

AIA
Wisconsin
*A Society of The American
Institute of Architects*



WCBC UPDATE

2008 Energy Provisions

AIA Southwest WI Chapter

CSI – Madison WI Chapter

27 March, 2008

James B. Smith, P.E.

Program Manager

(608) 266-0251 – Jim.Smith@wi.gov

What Is the Session About?

- **Significant Changes to the Energy Provisions of the Wisconsin Commercial Building Code [WCCB]**
- **Note the use of 2006 Editions of:**
 - **International Building Code (IBC), International Energy Conservation Code (IECC), International Mechanical Code (IMC), International Fuel Gas Code (IFGC) & the International Existing Building Code (IEBC)**

What's in the "new" WCBC

Soil Erosion

Ch. Comm 60

Administration

Ch. Comm 61

Building

Ch. Comm 62

Energy

Ch. Comm 63

Mechanical

Ch. Comm 64

Fuel Gas

Ch. Comm 65

Existing Building

Ch. Comm 66

Insert Pages 2008 WCBC Modifications

Questions or Suggestions?

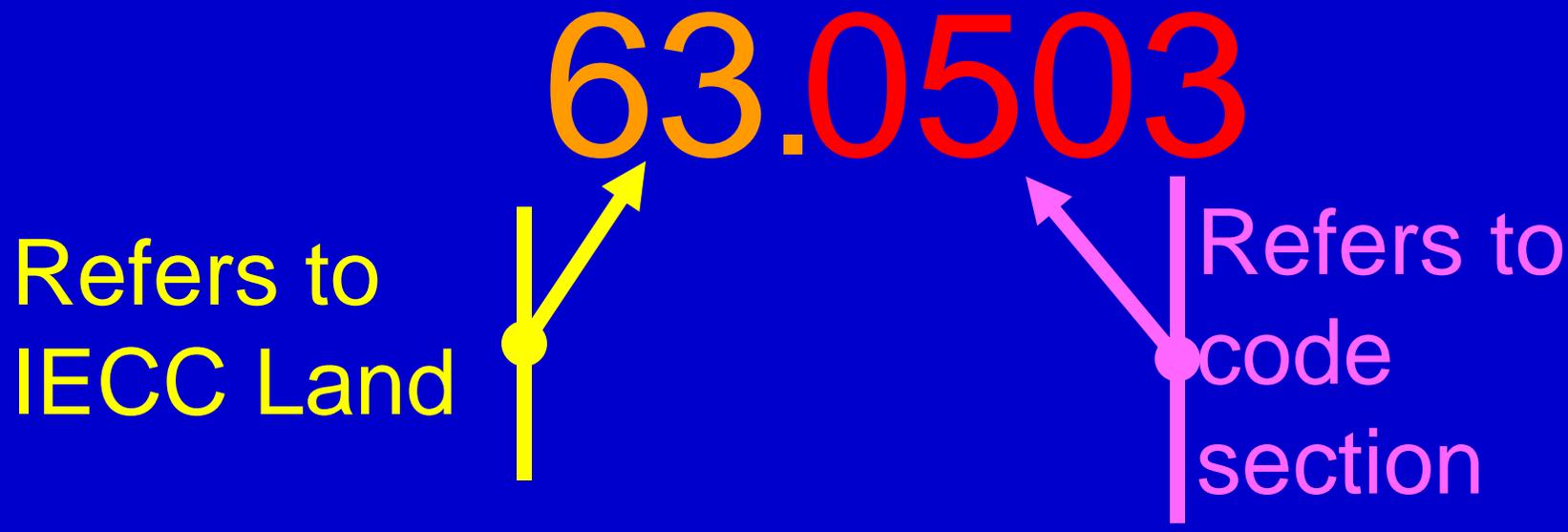
Contact - James B. Smith, P.E. – Program Mgr.

(608) 266-0251

jsmith@commerce.state.wi.us

WCBC Navigating Wisconsin Modifications

- There is a *Method to the Madness* of the Admin. Rule Numbering



Insert Pages

- **An insert page (or pages) was created for each group of Wisconsinisms that occur on any set of two facing ICC pages.**
- **Pages titles correspond to the ICC Code & Chapter being modified**

Insert Pages (cont)

- **Following the title, a sentence tells users the page numbers of the model code where the insert is to be placed.**
- **Insert Pages are also numbered (i.e. Page 1 of 2) so users will know if there is more than 1 page to be inserted at that location .**

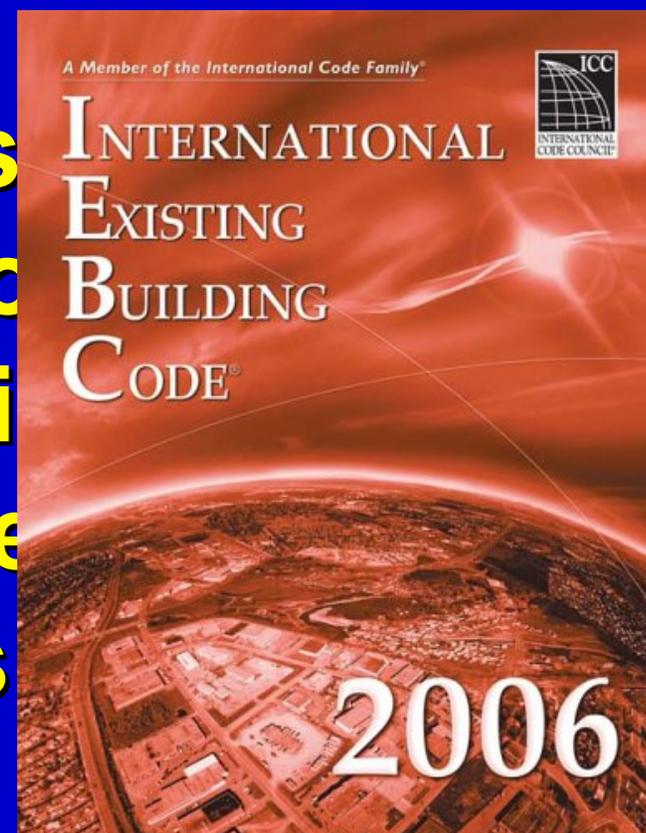
INSERT PAGES
IBC CHAPTER 4

To be inserted between pages 18 & 19.

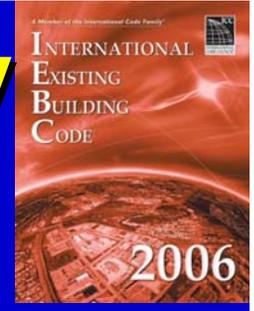
Comm 63.0401 Certificate. The requirements in IECC section 401.3 are not included as a part of this code.

General Changes to the WI Comm. Bldg. Code (WCBC)

- **Must use the IEBC
[Comm 66] for repairs,
alterations, changes of
use, additions, historical
buildings and relocated
commercial buildings**

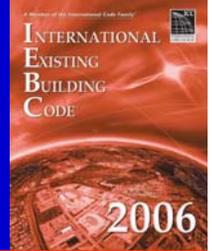


Exist'g Bldg's & Energy Conservation



- [Comm 66.0607] Addn's, altn's, or repairs are to conform to the provisos of the IECC as they relate to new construction without requiring the unaltered portions of the existing building or bld'g system to comply.
- The work cannot create an unsafe/hazardous cond'n or overload existing building systems.
- **NOTE THE EXCEPTIONS**

Comm 66.0607 (cont)



- **THE EXCEPTIONS.** The following items do not have to comply as long as the energy use of the bld'g is not increased:
- Storm windows over exist'g windows.
- Glass replacement in an existing sash & frame.
- Exist'g ceiling/wall/floor cavities exposed during construction as long as the cavities are already insulated.
- Construction where the existing roof, wall or floor cavity is not exposed.

