

2009 UDC Updates PowerPoint Presentations



◆ Part 1

PROGRAM AND CODE UPDATE



2009 UDC January/February/March Updates

Presentation on

2009 Uniform Dwelling Code



Program and Code Update

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You Should Have:

- Handout -- 2009 Uniform Dwelling Code Update
- Handout – Notice of Changes to the UDC
- Handout – 2009 Wisconsin Unofficial Uniform Dwelling Code (UDC)
- Handout – UDC-Related Certification Details and a Letter on New Regulations for Elevators and Dumbwaiters Serving Dwelling Units.
- Brochure – Solid Fuel-Fired Water-Heating Appliances

Administrative Update & New Code

- UDC Enforcement - State Contract
- Elevator/Conveyance Code Change
- Other Code Changes/Legislative Update
- **Next Code Change Cycle – April 1, 2009**
- UDC Contacts
- Websites

UDC Enforcement Status

- New contracts with UDC inspection agencies have been entered into effective January 1, 2009. Some agencies have returned and others have not. Contract is good for 2 years, until December 31, 2010, and the department has the option to renew it for another 2 years.

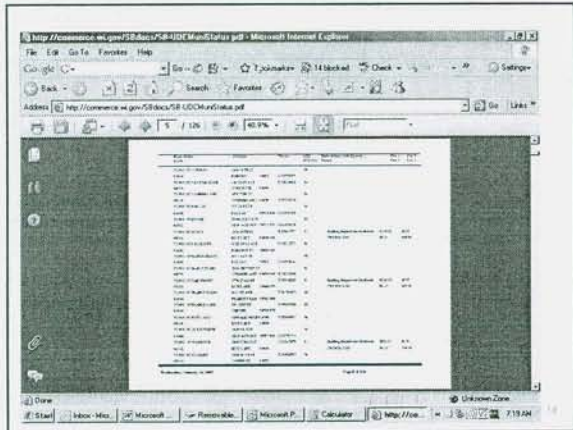
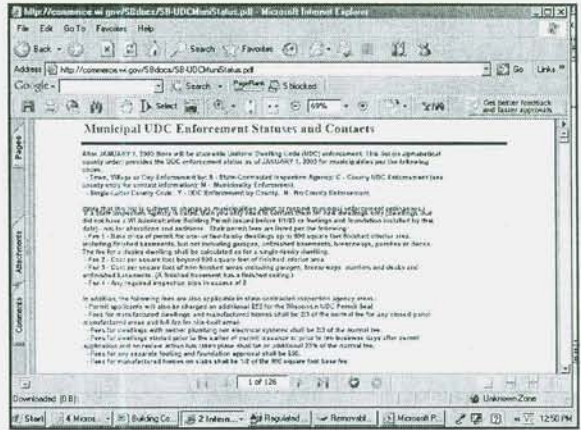
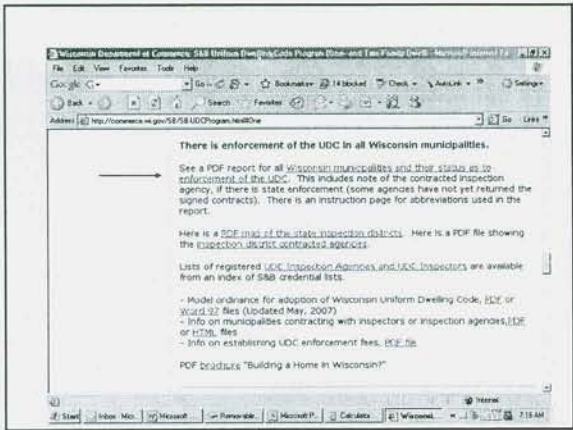


Municipal Enforcement Status

- As of January 20, 2009 municipalities with:
 - State enforcement – 388 (-65)
 - Municipal enforcement – 1315 (+66)
 - County enforcement – 147 (-1)
- There are 9 counties that provide countywide enforcement.
 - Adams
 - Chippewa
 - Eau Claire
 - Florence
 - Langlade
 - Marquette
 - Richland
 - Trempealeau
 - Waushara

How can I find out if a municipality has local enforcement, county level enforcement or state level enforcement?

You can go to the Safety and Buildings UDC program page and click on "There is enforcement of the UDC in all Wisconsin municipalities" on the right-hand side of the page.

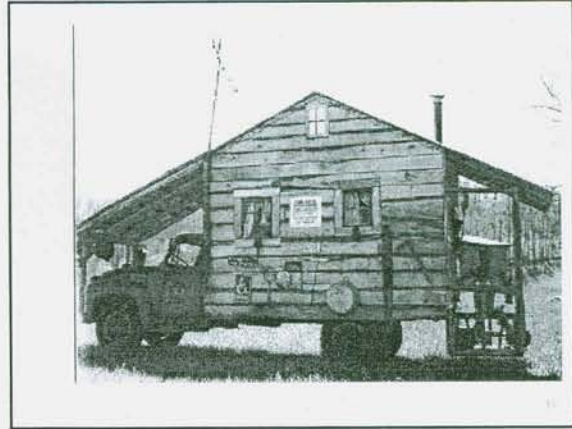


Municipal Responsibility

- If the municipality initially has the state provide the enforcement, it may decide at a later date to provide its own enforcement.
- To do that it must **adopt an ordinance** specifying that it is providing enforcement and must employ or contract with an inspector(s) or inspection agency either of which has the appropriate UDC credentialed inspector(s).
- In accordance with Comm 20.06 (1) (b) the municipality intending to exercise jurisdiction **shall notify the department**, in writing, at least 30 days prior to the date upon which it intends to exercise jurisdiction.
- A sample UDC ordinance for adoption may be found on the S & B UDC Program webpage.

Dwelling Contractor
&
Dwelling Contractor Qualifier
License

Rules Became Effective -- January 1, 2008




Dwelling Contractor Qualifier.

➤ A category called "Dwelling Contractor – Qualifier" was created to address the continuing education requirements.

- It will be on a 2-year cycle.
- The continuing education will be 12 hours every 2 years.
- This credential belongs to a person

Dwelling Contractor Qualifier.



➤ **Comm 5.315 Dwelling contractor qualifier.**
(1) GENERAL. The purpose of the dwelling contractor qualifier certification is to provide proof of fulfilling the continuing education obligations to the issuers of building permits as required under s. 101.654 (1) (a), Stats.

Dwelling Contractor Qualifier.

2. a. A statement which may be verified by the department that the person at any time from April 11 to April 14, 2006 was the applicant for, was a person eligible to apply for, or was the contact person for a dwelling contractor financial responsibility certification or dwelling contractor financial responsibility – restricted certification.

b. This subdivision does not apply after September 1, 2009.

c. The eligibility provisions under this subd. 2. a. may be used only once to obtain a dwelling contractor qualifier certification.

