

## *Printed WBCR* at a minimum this month to conserve resources

### January articles offered here

The printed January 2002 *WBCR* was shortened to four pages. However, a full set of articles is available here on the Safety and Buildings Division WebSite or on paper.

The division is doing this for January in order to save printing and mailing costs. The unsettled economy in Wisconsin has reduced the division's fee income below budget

expectations. This is a time to be take extra, unusual steps to control spending.

Complete articles that would have been in the January *WBCR* are available on the S&B WebSite, <http://www.commerce.state.wi.us/SB/SB-DivPublications.html>. There are two formats of the information on the site.

Paper copies of the articles can be obtained from Todd, Taylor, S&B Publications Editor, 608-267-3606.

**It is now possible for individuals to check on the S&B WebSite the expiration dates and continuing education status of their credentials.** You may also search for groups of credentials holders, up to 500 at a time. About 30 percent of the S&B credential categories have more than 500 card holders. Lists of people in those larger categories soon will be posted on the WebSite. <http://www.commerce.state.wi.us/SB/SB-CredentialStatusCheck.html>.

## Articles listed below and on page 3 are on following pages.

◆ Effective December 1, 2001, there were about 220 municipalities in Wisconsin for which UDC Inspection Agencies registered by S&B provide enforcement of the UDC. (Page 4 of this PDF.)

◆ In response to requests from municipal fire code officials, information has been developed by S&B to assist municipalities in the adoption by ordinance of the International Fire Code. Page 5 of this PDF.)

◆ Winter electrical education from the Wisconsin Association of Electrical Inspectors. (Page 7 of this PDF.)

◆ As we approach a major change in the Wisconsin Commercial Building Code, effective July 1, 2002, let's review the topics of plan submittal, code edition applicability, and plan approval expiration. (Page 8 of this PDF)

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Paper copies of the articles from Todd, Taylor, S&B Publications Editor, 608-267-3606.

# Wisconsin Building Codes Report

Safety and Buildings Division,  
Department of Commerce

January 2002

Order now your two-volume set of Comm 61 – 65, Wisconsin’s recently adopted new Commercial Building Code, with relevant provisions of the International Code Council model codes!



The new Wisconsin code goes into effect July 1, 2002

Each set costs \$200, including shipping and handling. The enrolled code has all the relevant provisions of the International Building Code, International Energy Conservation, International Mechanical Code, and International Fuel Gas Code, without unneeded text such as seismic maps for California or Hawaii, or climate maps for states other than Wisconsin. Be aware you may purchase from state Document Sales the Wisconsin Commercial Building Code without the model code provisions. Then, you can also purchase the national version of the model codes from some model code organizations. Costs in that instance may be greater in total.

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Send check for \$200 per set to the "Safety and Buildings Division,"  
Attn: Roberta Ward, PO Box 2689, Madison WI 53701

Do not buy the code through this offer if you are signed up to attend the 2002 Commercial Building code training being offered through the state inspector associations. Copies of the enrolled code will be included with the training tuition fee.

Personal information you provide may be used for secondary purposes [Privacy Law, s. 1504(1)(m)]

How many sets are you ordering? \_\_\_\_\_ (\$200 x number = check amount \_\_\_\_\_)

Company or individual name: \_\_\_\_\_

Shipping street address: \_\_\_\_\_

Special Instructions?: \_\_\_\_\_

City, state, zip: \_\_\_\_\_

Telephone number \_\_\_\_\_

Fiscal code 8035

## Articles on the S&B WebSite or available on paper

- ◆ Recommendations are made by the Fire Dues Task Group. (Page 9)
- ◆ Fire apparatus access under the new building code. (Page 10)
- ◆ Plan review worksheets, record forms, and guidelines for the review are being prepared for use with the new building code in July 2002. (Page 12)
- ◆ No-vent, ventless, and unvented fuel-fired space heating appliances are not allowed. (Page 13)
- ◆ Review of the fire resistive ratings for exterior walls and the maximum area of exterior wall openings under the new building code. (Page 14)