General Changes to WCBC (cont.)

- **Although many of the current Wisconsinisms are dropped, be aware that the associated requirements likely still exist in the newer edition of the code.**

WSCBC/IBC CH. 13

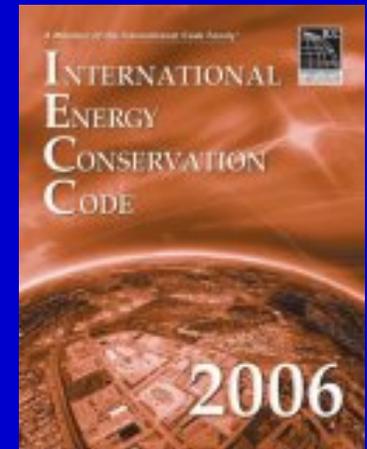
WCBC/IBC Chapter 13



**Energy
conservation
IECC**

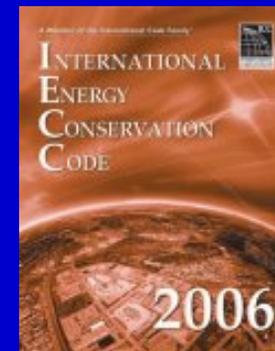
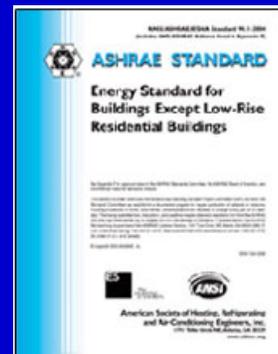
International Energy Conservation Code (IECC - 2006) Breakdown

- **Ch. 1 Administration**
- **Ch. 2 Definitions**
- **Ch. 3 Climate Zones**
- **Ch. 4 Residential Energy Efficiency**
- **Ch. 5 Commercial Energy Efficiency**
- **Ch. 6 Reference Standards**



Changes to the Energy part [IECC] of WCBC

- **Significantly reduced the no. of WI mod's. regarding the IECC [Comm Chapter 63]. Comm 63 Subchapter III – No longer in existence**





Late Breaking News

- Heated Sidewalks to No Longer be Prohibited [was COMM 63.0102(1) & 101.124 Stats]
- Law changed on March 26, 2008



Lighting Provisions

IECC Ch. 4, IBC 1006 & 1011, IMC
306.3.1

- There are **NO** energy efficiency reqmt's. for lighting of Low-Rise Residential Buildings
- Other WCBC reqmt's. for exit signage, means of egress illumination, access & service lighting, etc., remain in place.

WCBC/Energy [IECC] Changes (cont.)

- Simplified prescriptive envelope reqmts. for low-rise Res. Bldgs.
- No limit on the amount of glazed openings. [IECC s. 402.1]
- New residential performance alternative section [IECC s. 404]



Computerized Compliance Tools

Comm 63.0404, Comm 63.0506, & IECC 501.1/ASHRAE 90.1

- Use “2006 IECC” or “90.1 (2004 ASHRAE) Std” as the code criteria for both programs



COMcheck-Web™

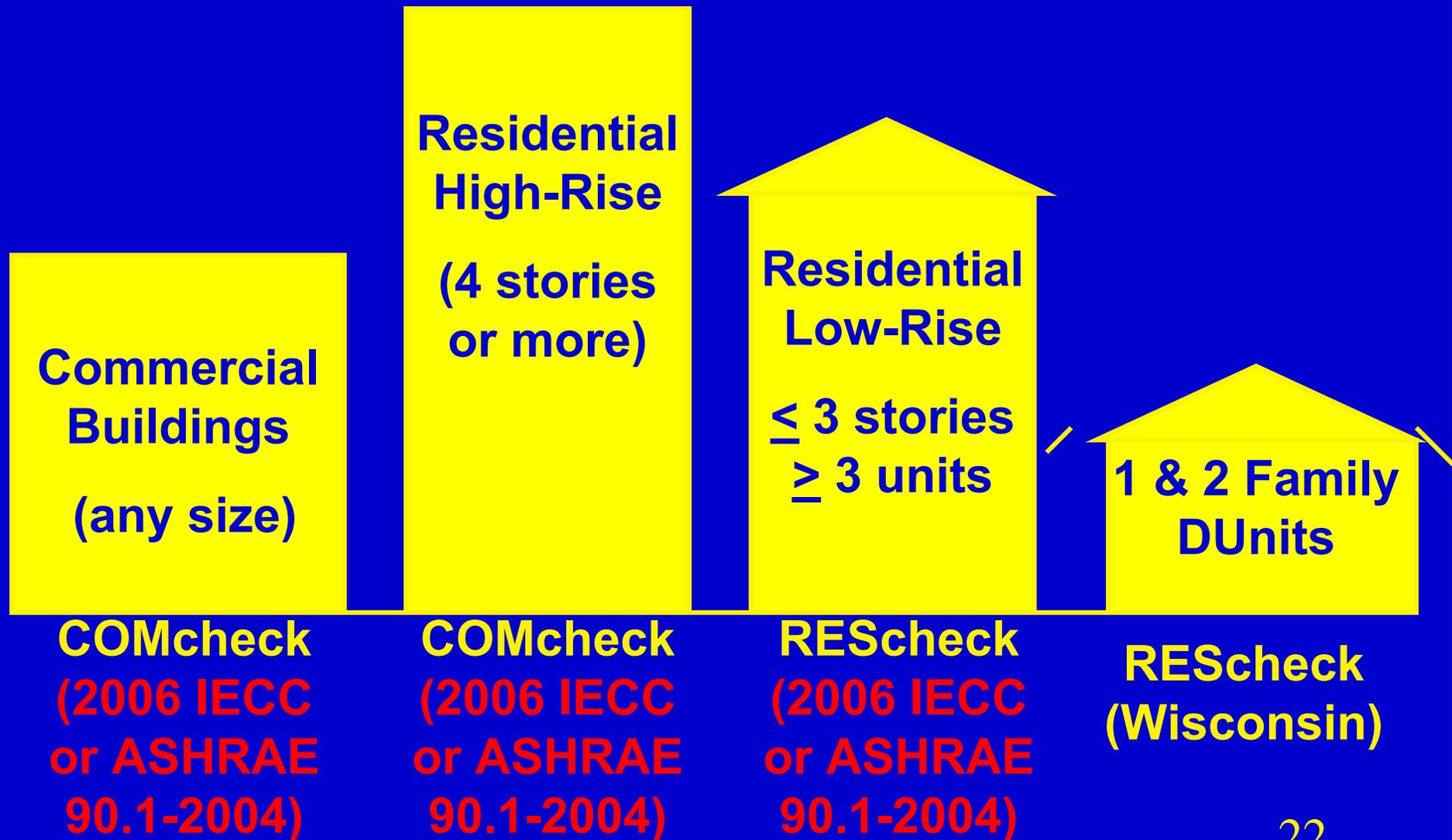
Select Code & Location:

Code: 2006 IECC or 90.1 (2004) Standard

State: Wisconsin

City: As located (or closest listed municipality)

Computerized Compliance Application (Code Criteria)



Unique Building Designs can still meet the Energy Provisions



- This building passes by using low-U glazing, and extra insulation on the Roof, Side and Back Walls

Prescriptive Compliance

IECC Table 502.2(1) – Prescriptive Opaque Envelope Requirements

TABLE 502.2(1)
BUILDING ENVELOPE REQUIREMENTS – OPAQUE ASSEMBLIES

CLIMATE ZONE	1	2	3	4 except Marine	5 and Marine 4	6	7	8
Roofs								
Insulation entirely above deck	R-15 ci	R-15 ci	R-15 ci	R-15 ci	R-20 ci	R-20 ci	R-25 ci	R-25 ci
Metal buildings (with R-5 thermal blocks ^{a,b})	R-19 + R-10	R-19	R-19	R-19	R-19	R-19	R-19 + R-10	R-19 + R-10
Attic and other	R-30	R-30	R-30	R-30	R-30	R-30	R-38	R-38
Walls, Above Grade								
Mass	NR	NR	R-5.7 ci ^{c,e}	R-5.7 ci ^c	R-7.6 ci	R-9.5 ci	R-11.4 ci	R-13.3 ci
Metal building ^b	R-13	R-13	R-13	R-13	R-13 + R-13	R-13 + R-13	R-13 + R-13	R-13 + R-13
Metal framed	R-13	R-13	R-13	R-13	R-13 + R-3.8 ci	R-13 + R-3.8 ci	R-13 + R-7.5 ci	R-13 + R-7.5 ci
Wood framed and other	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13 + R-7.5 ci

Prescriptive Compliance

IECC Table 502.2(1) – Prescriptive Opaque Envelope Requirements

Walls, Below Grade								
Below grade wall ^d	NR	NR	NR	NR	NR	NR	R-7.5 ci	R-7.5 ci
Floors								
Mass	NR	R-5 ci	R-5 ci	R-10 ci	R-10 ci	R-10 ci	R-15 ci	R-15 ci
Joist/Framing	NR	R-19	R-19	R-19	R-19	R-30	R-30	R-30
Slab-on-Grade Floors								
Unheated slabs	NR	NR	NR	NR	NR	NR	NR	R-10 for 24 in. below
Heated slabs	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-7.5 for 24 in. below	R-10 for 36 in. below	R-10 for 36 in. below	R-10 for 48 in. below
Opaque Doors								
Swinging	U – 0.70	U – 0.70	U – 0.70	U – 0.50				
Roll-up or sliding	U – 1.45	U – 0.50	U – 0.50	U – 0.50				

For SI: 1 inch = 25.4 mm.
 ci – Continuous Insulation
 NR – No Requirement

- a. Thermal blocks are a minimum R-5 of rigid insulation, which extends 1-inch beyond the width of the purlin on each side, perpendicular to the purlin.
 b. Assembly descriptions can be found in Table 502.2(2).

Zones 6 & 7

Roof R-value

Section 502.2.1



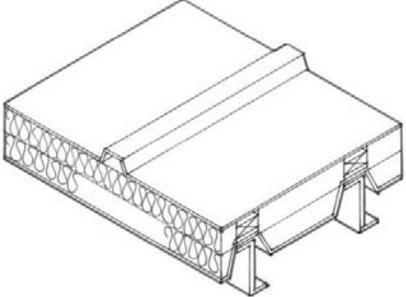
- Roof R-value
 - Requirements Based on Assembly Type/ Insulation Placement
 - Insulation entirely above deck
 - Metal buildings
 - Attic & other
 - Table requirements list insulation R-value

If using COMcheck – Enter insulation R-values only – framing accounted for by roof type

Roof R-Values

Table 502.2(2) - Metal Bldg. Assembly Descriptions

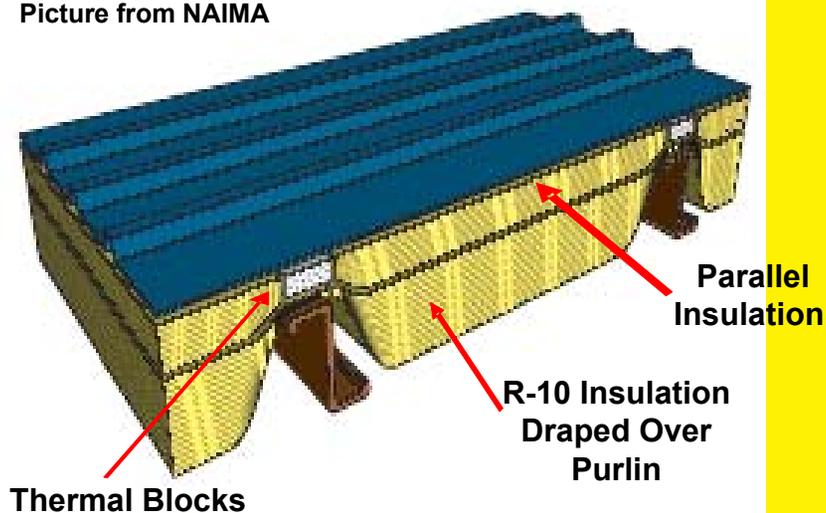
TABLE 502.2(2)
METAL BUILDING ASSEMBLY DESCRIPTIONS

ROOFS	DESCRIPTION	REFERENCE
R-19 + R-10	<p>Filled cavity roof.</p> <p>Thermal blocks are a minimum, R-5 of rigid insulation, which extends 1 in. beyond the width of the purlin on each side, perpendicular to the purlin.</p> <p>This construction is R-10 insulation batts draped perpendicularly over the purlins, with enough looseness to allow R-19 batt to be laid above it, parallel to the purlins. Thermal blocks are then placed above the purlin/batt, and the roof deck is secured to the purlins. In the metal building industry, this is known as the “sag and bag” insulation system.</p>	<p>ASHRAE/IESNA 90.1 Table A2.3</p> 
R-19	<p>Standing seam with single insulation layer.</p> <p>Thermal blocks are a minimum R-5 of rigid insulation, which extends 1 in. beyond the width of the purlin on each side, perpendicular to the purlin.</p> <p>This construction R-19 insulation batts draped perpendicularly over the purlins. Thermal blocks are then placed above the purlin/batt, and the roof deck is secured to the purlins.</p>	<p>ASHRAE/IESNA 90.1 Table A2.3</p>

Roof R-value

- Metal Buildings
 - R-5 thermal blocks required on all metal buildings
 - Zone 6 = R-19
 - Zone 7 requires two layers of insulation:
(R-19 + R-10)
 - R-10 draped perpendicularly to the purlins
 - R-19 running parallel to the purlins supported by the R-10

Picture from NAIMA



If using COMcheck –
“Standing Seam” Roof

Wall R-value

Section 502.2.3



- **Examples**
 - 4" Concrete walls @115 lb/ft³
 - 8" CMU Block

If using COMcheck – You only have to know the wall thickness or type of block

- **Mass walls**
 - Walls weighing \geq 35 lbs/ft² of wall surface area, or
 - 25 lbs/ft² of wall surface area if material weight is \leq 120 lb/ft³
 - Zone 6 = R-9.5 (ci)
 - Zone 7 = R-11.4 (ci)