Dwelling Contractor Qualifier.

(3) RENEWAL. (a) 1. A person may renew his or her certification as a dwelling contractor qualifier.

2. A dwelling contractor qualifier certification shall be renewed in accordance with s. Comm 5.07.

(b) 1. The renewal of a certification as a dwelling contractor qualifier shall be contingent upon the individual obtaining at least 12 hours of acceptable continuing education within the time period specified in s. Comm 5.08 and Table 5.06, except as provided in subd. 2.

How does this affect municipal, county and state contracted UDC inspectors/permit issuers?



Comm 20.09 (5) (c) Pursuant to s. 101.65 (1m), Stats., a Wisconsin uniform building permit may not be issued to a person unless the person complies with all of the following, except as provided under s. 101.654 (1) (b) and (c) 2., Stats.:

Note: Section 101.654 (1) (b), Stats., exempts an owner of a dwelling who resides or will reside in the dwelling and who applies for a building permit to perform work on the dwelling from obtaining a dwelling contractor financial responsibility registration. Under s. 101.65 (1r), an owner who obtains a building permit needs to sign a statement advising the owner of the potential consequences of hiring a contractor to perform work under the permit who is not bonded or insured under s. 101.654 (2) (a), Stats.

(Part of Copy for Applicants)

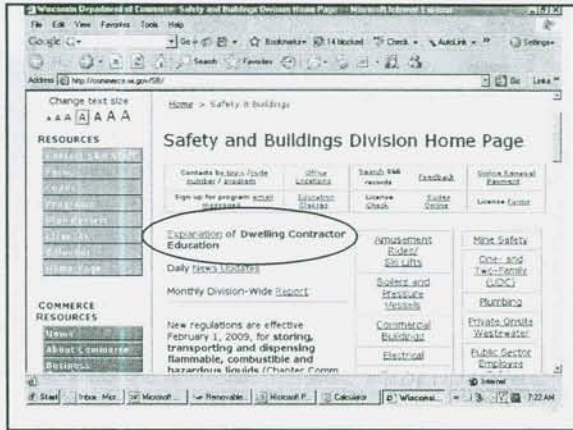
Cautionary Statement To Owners Obtaining Building Permits

101.65(1r) of the Wisconsin Statutes requires municipalities that enforce the Uniform Dwelling Code to provide an owner who applies for a building permit with a statement advising the owner that:

If the owner hires a contractor to perform work under the building permit and the contractor is not bonded or insured as required under s. 101.654 (2) (a), the following consequences might occur:

(a) The owner may be held liable for any bodily injury to or death of others or for any damage to the property of others that arises out of the work performed under the building permit or that is caused by any negligence of the contractor that occurs in connection with the work performed under the building permit.

(b) The owner may not be able to collect from the contractor damages for any loss sustained by the owner because of a violation by the contractor of the one- and two-family dwelling code or an ordinance enacted under sub. (1) (a), because of any bodily injury to or death of others or damage to the property of others that arises out of the work performed under the building permit or because of any bodily injury to or death of others or damage to the property of others that is caused by any negligence by the contractor that occurs in connection with the work performed under the building permit.



Wisconsin Department of Commerce - Safety and Buildings Division Home Page

Home > Safety & Buildings

REGISTRATION


- Education of Dwelling Contractor
- Registration
- License
- License
- License
- License

COMMERCE RESOURCES


- Home
- About Commerce
- Business

REGULATION OF CONVEYANCES

New regulations for elevators and dumbwaiters serving individual residential dwelling units, effective January 1, 2009.

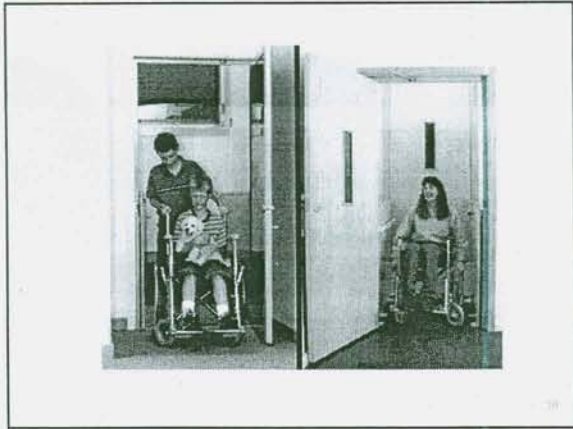


See letter of December 18, 2008.



Comm 21.115 Installation of elevators or dumbwaiters.

Elevators or dumbwaiters serving dwelling units shall comply with the requirements under ch. Comm 18.



- **Comm 5.37 Elevator contractors.**
- **Comm 5.38 Elevator installers.**
 - (1) A licensed elevator mechanic.
 - (2) A registered elevator apprentice.
 - (3) A registered elevator helper.
- **Comm 5.64 Elevator inspectors.**



2009 Code Changes

Effective April 1, 2009

UDC and Manufactured Home Contacts


Wisconsin
 Safety and Buildings Division
 UDC Consultant Offices



1. David Hahn, Civil Consultant (Hudson office) 908-224-7900; david.hahn@dot.state.wi.us
2. Ken Mize, Civil Consultant (Oshkosh office) 920-538-3600; ken.mize@dot.state.wi.us
3. Steve Trilling, Civil Consultant (Madison office) 715-481-3861; steve.trilling@dot.state.wi.us
4. Tracy Stahler, Civil Consultant (Eau Claire office) 715-833-4444; tracy.stahler@dot.state.wi.us
5. Dan Winkler, Civil Consultant (Green Bay office) 920-835-8800; dan.winkler@dot.state.wi.us

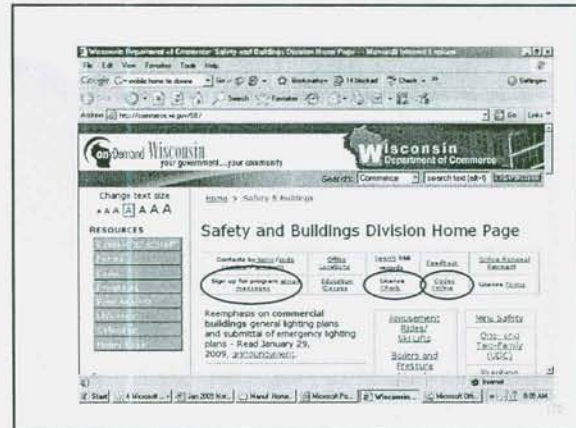
Manufactured Home Consultants
 Safety and Buildings Division
 Wisconsin Department of Commerce