S&B WebSite: <http://www.commerce.state.wi.us/SB/SB-HomePage.html>

### Building Inspector - Zoning Administrator position:

- Mauston, (pop. 3700) seeks a Building Inspector-Zoning Administrator. Requires certification to perform UDC, electrical, plumbing and HVAC inspections. High school diploma or GED, and valid Wisconsin driver's license required. 2-5 years experience, broad knowledge in areas of residential construction and inspection, GIS mapping system experience preferred. Responsibilities include but not limited to, interpretation and enforcement of building codes and zoning ordinance; review plans and permit applications; perform inspections; administer and maintain files related to zoning and building; provide information and reports to staff and boards; monitor usage, coordinate updates, and provide assistance on City's GIS mapping system. Salary low to mid \$40's DOQ, with excellent benefits. Residency required. Complete position description and application form available upon request. Contact City of Mauston. Email [mausgov@mwt.net](mailto:mausgov@mwt.net), telephone 608-847-6676. Submit completed application, letter of introduction, resume, list of five professional work related references, salary history and requirements to: Building Inspector - Zoning Administrator Search, City of Mauston, 303 Mansion Street, Mauston, WI 53948-1329. Deadline: 4:30pm, Friday, February 1, 2002. Names are subject to release unless confidentiality is requested. Confidentiality not guaranteed for finalists. EOE.

**Two days in the Dells! for the design and construction community, January 29 and 30, 2002 at the Chula Vista Resort in Wisconsin Dells**

**Comprehensive training on topical aspects of the new commercial building code rules going into effect July 1, 2002 - Fire Systems, Egress, Fire Resistive Construction, Structural Stability, Energy, and Accessibility**

Cost is \$390 for the package, which includes an "enrolled" copy of the new *Wisconsin Commercial Building Code* ("Enrolled" means copy includes IBC provisions! A \$200 value!), class materials, break refreshments, resort single room the night of Jan. 29, lunch and dinner on Jan. 29, breakfast and lunch on Jan. 30. **AIA and inspector continuing education credits are offered.** Education without accommodations and meals is not being offered.

More info and the registration form were in the December *WBCR* or is on the Internet, <http://www.commerce.state.wi.us/SB/SB-CommercialBuildingsModelCodeAdoption.html>. Register by Jan. 3, 2002

# UDC inspection agency system went into place December 1

Effective December 1, 2001, there are about 220 municipalities in Wisconsin that now have enforcement of the Uniform Dwelling Code done by registered UDC Inspection Agencies. The UDC is the statewide building code for one- and two-family dwellings built since June 1, 1980.

Anyone building a new one-or two-family dwelling in these municipalities will have to obtain a Wisconsin uniform building permit from one of the agencies.

The agencies have the authority, on behalf of the state, to issue permits, perform plan reviews, request information from the permit applicant, perform inspections, ask for corrective actions, and collect fees to perform these functions. Individual property owners and builders may obtain a Wisconsin uniform building permit from any one of the registered agencies; therefore, more than one registered agency may simultaneously provide services in a municipality.

In 1999, state legislative action mandated that municipalities under 2500 in population revisit the question of whether or not they provided enforcement of the UDC. (Regardless of the enforcement status, UDC requirements still must

be followed in the dwelling's construction.)

The municipalities now using the inspection agencies are those that by the December 1, 2001 deadline neither chose to set up a system of enforcement nor declined enforcement. The lack of a local decision provided enforcement authority to the Safety and Buildings Division.

To make UDC enforcement available in these municipalities, S&B set up a system of registered UDC Inspection Agencies.

Lists of the municipalities and the inspection agencies are on the S&B WebSite, <http://www.commerce.state.wi.us/SB/SB-OneAndTwoFamilyProgram.html>. S&B will make every effort to make sure the information is up-to-date. It should be noted that municipalities might alter their decisions whether to set up their own system of enforcement or decline enforcement at any time. There may also be new registered inspection agencies.

For further information, you may contact Larry Swaziek, S&B UDC Program Manager, 608-267-7701, [lswaziek@commerce.state.wi.us](mailto:lswaziek@commerce.state.wi.us), or Brian Ferris, S&B Field Operations UDC Section Chief, 608-785-9335, [bferris@commerce.state.wi.us](mailto:bferris@commerce.state.wi.us).

# Municipalities may adopt the IFC by ordinance

by John Lippitt, S&B Fire Safety Program Manager, 608-266-1036, jlippitt@commerce.state.wi.us

In response to requests from municipal officials, the Safety and Buildings Division has developed information to assist municipalities which desire to adopt by ordinance part or all of the International Fire Code (IFC).