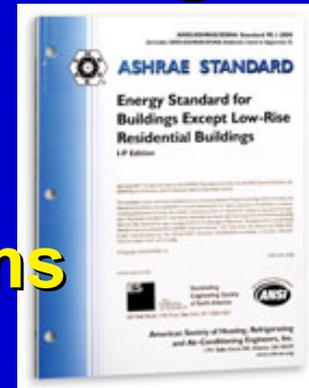
Wall R-Value

- **Wood Walls:**
 - Zone 6 & 7 = R-13
- **Metal Framed (stud) Walls:**
 - Zone 6 = R-13 + R-3.8 (ci)
 - Zone 7 = R-13 + R-7.5 (ci)
- **Metal Building:**
 - Zones 6 & 7 = R-13 + R-13 (description below)

R-13 + R-13	Double insulation layer	Table 502.2(2) Excerpt
		The first layer of R-13 insulation batts is installed continuously perpendicular to the girts, and is compressed as the metal skin is attached to the girts. The second layer of R-13 insulation batts is installed within the framing cavity.

Ch. 5 - Commercial (Any Hght) & High Rise Res. (>3 stories) Bldgs [IECC 501 & Comm 63.0501]

- **ASHRAE 90.1-2004 may be used in lieu of the 2006 IECC reqmt's for satisfying the following topics on an individual basis:**
 - **IECC 502 Building Envelope**
 - **IECC 503 Building Mechanical Systems**
 - **IECC 504 Service Water Heating**
 - **IECC 505 Lighting**
- **Remember you CANNOT mix & match [i.e. lighting controls from ASHRAE, lighting allowances from IECC] within topics.**



IECC 501 & Comm 63.0501 (cont)

- SOME provisos are mandatory regardless of which (IECC or ASHRAE 90.1 Standard) option is used to determine compliance. Examples Incl:
 - 502.4 [Air leakage]
 - 502.5 [Moisture Control]
 - 503.2 & Comm 63.0503 (1) [Htg. & Cool'g. Design Loads]
 - Comm 63.0503 (7) or (8) [Economizers]
 - 505 & Comm 63.0505 [Elect. Power & Lighting systems]

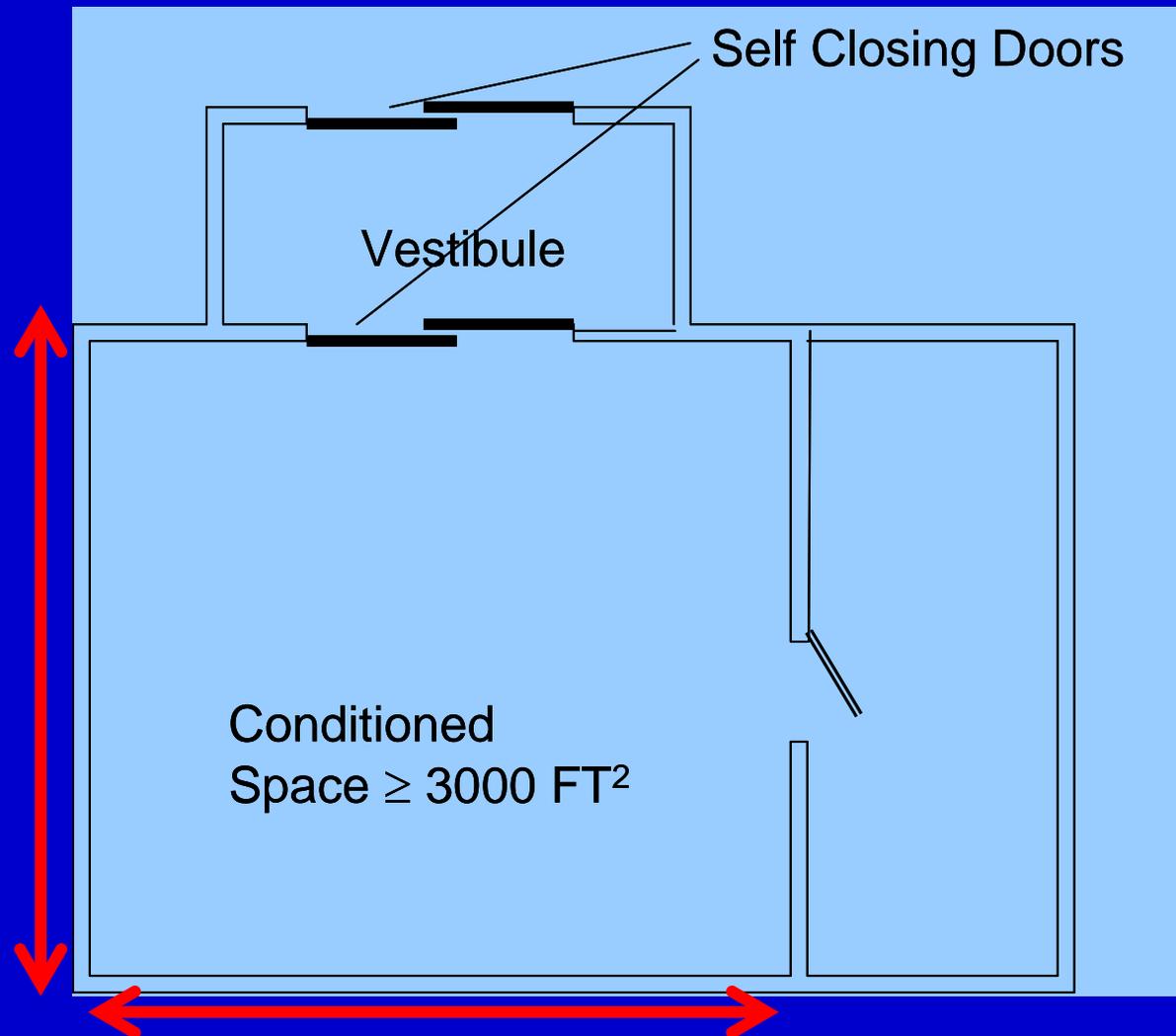
Vestibules [IECC 502.4.6]

Vestibules Req'd at Entrance Doors to reduce infiltration. Doors MUST have self-closing devices