1. Eastern District
 Jack W. Strick
 2311 Sun Lane Place
 Secaucus, NJ 07094
 908-362-7620
 jack.wstrick@dc.state.wi.us
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 Larry Nalasko
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 Fond du Lac, WI 53114
 920-219-9131
 larry.nalasko@dot.state.wi.us

Websites

- Department of Commerce
www.commerce.wisconsin.gov
- Safety and Buildings Home Page
www.commerce.wisconsin.gov/SB
- Commerce Codes
www.commerce.wisconsin.gov/SB/SB-DivCodes.html
- Wisconsin Administrative Codes
www.legis.state.wisconsin.gov/cod/toc.html



2009 UDC Updates PowerPoint Presentations



◆ Part 2

WALL BRACING



2009 UDC January/February/March Updates

Presentation on

2009 Uniform Dwelling Code



Wall Bracing

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You Should Have:

Handout -- Wall Bracing

2009 Code Change



Status of 2009 Code Change

- Effective April 1, 2009.
- Watch S&B website for updates.
- If you have any interest in any proposed code changes, you may attend the council meetings or contact your council representative. List of members may be found on the S&B Div codes webpage.

Comm 21.25 (8) WALL BRACING. (a) *General.*
Dwellings using wood-framed walls shall be braced in accordance with this section.

(b) *Bracing Materials and Methods.*

1. 1-inch-by-4-inch let-in bracing 60 to 45 degrees from the horizontal.
2. Metal T-bracing not less than 22 gage thick and 1 3/4 inch wide 60 to 45 degrees from the horizontal.
3. Wood boards of 5/8-inch net minimum thickness applied diagonally.
4. Wood structural panel sheathing with all edges fastened not less than 3/8 inch thick for 16-inch stud spacing and not less than 7/16 inch thick for 24-inch stud spacing.

Effective April 1, 2009

Comm 21.25 (8) WALL BRACING.

(b) *Bracing Materials and Methods.* (Cont'd)

5. Minimum one-half-inch thick structural fiberboard sheathing applied vertically or horizontally on studs spaced a maximum of 16 inches on center.
6. Gypsum board with minimum 1/2-inch thickness placed on studs spaced a maximum of 24 inches on center and fastened at panel edges including top and bottom plates at 7 inches on center
7. Alternative methods under par. (9).
8. Other approved wind bracing materials and methods.

Effective April 1, 2009

Comm 21.25 (8) WALL BRACING. (Cont'd)

(c) *Minimum length of braced panels.* 1. 'General.'
Except as provide under subd. 2., the minimum lengths shall be as follows:

- a. For methods 3, 4 and 5, each braced wall panel shall be at least 48 inches in length, covering a minimum of three stud spaces where studs are spaced 16 inches on center and covering a minimum of two stud spaces where studs are spaced 24 inches on center.
- b. For method 6, each braced wall panel shall be at least 96 inches in length where applied to one face of a braced wall panel and at least 48 inches in length where applied to both faces.

Effective April 1, 2009

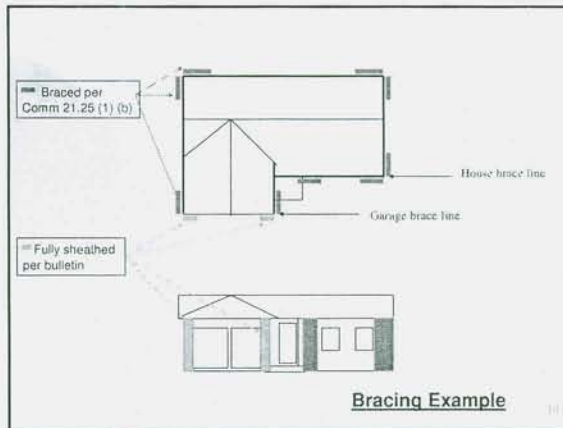
Comm 20.09 Procedure for obtaining uniform building permit.

(5) REQUIRED PLANS.

(b) *Floor plan.*

2. The following features shall be included on all floor plans:
 - d. The location and construction details of the braced wall lines.

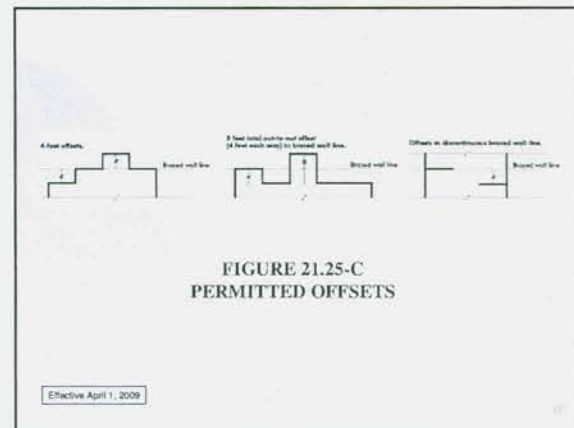
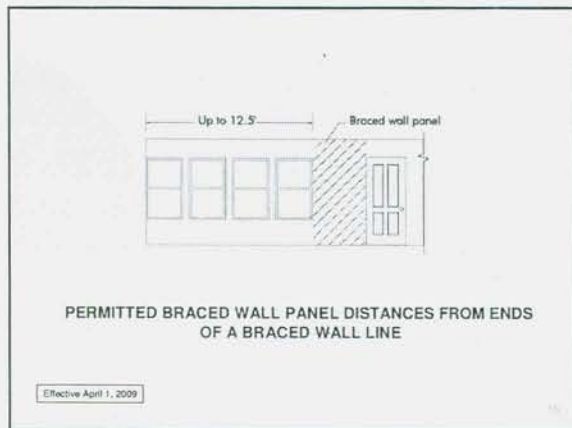
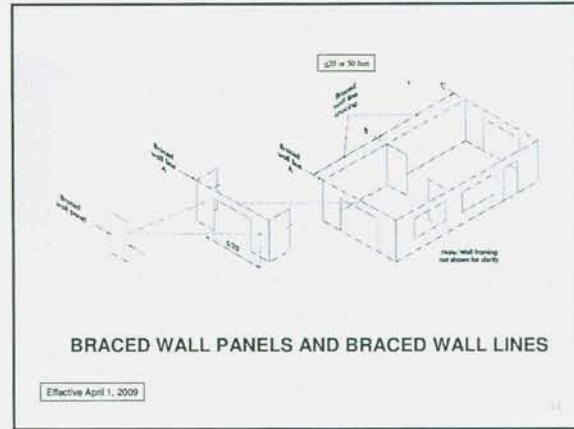
Effective April 1, 2009



Bracing Methods
Discontinuous (Isolated) Methods (Except M7 Continuous)