The IFC is part of the International Code Council's suite of model codes. Wisconsin recently adopted, effective July 1, 2002, the 2000 editions of the International Building Code (IBC), International Energy Conservation Code (IECC), International Fuel Gas Code (IFGC), and International Mechanical Code (IMC). (Note that this will not include IMC chapters relating to boilers, refrigeration, hydronic piping, or fuel oil. Current Wisconsin codes will continue for these subjects. Note also that Wisconsin's adoption will not include the fuel gas piping portions of the IFGC, but will rather continue to use NFPA 54, National Fuel Gas Code.)

Wisconsin's Fire Prevention Code, Comm 14, now adopts NFPA 1, Fire Prevention Code, in terms of building use and operation, also effective July 1, 2002.

In addition, specified design and construction requirements of the IFC apply where the IFC is referenced by one of the other adopted building codes. The IFC itself as a whole was not adopted with the codes mentioned above.

A municipality may adopt the entire IFC by ordinance. There is an option in the new Comm 14.004(1)(b) for a municipality to request a special order from S&B to use the IFC in lieu of NFPA 1 to regulate the operation and use of buildings and premises.

Part of the understanding reached with members of Wisconsin's Fire Service regarding the adoption of the model codes involved separation of authority between Wisconsin's Fire

Prevention Code and the Commercial Building Code.

The understanding specifies that the building code regulates the design and construction of buildings and the fire code regulates the operation and use of buildings and premises, and the maintenance of fire safety features.

There is a local option to use the IFC in lieu of the NFPA 1 for regulating building operation, use, and maintenance. A municipality may decide if they are going to follow that option, or if they are going beyond that and choose to adopt the IFC to also regulate building design and construction within that municipality.

The new Comm 14.004(1)(b), lists the following IFC chapters that must be adopted by ordinance prior to a municipality requesting the special order: IFC Chapters 3 to 10, 12 to 21, 23 to 29, 36, and 39 to 42. This list contains the minimum portions of the IFC that must be adopted. There is no maximum; a municipality may choose to adopt additional chapters, or the entire IFC.

When a municipality considers the option to adopt the IFC by ordinance, I suggest someone read the code book cover to cover. This provides the opportunity to flag requirements in the IFC that may be especially important locally. Also, there may be provisions in the IFC that do not fit the local picture; these provisions could be amended in the local ordinance.

Chapter 1 of the IFC is titled "Administration." As part of the adoption process, a municipality must decide if they will be using the administrative provisions of the IFC. Careful consideration must be given to IFC Chapter 1, as

continued on next page

## IFC adoption by municipalities

continued from previous page

it specifies requirements for the public, property owners, the municipality, and code officials. For example, IFC Section 108 requires a board of appeals be created by the governing body.

The municipality must make the decision to either adopt IFC Chapter 1 with amendments, or to specify that Chapter 1 is not included in the adoption, except for those specific sections that the municipality may choose.

To help in identifying issues in the IFC that may need to be amended in an ordinance, S&B can provide a copy of the draft Comm 66, Wisconsin Fire Prevention Code, which proposed the adoption of the IFC. Comm 66 was put aside as a proposed code as a result of the decision to adopt the NFPA 1 in Comm 14. (See below.)

The draft Comm 66 will show what amendments S&B staff felt were needed in Wisconsin to accompany the adoption of the IFC. For example, see Comm 66.0010. Note that Comm 66 was intended to be a complete fire code, including design and construction

requirements to accompany the IBC. I think the majority of the amendments to the IFC which should be considered locally are located from section 66.0201 to section 66.4600 of the draft.

Some of the provisions in Comm 66 follow statutory requirements, or prohibitions; for those issues there may be no amendments via a local ordinance.

The scope of the IFC is broader than the scope of Comm 14, the Wisconsin Fire Prevention Code. The IFC regulates many subjects that are currently regulated by other Comm codes. To avoid having conflicting rules, S&B excluded some chapters of the IFC in the Comm 66 draft. A municipality must make a decision whether to adopt those IFC chapters, or to exclude those chapters in the ordinance and use the other Comm codes. For example: Comm 66.3400 excludes IFC Chapter 34, regarding flammable and combustible liquids from the code. A note directs the user to Comm 10, the Wisconsin Flammable and Combustible Liquids Code. The new Comm 14 has also been amended, as described above, to exclude the NFPA 1 chapters that are regulated by the other Comm codes.