- **Exceptions**

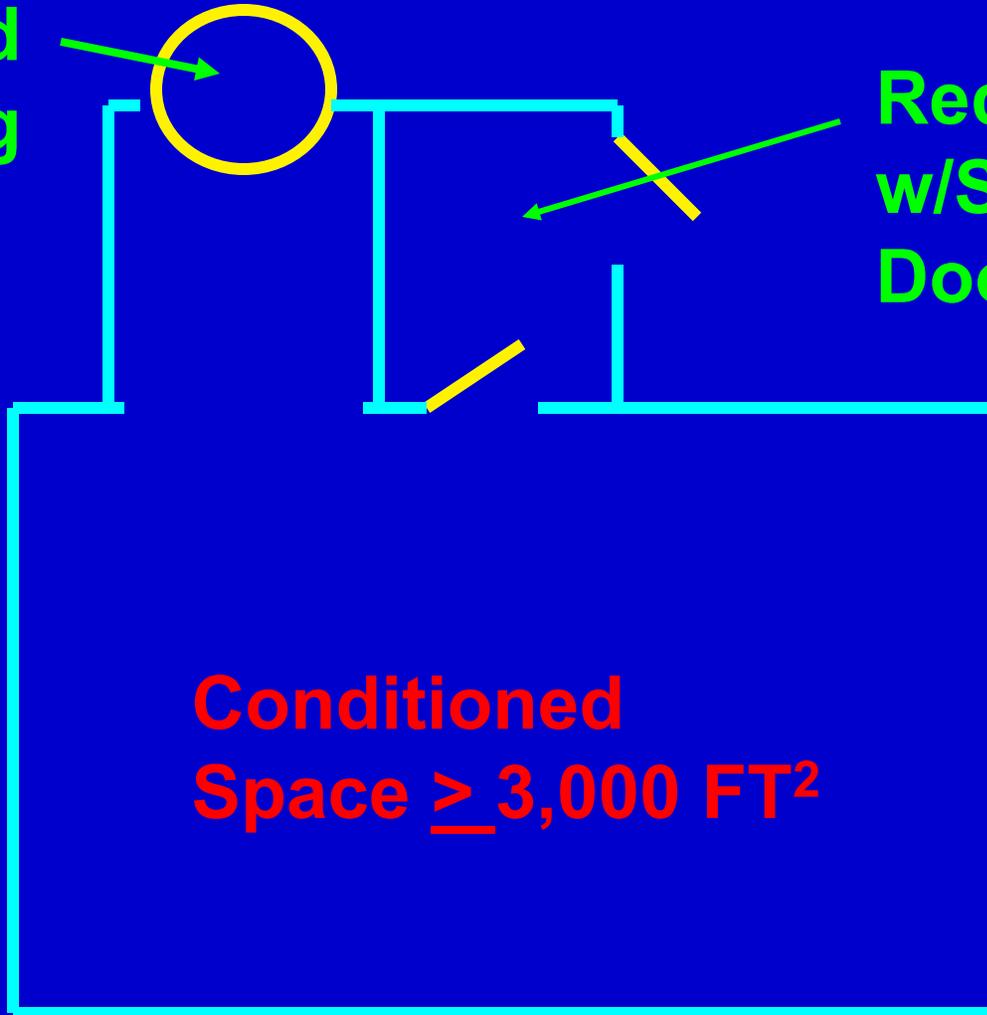
- Doors leading into spaces $< 3,000 \text{ ft}^2$
- Revolving Doors
- Sleeping room or dwelling unit doors
- Doors primarily for veh. movement, mat'l handling & the adjacent manddoors

Vestibules - IECC 502.4.6



Vestibules (Cont)

Exempted
Revolving
Door



Req'd Vestibule
w/Self-Closing
Doors

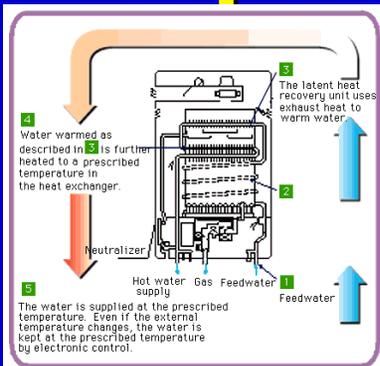
Conditioned
Space \geq 3,000 FT²

Mechanical Equipment Efficiencies

- Remember the Equipment efficiencies for A.C. units, heat pumps, furnaces, boilers, condensing units, centrifugal chillers, heat rejection equip. & water heaters must be met. [IECC Tables 503.2.3 (1) through (11), Table 504.2 & Comm 63.0503(2)]
- NOTE: Some have changed. Any “new” equipment placed in a commercial bld’g must meet new minimums

WCBC/Energy [IECC] Changes (cont.) s. 503.2.6

- In Commercial bldg's, energy recovery ventilation system generally req'd for individual syst's with a design supply air capacity exceed'g 5,000 CFM.



Key

Air flow

WCBC/Energy [IECC] Changes (cont.) s. 503.3.1

- In Commercial bldg's, we modify the economizer triggers to be 33,000 Btu/h (simple cooling systems) and 54,000 Btu/h (complex cooling systems) [Comm 63.0503(8)].

Outdoor temperature sensor

Outside air

Outside-air damper

Motorized actuator

Return air

Mixed air

Heating coil

Cooling coil

Supply air

damper

grate

Motorized actuator

Lighting Code Application

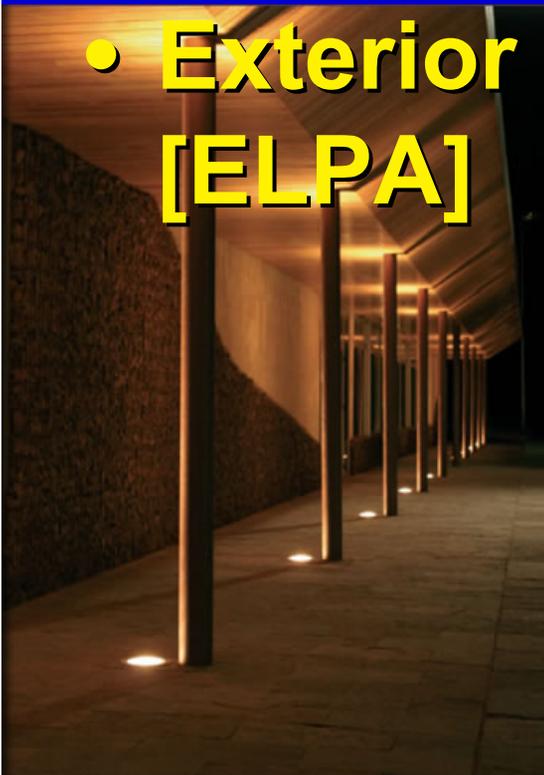
IECC 505

- 1) Determine Power Allowance in watts for interior and exterior use (add 5% of the exterior allowance per IECC 505.6.2)
- 2) Determine Actual Lighting Installation (inclusive of ballasts) in watts for the interior and exterior of the building
- 3) Compare--Actual installation wattage to be \leq Power allowance as applicable to interior and exterior use
- 4) Determine Required Controls

Lighting Power Allowance

- Interior Lighting Power Allowance [ILPA]

- Exterior Lighting Power Allowance [ELPA]



ILPA Connected Power [505.5.1]

Exceptions

- Specialized medical, dental & research lighting
- Professional sports arena playing field lighting
- Display lighting for exhibits in galleries, museums & monuments
- Sleeping unit lighting in hotels, motels, boarding house or similar buildings
- Emergency lighting automatically off during normal building operation



ILPA Added Exceptions

IECC 505.5.1 / Comm 63.0505(3)

- Additional “Wisconsinism” exceptions:
 - Theatrical lighting
 - Photographic process
 - Lighting integral to equipment installed by manufacturer
 - Task lighting for plant growth
 - Advertising/directional signage
 - Lighting equipment for sale
 - Lighting demonstration equipment for school
 - Lighting for safety/emergency (including “EXIT” lights)



Interior Lighting “Summation” Rules

- **Be aware of the differing provisions that exist for specific types of lighting systems**
- **Low Voltage lighting, track lighting, cable lighting, conductor lighting trail conductor lighting, etc.**
- **IECC 505.5.1.2 & Comm 63.0505(4)
[Replaces IECC 505.5.1.4]**

Interior Lighting Power Allowance (ILPA)

IECC Table 505.5.2

- **Table defines lighting power densities in Watts/Square Foot**
 - **Footnote a: Where both a general building area type & a more specific bldg area is listed, the more specific shall apply.**
 - **Footnote b: Additional wattage will be allowed for in retail areas in the amounts listed, and for the specific products listed.**

IECC Interior Power Reqmts.