Method	Description	Min. Width
1	Let-in bracing, wood 1x4	55" to 96"
2	Let-in bracing, metal T	55" to 96"
3	Diagonal lumber boards	48"
4	Wood Structural Panels	48"
5	Fiberboard	48"
6	Gypsum (1-or 2-sided)	48" or 96"
7	Alternate braced panels w/ holddowns Continuously sheathed w/ WSP's	28" - 42" 16" - 24"
8	Other approved wind bracing methods	

Effective April 1, 2009

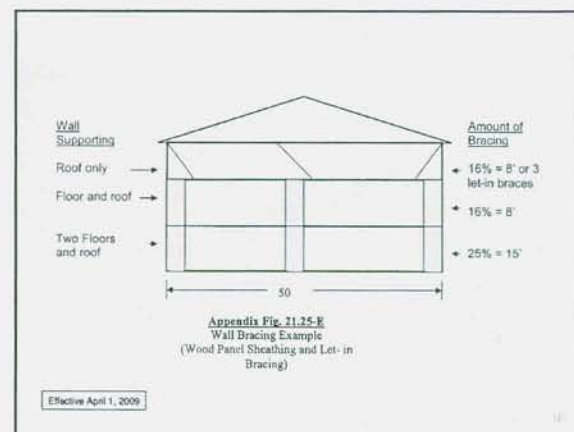


**TABLE 21.25-H
MINIMUM REQUIRED BRACING AMOUNTS FOR WALLS**

Wall Supporting:	AMOUNT OF BRACING PER WALL LINE ¹	
	Wood Structural Panel Sheathing [Sub. (8) (b) 4, (9) (b) & (9) (c)]	Other Methods Permitted [Sub. (8) (b) 1, 2, 3, 5 & 6.]
Roof only ²	16%	16% ³
Floor and roof	16%	25% ⁴
Two Floors and roof	25%	35% ⁵

¹ The "Roof only" condition also applies to one braced wall line of wood frame construction on the ground floor where all other exterior walls on the ground floor are constructed of masonry or concrete in accordance with a Code. 21.18.
² Wood and metal let in bracing exempt from % bracing requirement, but not spacing requirement.
³ Wood and metal let in bracing not permitted as a bracing method.
⁴ Maximum wall heights equal 12 feet. For wall heights over 10 feet, increase percent bracing requirement an additional 20%.
⁵ For continuous sheathing method with wood structural panels, percent requirement may be decreased 10% when openings on the wall line do not exceed 85% of wall height and may be decreased 20% when openings do not exceed 67% of wall height. See Table 21.23-1.

Effective April 1, 2009



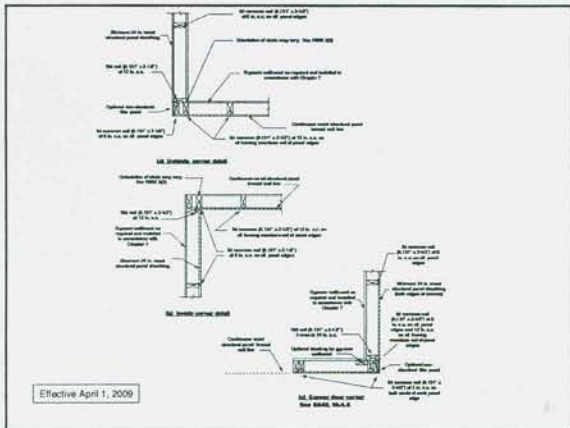
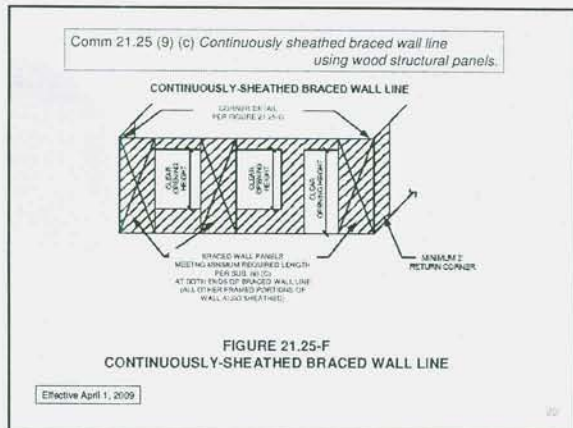
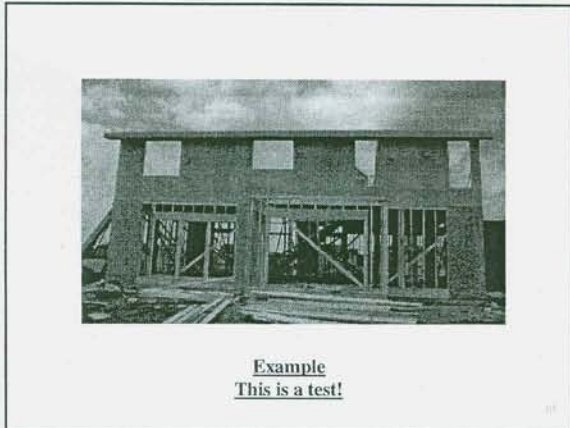
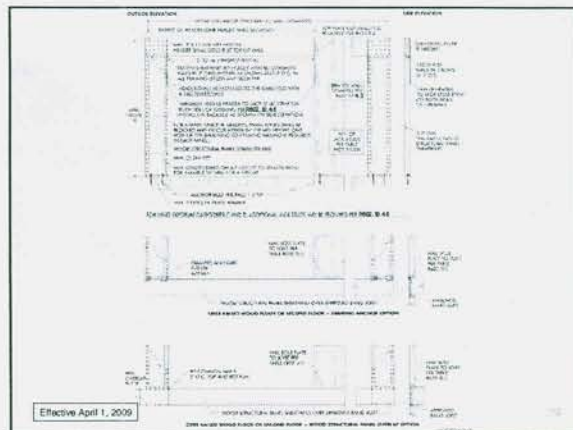
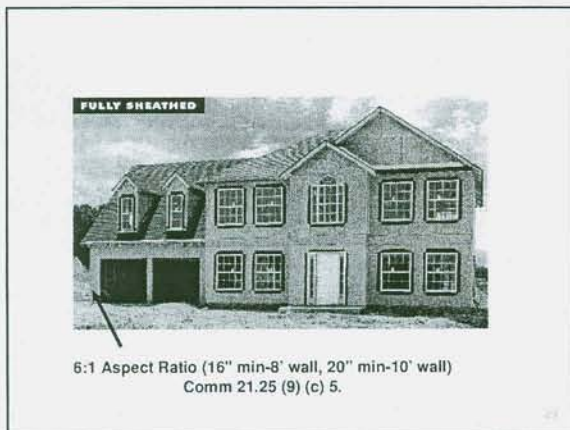


TABLE 21.25-K
ADJUSTMENT FACTORS TO THE PERCENTAGE OF REQUIRED BRACING PER WALL LINE – CONTINUOUSLY SHEATHED

ADJUSTMENT BASED ON MAXIMUM WALL CLEAR OPENING HEIGHT:	MULTIPLY PERCENTAGE OF BRACING PER WALL LINE BY:
Continuous wood structural panel sheathing when maximum opening height in wall line does not exceed *	0.9
	0.8

* Percentage of bracing for continuous wood structural panel sheathing shall be based on sub. (8) (b) 4 requirements.