PDF file: <http://www.commerce.state.wi.us/SB/SB-CommercialBuildingsModelCodeAdoptionDraft66.pdf>

HTML file: <http://www.commerce.state.wi.us/SB/SB-CommercialBuildingsModelCodeAdoptionDraft66.Html>

For electronic versions of electrical continuing education brochure, see

PDF file: <http://www.commerce.state.wi.us/SB/SB-ElectricalConEdBrochure02.pdf>

Word 97 file: <http://www.commerce.state.wi.us/SB/SB-ElectricalConEdBrochure02.doc>

# Notes on building plan submittal, code edition applicability, and approval expirations

by Tom Kasper, S&B Bureau of Integrated Services Section Chief, 608-267-7586,  
tkasper@commerce.state.wi.us

As we approach a major change in the Wisconsin Commercial Building Code, with national model code provisions effective July 1, 2002, I think it's useful to review the topics of plan submittal, code edition applicability, and plan approval expiration.

**Retroactivity** - Per Comm 50.02 (new Comm 61.03), newly adopted code requirements are generally not retroactive to existing buildings or to approved plans prior to the plans' approval expiration date.

**Code Applicability** - The code in effect at the time of valid plan submittal is the code that will be used to review and approve the submittal. For a new building or building addition, valid plan submittal could be a viable building plan submittal, or a footing and foundation plan submittal. Note that a preliminary review does not qualify as a submittal that determines code applicability. You can't beat the deadline for submittal under the current code with bad plans. Sketchy, incomplete, code non-compliant, un-dimensioned, or inconsistent plans will not be considered viable. Re-submittal is under the code in effect at the time of the re-submittal.

**"Additional Information" Plan Review Action**  
- If incidental or moderate problems are found during a plan review, the reviewer will take a plan review action of "Additional Information." If the requested information is submitted within 30 days, the plans will continue to be reviewed under the original code. If the information is not received within 30 days, the reviewer will close the submittal. Subsequent re-submittal will be subject to the code in effect at the time of re-submittal.

**Plan Approval Expiration** - Per Comm 50.17 (Comm 61.36), plan approval is valid for:  
- New buildings or additions for two years for

the shell and an additional year for interior work.

- Alteration plans for one year.
- HVAC plans, that are not associated with a building construction approval, for one year.

(Be aware that municipalities have the statutory authority to condemn construction projects that have not progressed for two years.)

**Footing and Foundation Approval** - A footing or foundation approval is normally valid for three years, and runs concurrently with the subsequent building plan approval.

**HVAC Plans Related to Building Construction Projects** - If a project has building construction plans submitted, and then later has related HVAC plans submitted separately, the expiration of the HVAC plan approval could be the end of the three-year building approval or a one-year approval period. Normally, the HVAC plans may comply with the code in effect at the time of original building construction submittal. However, if the submitter desires HVAC approval to go beyond the original building approval period, the plans must comply with the HVAC code in effect at the time of HVAC submittal.

**Plan Approval Extensions** - Per Comm 50.17 (Comm 61.36), prior to original plan approval expiration, an owner may apply for a single one-year plan approval extension for the interior work, with the payment of a \$100 fee. If the relevant code sections have changed by the time of application for plan approval extension, then the owner must also submit a \$150 plan revision submittal fee and revised plans showing compliance with the new code for those portions of the project not yet completed. Plan approval extensions are not available for a building shell.

**Revisions** - Revisions within the scope of the

original project may be submitted prior to plan approval expiration showing compliance with the code in effect at the time of original submittal. Approval of the revision does not extend the expiration date of the approved plans.

**Tenant Space Alteration Plans** - In the case of a multi-tenant building, the initial and subsequent tenant space alteration plans are subject to the code in effect at the time of submittal of that tenant space plan, not the original building shell.

Plan approval letters issued by the Safety and Buildings Division currently indicate the plan approval expiration date. They will also in the future indicate if the project was reviewed to the

July 1, 2002 code provisions, so that all parties are clear which code to apply.

As with any code requirements, the code applicability and approval expiration dates I report above may be petitioned. S&B is currently approving petitions that request the use of the new code provisions in advance of the official effective date, based on the thought that the new code results in an equivalent or greater level of safety. Likewise, an owner may petition to extend an approval under the current Wisconsin codes beyond the normal limits. Justification for approval could include the demands of large-scale, long-term integrated projects which would be difficult to adjust to a mid-project code change.