**Table 505.5.2 - Interior Lighting Power Allowances (ILPA)
Lighting Power Densities**

Building Area Type ^a	(W/ft ²)
Automotive Facility	0.9
Convention Center	1.2
Court House	1.2
Dining: Bar Lounge/Leisure	1.3
Dining: Cafeteria/Fast Food	1.4
Dining: Family	1.6
Dormitory	1.0
Exercise Center	1.0
Gymnasium	1.1
Healthcare-Clinic	1.0
Hospital	1.2
Hotel	1.0
Library	1.3
Manufacturing Facility	1.3
Motel	1.0
Motion Picture Theater	1.2

Multi-Family	0.7
Museum	1.1
Office	1.0
Parking Garage	0.3
Penitentiary	1.0
Performing Arts Theater	1.6
Police/Fire Station	1.0
Post Office	1.1
Religious Building	1.3
Retail ^b	1.5
School/University	1.2
Sports Arena	1.1
Town Hall	1.1
Transportation	1.0
Warehouse	0.8
Workshop	1.4

ASHRAE Interior Power Reqmt's.

- **ASHRAE has 2 methods for interior lighting power calculation**
 - **Area method (similar to IECC s. 505)**
 - **Note that COMcheck v.3.4.2 software (using ASHRAE 90.1 2004 standard) currently only allows you to enter a single category**
 - **State recognizes use of multiple COMcheck runs for multiple areas**
 - **No additional lighting allowances**
 - **Space-by-Space method**
 - **“Area Factor” allowance for small rooms eliminated**

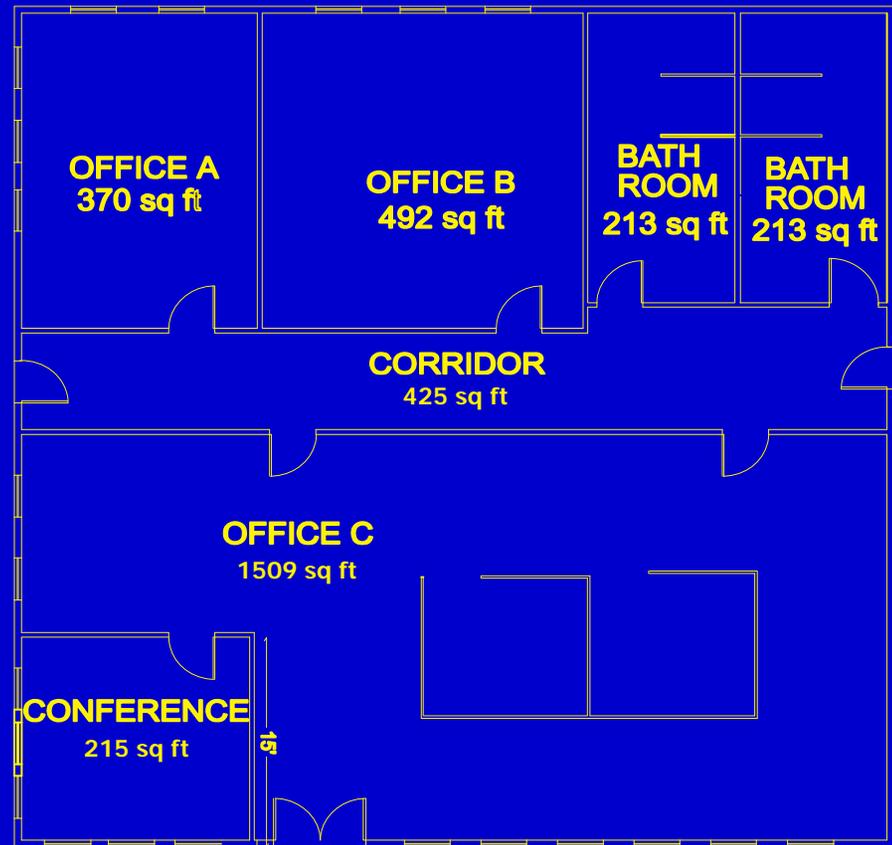
ASHRAE Interior Power Reqmt's

- Example – Small Office Building
- “Space-by-Space”

Areas (ft²):

Office A:	370
Office B:	492
Office C:	1,509
Conference:	215
Corridor:	425
Bathroom A:	213
Bathroom B:	213

Calculate ILPA on next Page



ASHRAE Interior Power Req.

- Space-by-Space Example (con't)

SPACE-BY-SPACE INTERIOR LIGHTING POWER ALLOWANCE (ILPA)

Room Number (Location)	Description (Table ASHRAE 9.6.1)	LPD	Floor Area (ft ²)	# of Identical Spaces	LPB (W)
Office A	Office - Enclosed	1.1	370	1	407
Office B	Office - Enclosed	1.1	492	1	541
Office C	Office – Open Plan	1.1	1,509	1	1,660
Conference	Conference/Meeting/Multipurpose	1.3	215	1	280
Corridor	Corridor	0.5	425	1	212
Bathrooms	Restrooms	0.9	213	2	383
Total ILPA:					3,482

Previous edition of code

ILPA was 6,932 W (50% less now)

3,482

ASHRAE Interior Power Req.

Table 9.6.1

TABLE 9.6.1 Lighting Power Densities Using the Space-by-Space Method

Common Space Types ^a	LPD (W/ft ²)	Building Specific Space Types	LPD (W/ft ²)
Office-Enclosed	1.1	Gymnasium/Exercise Center	
Office-Open Plan	1.1	Playing Area	1.4
Conference/Meeting/Multipurpose	1.3	Exercise Area	0.9
Classroom/Lecture/Training	1.4	Courthouse/Police Station/Penitentiary	
For Penitentiary	1.3	Courtroom	1.9
Lobby	1.3	Confinement Cells	0.9
For Hotel	1.1	Judges Chambers	1.3
For Performing Arts Theater	3.3	Fire Stations	
For Motion Picture Theater	1.1	Fire Station Engine Room	0.8
Audience/Seating Area	0.9	Sleeping Quarters	0.3
For Gymnasium	0.4	Post Office—Sorting Area	1.2
For Exercise Center	0.3	Convention Center—Exhibit Space	1.3
For Convention Center	0.7	Library	
For Penitentiary	0.7	Card File and Cataloging	1.1
For Religious Buildings	1.7	Stacks	1.7
For Sports Arena	0.4	Reading Area	1.2
For Performing Arts Theater	2.6	Hospital	
For Motion Picture Theater	1.2	Emergency	2.7
For Transportation	0.5	Recovery	0.8
Atrium—First Three Floors	0.6	Nurse Station	1.0
Atrium—Each Additional Floor	0.2	Exam/Treatment	1.5
Lounge/Recreation	1.2	Pharmacy	1.2