Effective April 1, 2009



Comm 21.25 (8) WALL BRACING. (a) *General.*
 Where a building, or a portion thereof, does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with accepted engineering practice.

Note: Acceptable engineering wall bracing practices include the provisions under s. R602.10 of the International Residential Code-2009.

Effective April 1, 2009

The International Residential Code (IRC) ?



TABLE R602.10.1(1)
 MINIMUM WALL BRACING REQUIREMENTS BASED ON WIND SPEED
 FOR A TYPICAL OF BRACED WALL LINE SPACING

WIND SPEED CATEGORY SPEED RANGE (MPH) SPEED RANGE (KPH)	WIND DIRECTION WIND LINE SPACING (FT)	MINIMUM TOTAL LENGTH (FEET) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE					
		WIND FROM SIDE	WIND FROM END	WIND FROM CORNER	WIND FROM ANY DIRECTION		
I	15	10	1.0	1.0	1.0		
		15	1.5	1.5	1.5		
		20	2.0	2.0	2.0		
	20	15	10	2.0	2.0	2.0	
			15	3.0	3.0	3.0	
			20	4.0	4.0	4.0	
		20	10	10	3.0	3.0	3.0
				15	4.0	4.0	4.0
				20	5.0	5.0	5.0
	II	15	10	1.5	1.5	1.5	
			15	2.0	2.0	2.0	
			20	2.5	2.5	2.5	
20		15	10	2.5	2.5	2.5	
			15	3.5	3.5	3.5	
			20	4.5	4.5	4.5	
		20	10	10	3.5	3.5	3.5
				15	4.5	4.5	4.5
				20	5.5	5.5	5.5

Effective April 1, 2009

This information prepared by the ICC Ad Hoc Wall Bracing Committee of the 2009 IRC wall bracing provisions can be found by accessing the ICC website

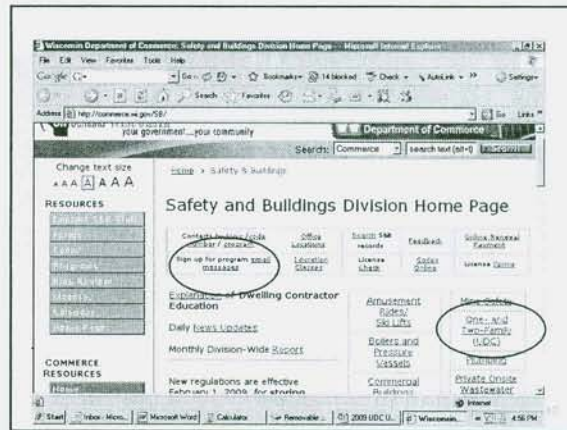
www.iccsafe.org

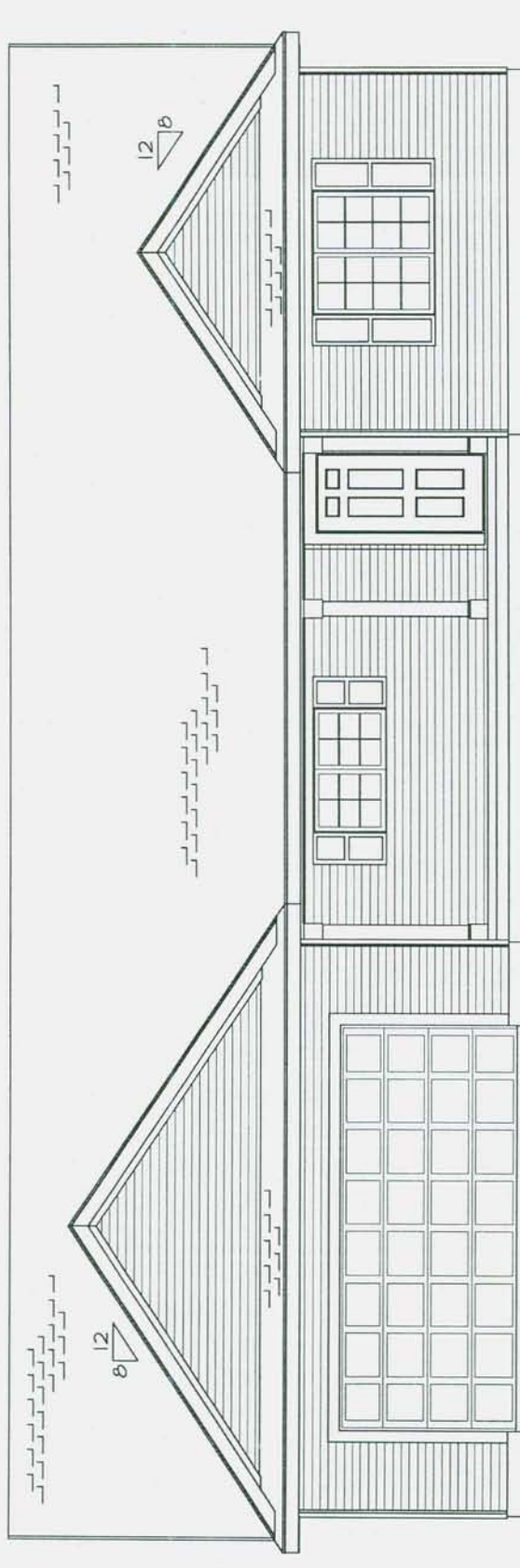
[ICC Ad Hoc Committee on Wall Bracing (AHC-WB)]

The final version of the IRC wall bracing provisions will be reprinted, with the approval of ICC, in the UDC appendix. This reprint may not be available prior to the effective of the UDC, April 1, 2009.