Recommendations were made by the Fire Dues Task Group: See November 12, 2001 meeting summary, <http://www.commerce.state.wi.us/SB/SB-FireSafetyTaskGroup.html>.

# Fire apparatus access and fire lanes

For more information on this subject, contact S&B Commercial Building Plan Reviewer Larry Stilen, 262-548-8607, Lstilen@commerce.state.wi.us

With the adoption of a new Wisconsin Commercial Building Code, including amended provisions of the International Building Code (IBC), I would like to discuss the requirements for fire apparatus access.

The requirements for building frontage street exposures as we are currently accustomed to using them will be changing July 1, 2002, when we begin to use the IBC provisions.

Within Comm 62 and the IBC there are requirements for fire lanes and access to public ways:

√ Section 506.2 states that every building shall adjoin or have access to a public way to be eligible to use the area increase for frontage exposures.

√ Section 506.2.2 states that open spaces used for area increases for frontage exposures shall be on the same lot or dedicated for public use and shall be accessed from a street or fire lane.

√ Section 507, dealing with unlimited area buildings, provides width requirements for public ways and open spaces for various occupancy group buildings.

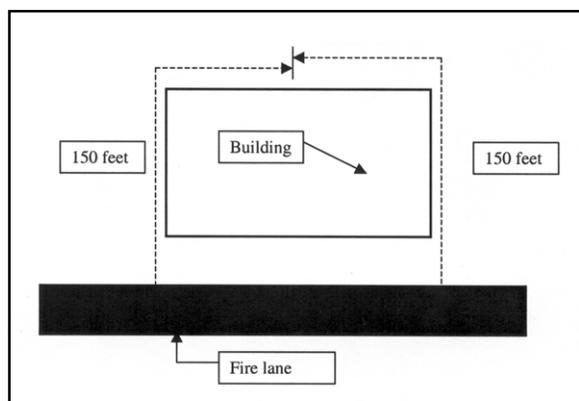
The requirements for fire apparatus access and fire lanes are found in Comm 62.0500 of the new Commercial Building Code.

All facilities, buildings and portions thereof are required to have unobstructed fire lanes provided that are accessible from a public road. The fire lane is required to extend to within 150 feet of all portions of the exterior wall of the first story of the building. There is an exception to the 150 feet distance limitation. Comm 62.0500(2)(b) states that upon acceptance by the fire code official, the 150 feet distance may be increased where one of the following requirements are

satisfied:

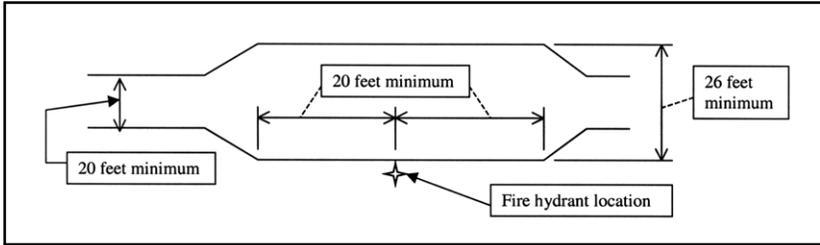
1. Building is equipped throughout with an approved automatic fire sprinkler system, or

2. Code-complying fire lane cannot be installed due to location on property, topography, waterways, or other similar conditions, and an alternative means of fire protection is provided to the building.



Fire lanes must be provided with a minimum unobstructed vertical clearance of 13 feet 6 inches, and an unobstructed width of not less than 20 feet. An exception to the 20-foot width requirement is provided within Comm 62.0500(3)(d). Where a fire hydrant is provided to supply fire apparatus on the fire lane, the minimum width of the fire lane must be 26 feet for a minimum distance of 20 feet on each side of the fire hydrant.

The minimum inside turning radius of a fire lane must be not less than 28 feet, or as determined by the fire code official. All fire lanes with a dead-end greater than 150 feet in length are to be provided with an area for turning around the fire apparatus. Comm 62.0500(5) gives three acceptable methods of providing the turnarounds.



When any part of a building is greater than 30 feet above the lowest level of fire apparatus access, additional requirements in Comm 62.0500 must be complied with.