COMcheck Example "IECC"

IECC2006Retail.cck - COMcheck 3.4.2 Code: 2006 IECC

File Edit View Options Code Help

Lighting Schedule Input:

Project Envelope **Lighting** Mechanical

Linear Fluorescent Compact Fluorescent HID Incandescent

	Component	Fixture ID	Fixture Description	Lamp Description/ Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage	Exemption Allowance
Building									
1	Retail (1872 sq.ft.) Allowed wattage = 3288 Proposed wattage = 3090								
2	Linear Fluorescent 1	F1	Perimeter Cove	48" T8 32W (Super ...	Electronic	1	31	25	None
3	HID 1	F2	Prismatic Pendants (T6)	Metal Halide 70W	Electronic	1	4	82	None
4	HID 2	F3	4 ft track with 120W CPL	Other	Electronic	1	2	120	None
5	HID 2 copy 1	F4	8 ft track with 120W CPL	Other	Electronic	1	12	120	Allowance:Mercha...
6	Linear Fluorescent 2	F5	2x4 recessed prismatic	48" T8 32W (Super ...	Electronic	3	3	71	None
7	Linear Fluorescent 3	F6	Industrial	48" T8 32W (Super ...	Electronic	2	2	47	None

IECC 2006:
 Allowed Wattage: **3,288 W**
 Proposed Wattage: **3,090 W**
 (ILPA > ILP? Yes)

Building Use

"Project" Tab Info:

Add Area Type

	Building Area Type	Area	W/ft2
1	Retail	1872	1.5

Allowed Wattage Proposed Wattage

Lighting PASSES: Design 6% better than Code

Envelope Lighting

Add/move fixtures to an appropriate building use category.

COMcheck (cont)

ASHRAE Area methodology

ASHRAERetailArea.cck - COMcheck 3.4.2 Code: 90.1 (2004) Standard

File Edit View Options Code Help

No Allowances or Exemptions Allowed!

Project Envelope **Lighting** Mechanical

Linear Fluorescent Compact Fluorescent HID Incandescent

	Component	Fixture ID	Fixture Description	Lamp Description/ Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage	Exemption Allowance
Building									
1	Retail (1872 sq.ft.)	Allowed wattage = 2808 Proposed wattage = 3090							
2	Linear Fluorescent 1	F1	Perimeter Cove	48" T8 32W (Super ...	Electronic	1	31	25	None
3	HID 1	F2	Prismatic Pendants (T6)	Metal Halide 70W	Electronic	1	4	82	None
4	HID 2	F3	4 ft track with 120W CPL	Other	Electronic	1	2	120	None
5	HID 2 copy 1	F4	8 ft track with 120W CPL	Other	Electronic	1	12	120	None
6	Linear Fluorescent 2	F5	2x4 recessed prismatic	48" T8 32W (Super ...	Electronic	3	3	71	None
7	Linear Fluorescent 3	F6	Industrial	48" T8 32W (Super ...	Electronic	2	2	47	None

ASHRAE 2004 Area:
 Allowed Wattage: **2,808 W**
 Proposed Wattage: **3,090 W**
 (ILPA vs. ILP? No)

"Project" Tab Info:

Building Use Whole Building Area Category (Space-By-Space)

Whole Building Type	Area	W/ft2
Retail	1872	1.5

Allowed Wattage: 2808 Proposed Wattage: 3090

Lighting FAILS: Design 10% worse than Code

Envelope TBD Lighting -10%

Add/move fixtures to an appropriate building use category.

COMcheck (cont.) ASHRAE Space-by-Space methodology

ASHRAERetailSxS.cck - COMcheck 3.4.2 Code: 90.1 (2004) Standard

File Edit View Options Code Help

Allowances & Exemptions Applied

Project Envelope Lighting Mechanical

Linear Fluorescent Compact Fluorescent HID Incandescent

	Component	Fixture ID	Fixture Description	Lamp Description/ Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage	Exemption Allowance
Building									
1	Retail:Sales Area (1585 sq.ft) Allowed wattage = 3174 Proposed wattage = 2543								
2	Linear Fluorescent 1	F1	Perimeter Cove	48" T8 32W (Super ...	Electronic	1	31	25	None
3	HID 1	F2	Prismatic Pendants (T6)	Metal Halide 70W	Electronic	1	4	82	None
4	HID 2	F3	4 ft track	Other	Electronic	1	2	120	None
5	HID 2 copy 1	F4	8 ft track with 120W CPL	Other	Electronic	1	2	120	Exemption:Retail ...
6	HID 2 copy 2	F4	8 ft track with 120W CPL	Other	Electronic	1	10	120	Allowance:Retail ...
7	Common Space Types:Restrooms Allowed wattage = 43 Proposed wattage = 71								
8	Linear Fluorescent 2	F5		48" T8 32W (Super ...	Electronic	3	1	71	None
9	Common Space Types:Office Allowed wattage = 102 Proposed wattage = 142								
10	Linear Fluorescent 3	F5		48" T8 32W (Super ...	Electronic	3	2	71	None
11	Common Space Types:Active Allowed wattage = 95 Proposed wattage = 94								
12	Linear Fluorescent 4	F6		48" T8 32W (Super ...	Electronic	2	2	47	None

ASHRAE 2004 Space-by-Space:
 Allowed Wattage: 3,415 W
 Proposed Wattage: 2,850 W
 (ILPA vs. ILP? Yes)

Lighting PASSES: Design 17% better than Code

Add/move fixtures to an appropriate building use category.

Building Use

Whole Building Area Category (Space-By-Space)

Add Area Category "Project" Tab Info:

	Area Category	Area	W/ft2
1	Retail:Sales Area	1585	1.7
2	Common Space Types:Restrooms	48	0.9
3	Common Space Types:Office - Enclo...	93	1.1

2850

+17%

Exterior Light'g Power Allowance [IECC 505.6.2 & Table 505.6.2]

- Remember the additional unrestricted allowance of 5% of the sum total
- Remember the exceptions for some lighting such as:
- Specialized signal/directional/marker lights for transportation, Athletic playing areas or lighting for public monuments & landmarks [IECC 505.6.2 & Table 505.6.2]



Lighting System Controls (Section 505)

- Includes Interior Lighting & Exterior Lighting
- General Exception for areas designated as security or emergency areas that must be continuously lighted & lighting in stairways or corridors that are elements of the means of egress.
- Control types include Manual shut-off, Automatic shut-off controls, Light reduction Controls, Daylighting Controls, etc. [s. 505.2]



Interior Lighting Controls

Daylit Areas [Comm 63.0505 (1) & (2)]

- Daylighting Controls required to reduce lighting by at least 50% in reasonable uniform pattern for windows & skylights:
 - Exceptions
 - Enclosed space is < 250 sf
 - Lighting density is ≤ 0.8 watts
 - Only 1 luminaire in daylight area
 - Etc.