Websites

- Safety and Buildings Home Page
www.commerce.wi.gov/sb
- Commerce Codes
www.commerce.wi.gov/CSRS/CSRC-DivCodes.html
- Wisconsin Administrative Codes
www.legis.wisconsin.gov/sb/code/codetoc.htm





Building #1
One-Story

Front Elevation



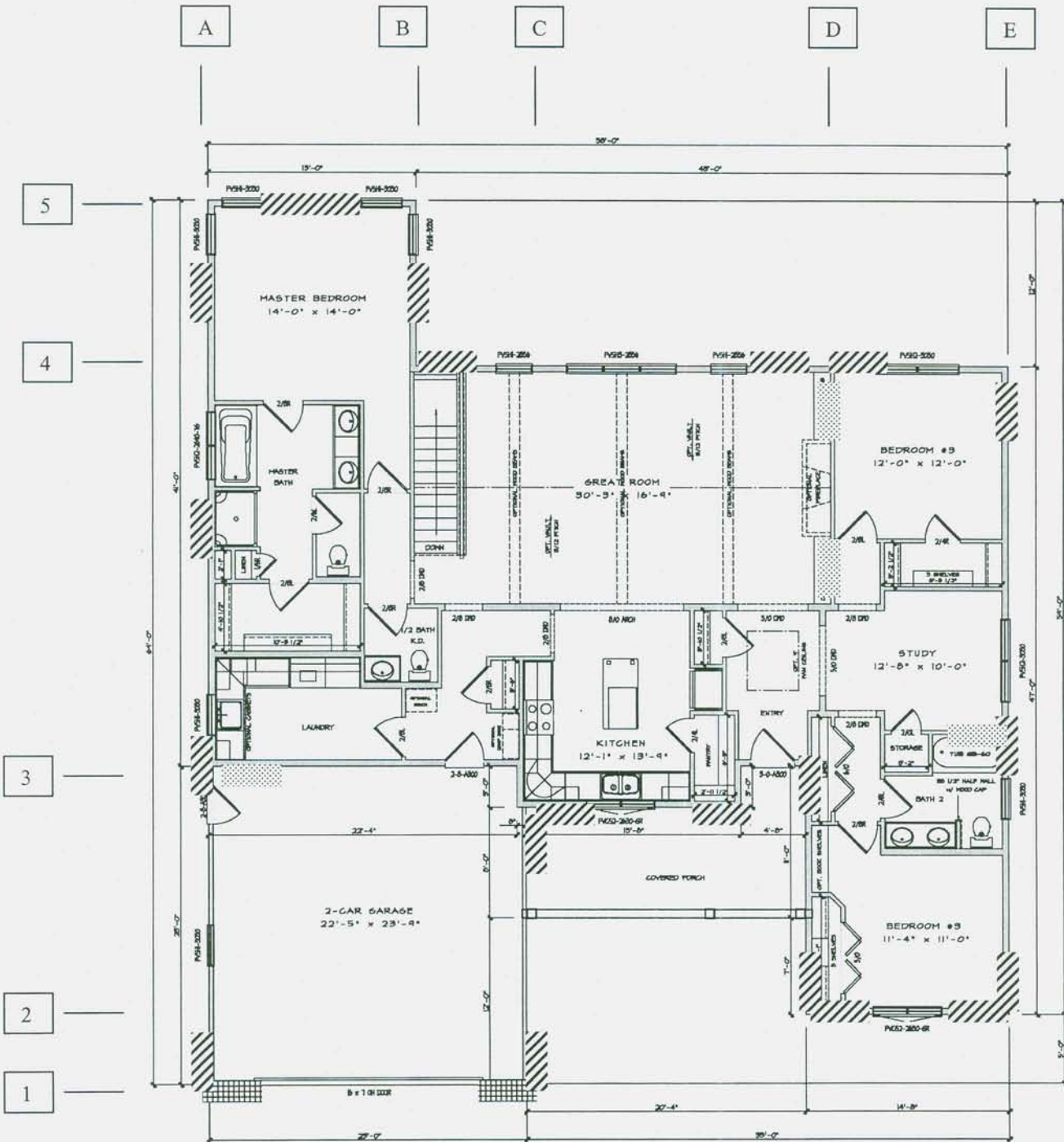
Continuously- sheathed per s. Comm 21.25(9)(c)5., Fig. 21.25-K, W/2 foot return.



Four Feet of Wood Structural Panel Sheathing or Diagonal Bracing



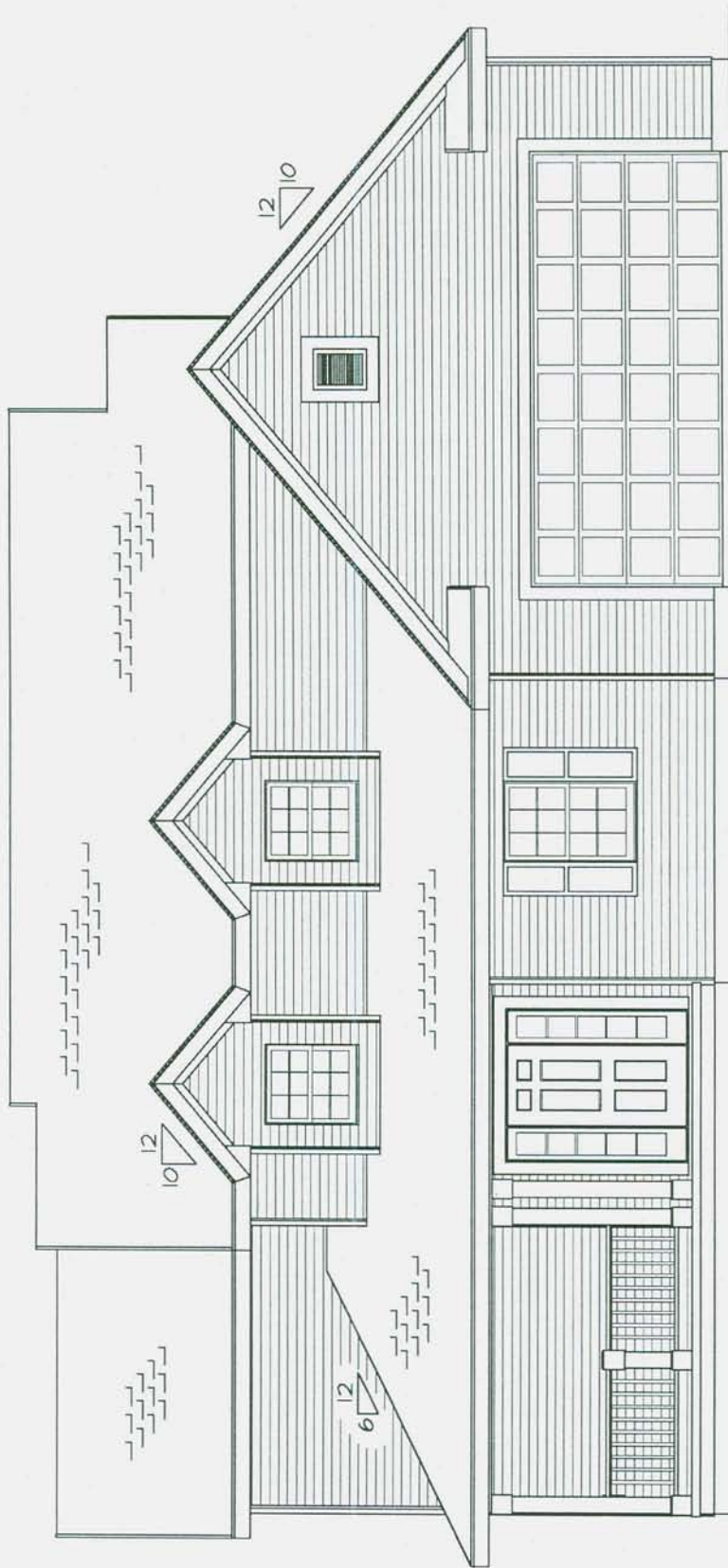
Four Feet of Gypsum Wallboard Applied to Both Sides of Wall or Diagonal Bracing.