1. A cul-de-sac with a 70-foot minimum diameter,
2. A 45-degree wye with a minimum length of 60 feet per side, or
3. A 90-degree tee with a minimum length of 60 feet per side.

All fire lanes are to be surfaced to provide all-weather driving capabilities and are to be designed, installed, and maintained to support the imposed loads of the fire apparatus. Any bridge or elevated surface used as a portion of the fire lane must be designed for a live load sufficient to carry the fire apparatus. The grade of the fire lane must be approved by the fire code official and will be based on site topography and the fire department's apparatus. Fire lanes are to be provided prior to the placement of combustible materials at the building site or before the construction of any portion of a building above the footing and foundations.

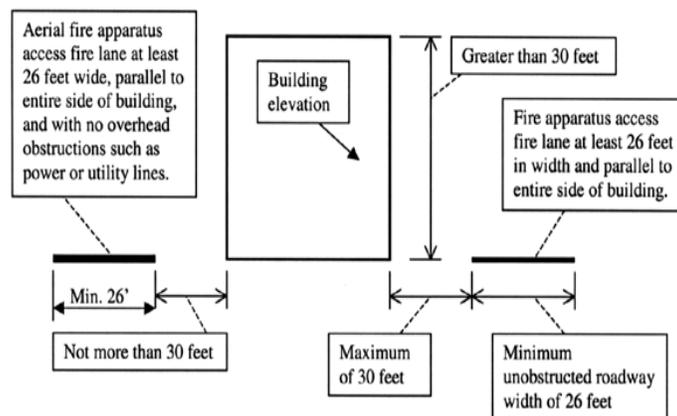
- Fire lane is to be parallel to one entire side of the building with the near edge of the fire lane within 30 feet of the building on that parallel side,

- A fire lane capable of accommodating aerial fire apparatus is to be provided with no overhead power or utility lines located over or within the fire lane, and

- The fire lane parallel to one side of the building must be provided with a minimum unobstructed width of 26 feet.

For additional information on fire apparatus access and fire lane requirements, please refer to Comm 62.0500. Electronic versions of the most recent drafts of the Wisconsin Amendments are available via a link on S&B's website, <http://www.commerce.state.wi.us/SB/SB-CommercialBuildingsModelCodeAdoption.html>.

As an example, see the elevation detail below.



# Worksheets, forms, and guidelines are tools for improving building plan reviews

by Henry Kosarzycki, Safety and Buildings Division Agent Monitor,  
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Adoption of the new Wisconsin Commercial Building Code has given us the opportunity to reappraise the building plan review process, as well as consider development of new “tools.” The Safety and Buildings hopes the new tools – worksheets, forms, and written guidelines - might provide efficient and structured processes for state plan review staff, as well as plan review agents.

Following a process the division called “Quality, Quantity and Time,” S&B in the past developed a standard checklist to use to schedule and carry out plan reviews. The “QQT” process and checklist also have been useful parameters for some plan review agents.

With the adoption of the new Wisconsin codes came the task of revising the current “QQT” checklist and process. Not only are new checklists being developed, but worksheets, plan review record forms, and guidelines for the review are also being prepared for implementation in July 2002.

S&B hopes to establish for our staff a standard structured format specific to the commercial plan review task. We hope agents will be able to use the tools we develop.

The agent audit system that I am now leading

has been a solid first step towards establishing a standard model for plan review. One of the challenges has been to address what may be a slightly different systems for completing the same task in each agent municipality. More than thirty years of delegated agent plan review, coupled with second or third generation procedures on S&B’s part, has contributed to some inconsistency.

July 2002 brings with it a new code, and a new opportunity for a standard and efficient review process that can be used statewide. The design community, as well as the regulatory community, can work toward commonalties to allow all of us to speak one language.

S&B anticipates providing our inspectors in February with an introduction to revised QQT worksheets and plan review records. In April, some training is proposed at the inspectors institute meetings, followed by continued training via the four Wisconsin Building Inspector Associations.

I think we should be proud of our current system of building plan review and regulation in Wisconsin. Our statewide review and inspection process rivals most other states. With our foundation, we can work on implementing a structured process to provide not only efficient, but consistent and comprehensive plan review services.

# No-vent, ventless, and unvented space heating appliances are not allowed

by Randy Dahmen, S&B Commercial Buildings Plan Reviewer,  
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At the start of every heating season, there is a “heat wave” of public inquiry as to the status of no-vent, ventless, and unvented fuel-fired space heating equipment. This type of equipment is usually fueled by kerosene, natural gas, or alcohol. Merchants sell these appliances to the public in the form of fireplaces, wall heaters, etc.

