PCLU-LD20N100	P2URD12N07501	PCLU-LD20N100	
PCLU-LD20N120	P2URD16N07501	PCLU-LD20N120	

YORK INTERNATIONAL CORPORATION.(cont'd.)

The following models are covered by this approval: 960062-H (Revised)(Replaces 940043-H)

CENTRAL ENVIRONMENTAL SYSTEMS			
Trade Name: Fraser-Johnston Model No.	Trade Name: York Model No.	Trade Name: Luxaire Model No.	Trade Name: Coleman-Evcon Model No.
PCLU-LD20N140	P2URD14N09501	PCLU-LD20N140	
	P2URD20N09501		
	P2URD20N11201		
	P2URD20N13001		
	P3URD08N03701		
	P3URD10N05501		
	P3URD12N07501		
	P3URD16N07501		
	P3URD14N09501		
	P3URD20N09501		
	P3URD20N11201		
	P3URD20N13001		

Notes:

* These models with the trade name Luxaire may have the trade names Fraser-Johnston or Moncrief.

All models (except the PAHDD-, PAND-, P1CDD- and P1HDD- series) may have final suffix A through Z.

** These models with trade name Fraser-Johnson may have the trade name Luxaire.

The PBUN- and PAHDD- series may have the trade name Moncrief.

The PAHDD- and P1HDD- series are listed for use with natural gas also for use with liquefied petroleum gases with the same ratings, clearances and trade names.

The other models listed for use with natural gas also are for use with liquefied petroleum gases with the same ratings, clearances and trade names, but with suffix N replaced by suffix P.

The PAND- and P1CDD- series may have final suffix A replaced by suffix B through Z.

The PAND- and P1CDD- series may be installed on combustible flooring when equipped with a special base.

The PAHDD- and P1HDD- series are for line contact installation.

The PAHDD- and P1HDD- series have been determined to be a Category IV type furnace when vented vertically and may be vented horizontally when employing special kits.

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