Building #1

One-Story

First Floor



Building #2
Two-Story

Front Elevation

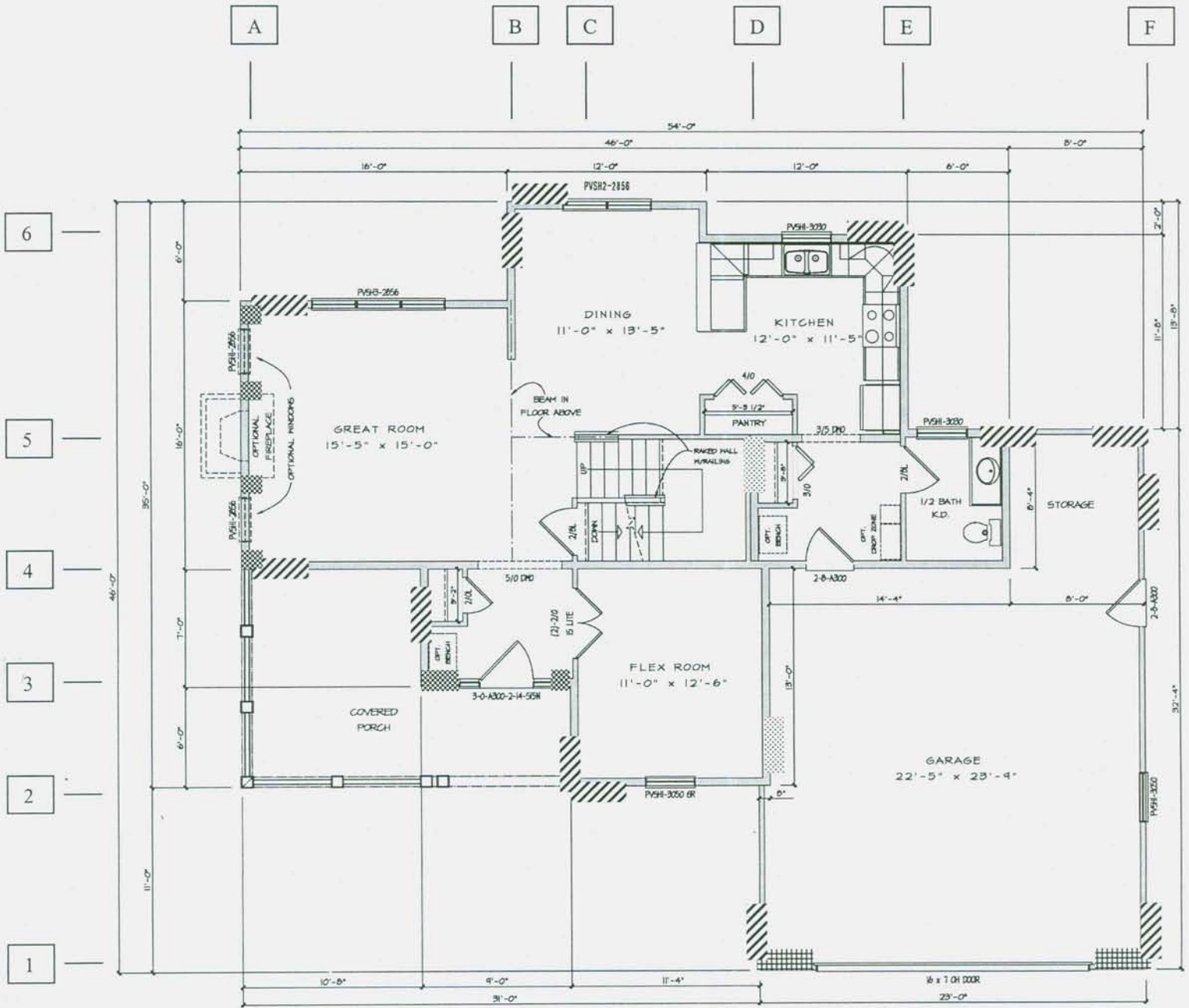


Continuously- sheathed per s. Comm 21.25(9)(c)5., Fig. 21.25-K, W/2 foot return.

Four Feet of Wood Structural Panel Sheathing or Diagonal Bracing

Continuously- sheathed per s. Comm 21.25(9)(c) 2.&3., W/2 foot return.

Four Feet of Gypsum Wallboard Applied to Both Sides of Wall or Diagonal Bracing.