Designers, building inspectors, and buildings owners are reminded that these units are **not** allowed to be installed in the majority of the occupancies associated with commercial buildings or in many residential buildings.

Use of such heaters is prohibited because the heaters deplete oxygen and can cause a buildup of carbon monoxide and moisture in the room. Further, the liquid fueled heaters require frequent refueling, which can lead to spillage and additional fire hazard.

Comm 64.22(5)(c) prohibits such heaters. Only those equipment types used in the occupancies specified in Comm Table 64.21 are allowed in commercial buildings. The newly adopted Wisconsin Building Code, to be implemented on July 1, 2002, maintains the prohibition via Comm 65.0620.

The new adopted Fire Prevention Code, Comm 14.06(4) also prohibits portable unvented fuel-fired heaters except during construction or demolition of a building.

The Uniform Dwelling Code (UDC), prohibits such heaters in Comm 23.04(1)(b). The UDC is limited in application to one- and two-family residential buildings built in 1980 or later, unless the local municipality has adopted an ordinance to apply the UDC code to those residences built before 1980.

Under the UDC code, an attached garage is considered part of the dwelling, therefore the garage would be subject to the unvented heater prohibition. The units are not prohibited by the UDC in detached garages. However, most municipalities have their own regulations covering construction of accessory buildings. Anyone proposing to use such equipment in a detached garage should always check with the local officials.

Farm buildings that are not addressed by either building code may use such equipment.

# Exterior Wall Fire Rating and Allowable Openings

For more information on this subject, contact S&B Commercial Building Plan Reviewer Larry Stilen, 262-548-8607, Lstilen@commerce.state.wi.us

With the adoption of the new Wisconsin Commercial Building Code, Comm 61 - 65, the fire resistive ratings for exterior walls and the maximum area of exterior wall openings change.

Provisions of Chapter 6 of the International Building Code, adopted as part of the new Wisconsin Commercial Building Code, addresses types of construction. Within the type of construction requirements, in Tables 601 and 602, there is direction for fire resistive ratings of exterior walls. These ratings for exterior walls are based on the type of construction of the building, type of wall (bearing or non-bearing), fire separation distances, and on the occupancy group(s) of the building.

## General procedure for determining fire resistance ratings for exterior walls:

- Determine use and occupancy classification for the building (discussed in November 2001 *WBCR*, IBC Chapter 3);
- Determine proposed class of construction of the building (discussed in December 2001 *WBCR*, IBC Chapter 6);
- Determine fire separation distances for all exterior walls, discussed below;
- Determine if exterior walls are bearing walls or non-bearing walls; and
- Determine fire resistance ratings for exterior walls based on Tables 601 and 602 of the IBC. The most restrictive requirement of the rating requirements must be complied with.

## Determination of Fire Separation Distances

Fire separation distance is the distance measured from the building face to the closest interior lot line, to the centerline of a street, alley or public way, to a recorded no-build easement line, or to an imaginary line between two buildings on the same property. Fire separation

distances are measured at right angles to the property lines or other specified line.

Section 704.3 of the IBC deals with buildings on the same property and buildings containing courts. Multiple buildings on the same site and court walls of buildings over one story in height shall be assumed to have a property line provided between them, except as follows:

- Two or more buildings on the same property can be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 (General Building Heights and Areas) for a single building. If the buildings contain different occupancy groups or are of different construction classes, then the associated area with the most restrictive occupancy or construction class controls.
- Court walls complying with all three of the following conditions do not require protected wall and opening construction:
  - Not more than two levels open into the court,
  - The aggregate area of the building, including the court, is within the allowable building area, and
  - The building is not classified as Group I.

Where two or more buildings on the same property are regulated as separate buildings with no established property line or lot line provided between the buildings, an imaginary line has to be established which is used to measure the fire separation distance from each wall of the buildings.

Section 704.5 of the IBC requires that the fire resistance rating of exterior walls with a fire separation distance greater than five feet shall be rated for exposure to fire from the inside. The fire resistive rating of exterior walls with a fire separation distance of five feet or less shall be rated for exposure to fire from both sides.