Daylit Areas

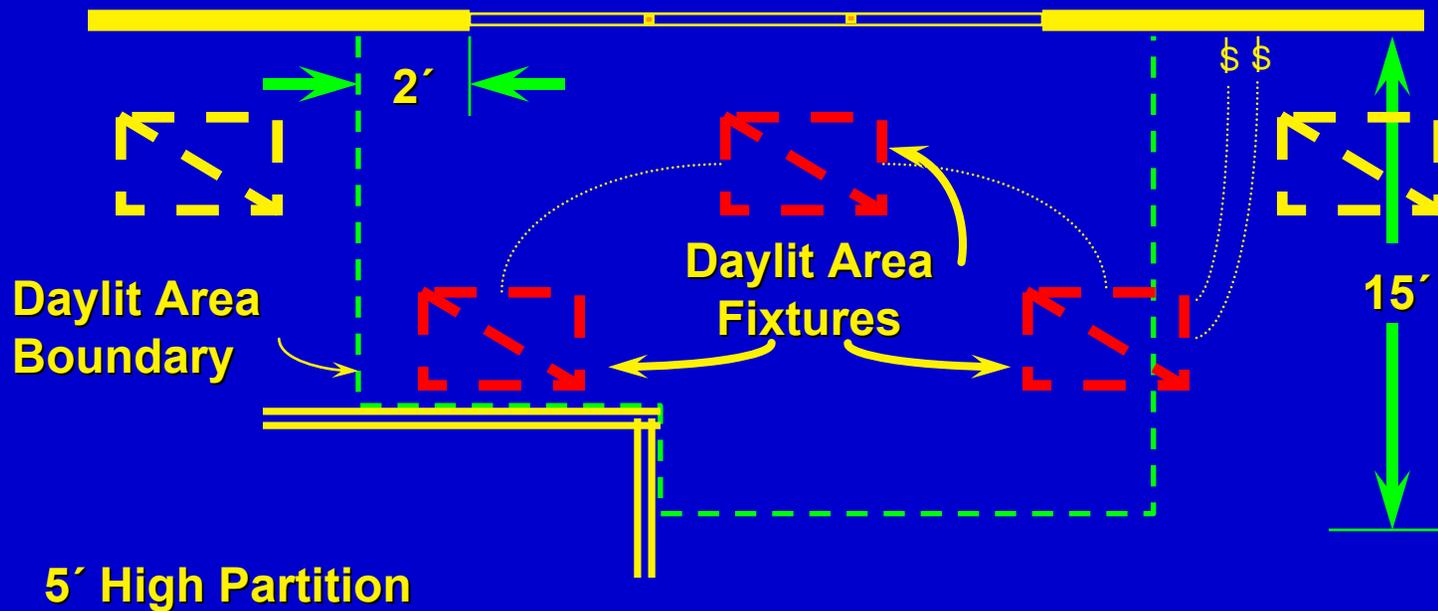
Comm 63.0505 (1)

- Daylit area behind windows:
 - 15 ft behind vertical glazing, 2 ft on either side, or up to partitions ≥ 60 " tall
- Daylit area under skylights:
 - Area of skylight plus the lesser of **70%** of the floor-to-ceiling height, the distance to the nearest 60" or high permanent partition, or $\frac{1}{2}$ the horizontal distance to the edge of the closest skylight or vertical glazing

Daylit Area Controls-Windows

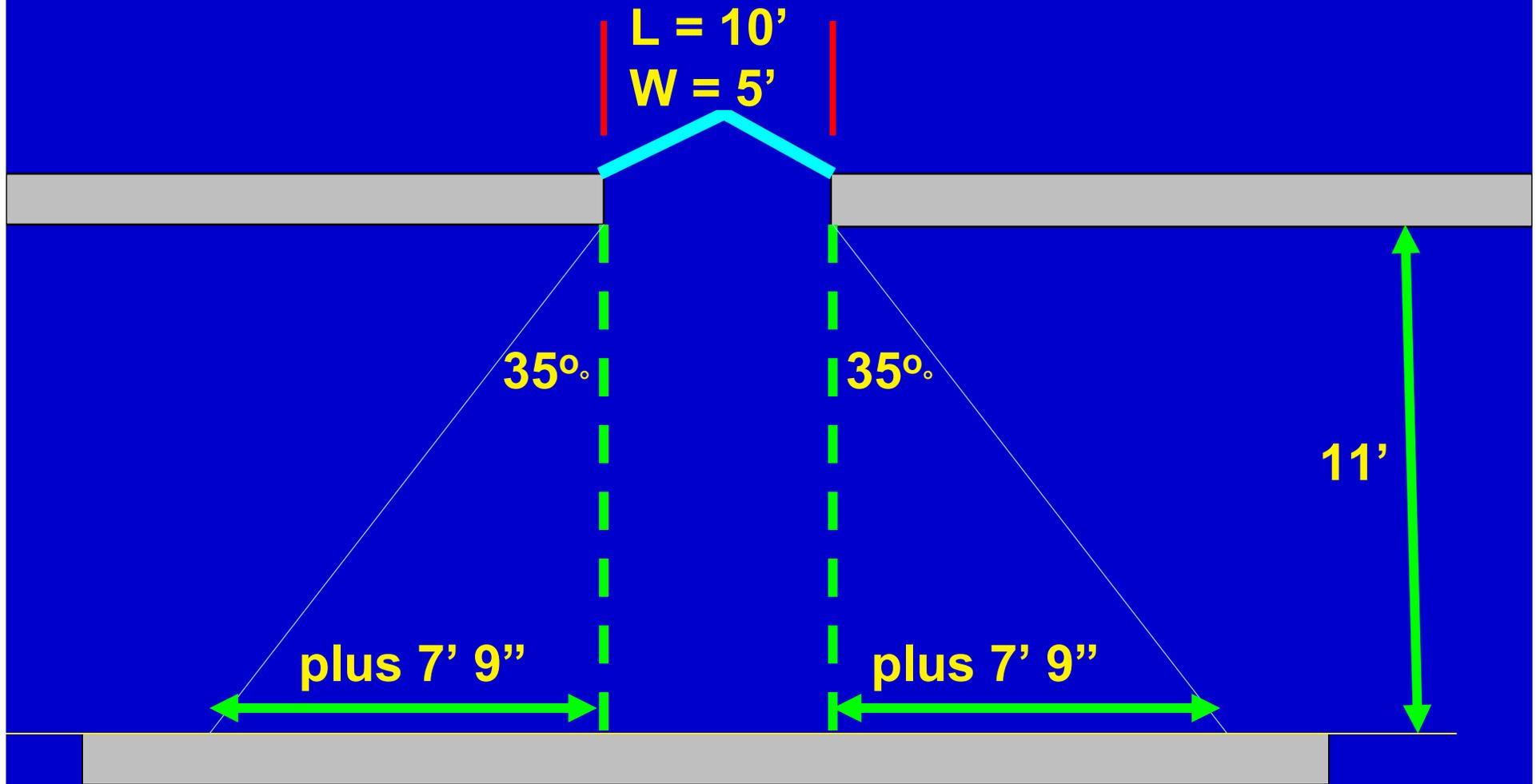
Comm 63.0505

Vertical Glazing (windows):



Lighting Controls

Daylit Area Controls-Skylights



Daylit Area - Comm 63.0505

Exit Signs - IECC 505.4

This Sign
Uses only $\frac{1}{4}$
Watt!!



- Internally illuminated exit signs shall not exceed 5 watts per face.
 - The code is requiring use of LED assemblies (Energy Star Listed Units)
 - The requirement effectively eliminates fluorescent & incandescent type units.

Questions ???