## Determination of Allowable Openings

The maximum area of protected and unprotected wall openings permitted in an exterior wall in any story shall not exceed the values stated in Table 704.8. Note that the wall openings are considered on a story by story basis and not on the entire wall area basis. Where both protected and unprotected wall openings are located in the exterior wall in any one story, the total area of the openings shall comply with the following formula:

$$(A/a) + (A_u/a_u) \leq 1.0$$

(Equation 7-2)

A = actual area of protected openings,  
a = allowable area of protected openings,  
A<sub>u</sub> = actual area of unprotected openings,  
a<sub>u</sub> = allowable area of unprotected openings.

For all occupancy groups other than Group H-1, H-2, and H-3 occupancies, unprotected openings are permitted to have an allowable area equal to the tabulated limitations for protected openings when the building is completely protected by an automatic fire sprinkler system per Section 903.3.1.1(NFPA 13).

In occupancies other than Group H, unlimited unprotected openings are permitted in the first story of exterior walls facing a street that has a fire separation distance of greater than 15 feet or facing an unoccupied space. The unoccupied space shall be on the same property or dedicated for public use, not less than 30 feet in width, and provided with access from a posted fire lane.

Openings in exterior walls in adjacent stories shall be separated vertically to protect against fire spread on the exterior of the building where the openings are within five feet of each other horizontally and the opening in the lower level is

Table 704.8-Maximum area of exterior wall openings

Classification of opening	Fire separation distance (feet)							
	0 to 3	> 3 to 5	> 5 to 10	> 10 to 15	> 15 to 20	> 20 to 25	> 25 to 30	Over 30
Unprotected	N.P.	N.P.	10%	15%	25%	45%	70%	100%
Protected	N.P.	15%	25%	45%	75%	100%	100%	100%

(Please note that for the above table all references to the footnotes within the table were deleted for clarification purposes. Please refer to actual tables in the International Building Code.)

“Story” is defined in section 202 of the IBC as that portion of a building included between the upper surface of a floor and the upper surface of a floor or roof next above. It is measured as the vertical distance from top to top of two successive tiers of beams or finished floor surfaces. For top-most stories, it is measured from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.

not a protected opening. Openings shall be separated vertically by a minimum of three feet of construction having at least a one-hour fire resistance rating or by flame barriers having at least a one-hour fire resistive rating that extend horizontally at least 30 inches beyond the exterior wall. Refer to Section 704.9 of the IBC for the specific requirements.

Vertical separation is not required when the building is not more than three stories in height, or completely protected by an automatic fire sprinkler system per 903.3.1.1 (NFPA 13), or the building is an open parking garage.

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# Exterior Wall Fire Rating and Allowable Openings

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Section 704.10 of the IBC requires that protection for openings less than 15 feet vertically above the roof of an adjoining building or an adjacent structure that is within a horizontal fire separation distance of 15 feet of the wall in which the opening is located. This section only applies to buildings on the same property. Protected openings are not required when the roof construction has a fire-resistance rating of not less than one-hour for a minimum distance of 10 feet from the adjoining structure. The entire length and span of the supporting elements for the fire resistive rated roof assembly shall have a fire resistive rating of at least one-hour.

## Parapet Requirements

The general requirement stated in Section 704.11 is that parapet walls are required for exterior walls of buildings. Parapet walls are required to have the same fire resistive rating as the supporting wall. Within this section there are, however, numerous exceptions that allow exterior walls to be constructed without a parapet.

Some examples of when a parapet wall is not required are when:

- Exterior wall are not required to be fire-resistive rated per Table 602 due to fire separation distances,
- Building has an area not greater than 1000 square feet on any floor,
- Walls terminate at roof of not less than two-hour fire resistive rated construction, or where the roof, deck, and supporting elements are entirely of noncombustible construction,
- See code for specific parapet wall exception for a one-hour fire resistance rated exterior wall terminating at the underside of roof sheathing, deck, or slab,
- See code for specific parapet wall exception for occupancies of Groups R-2 and R-3, and
- Exterior wall is permitted to have at least 25 percent of the wall area to be of unprotected openings based on the location from a lot line as determined per section 704.8.

Windows required to be protected in accordance with Sections 704.8, 704.9, or 704.10 must comply with the requirements of Section 714.3.7. Other openings required to be protected in accordance with Sections 704.8, 704.9, or 704.10 must comply with the requirements of Section 714.2.