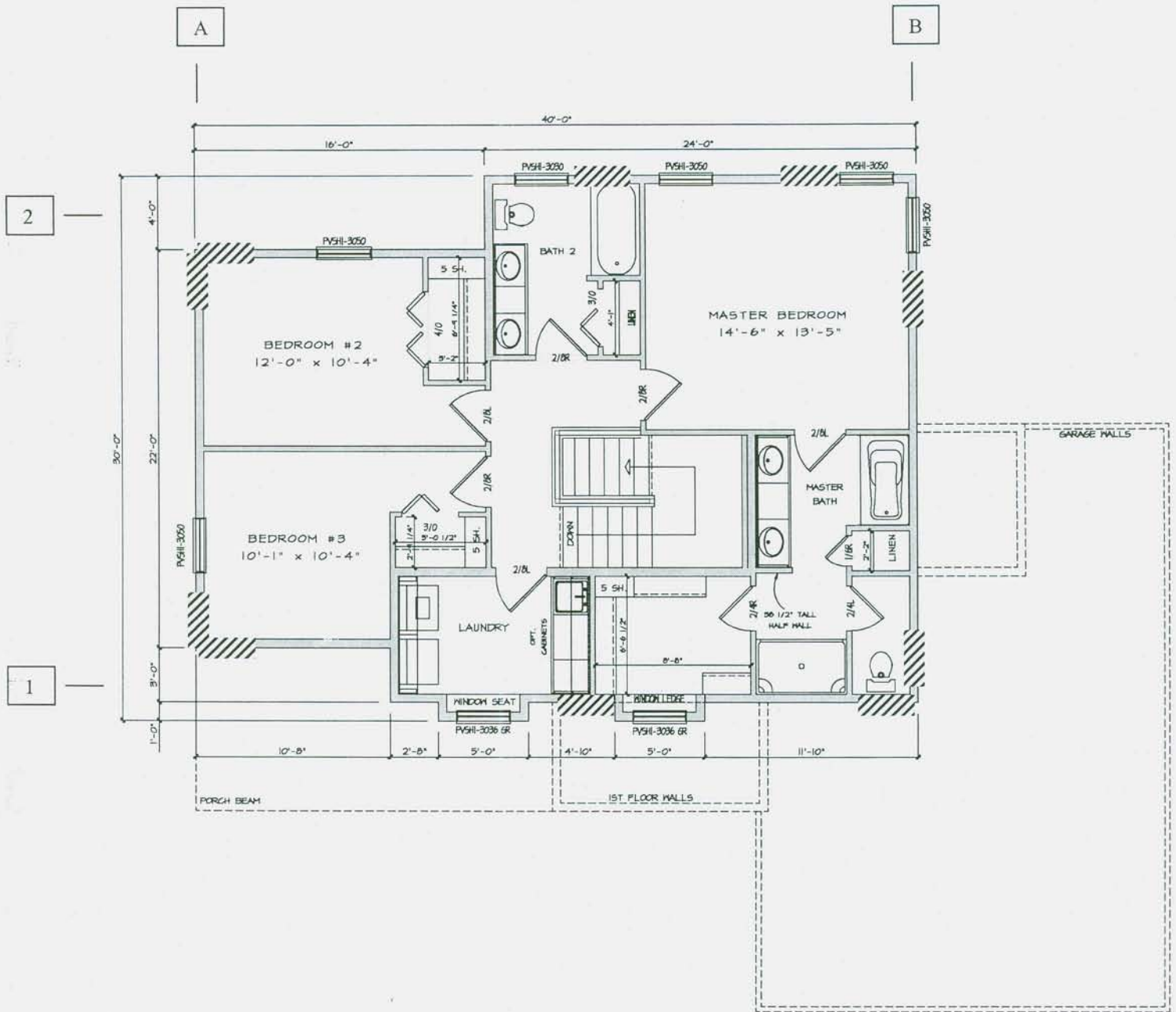


Building #2

Two-Story

First Floor

Four Feet of Wood Structural Panel Sheathing or Diagonal Bracing



Building #2
Two-Story

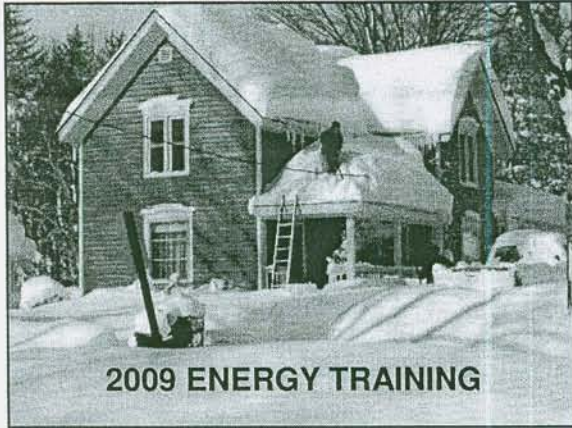
Second Floor

2009 UDC Updates PowerPoint Presentations



◆ Part 3

ENERGY



2009 ENERGY TRAINING

Comm. 22 History

- First draft of the energy Code – 1976
- First effective date – June 1, 1978
- First major revision – April 1, 1999
 - First time a computer program was available (for free) to calculate heat loss
 - First standard design package (without filling out form or running computer program)
- Major Rewrite of this Chapter
 - New standard design packages
 - Updated RESCheck

Comm. 22 - New Energy Stuff

- New Easy-to-Use Prescriptive tables
- New RESCheck Program
- Manual Forms, HVAC Equipment Company Programs, WISCheck, and ***“Rules of Thumbs” All Out -- No Longer an Option!***
- Credits and Benefit Programs
- Geo-thermal, PV, Solar, and *‘Magic Stuff’*

A.B.C. Sizing Guide

American Builders and Contractors

INSTRUCTIONS

1. Stand on sidewalk facing residence (if no sidewalk is present, then position yourself a minimum of 50 ft but no further than 200 ft from front of structure)
2. Hold A.B.C. Sizing Guide at arm's length and peer through string window
3. Make selection

Correction factor

If you're unsure it's really, really HOT! Add 1 TON

If your daddy and his daddy have been sizing this way for 50 years, Add 1 TON

If you think that Manual 2 is from the Dept of Motor Vehicles, Add 1 TON

If you feel sizing is off slightly, more towards or away from larger until desired size is reached

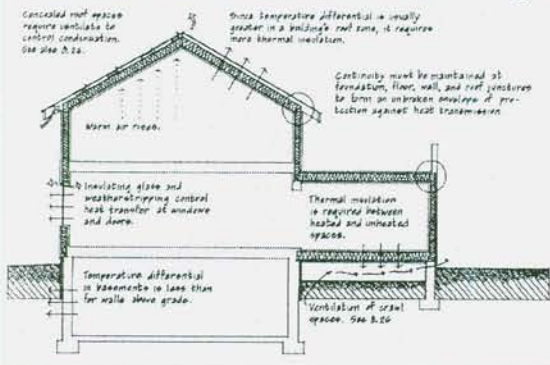
IMPORTANT NOTICE
For improved accuracy, check with the building department for this template



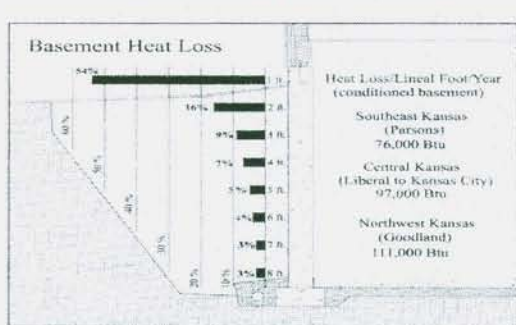
8/17/00

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Thermal Resistance in Dwellings



Foundation Heat Losses



Uninsulated Foundations Lose a Lot of Energy

Comm. 22.31 Prescriptive insulation and fenestration criteria

Table 22.31-1
Insulation and Fenestration Requirements by Component*

Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value	Floor R-Value	Basement or Crawl Space Wall R-Value ^b	Heated Slab R-Value ^c	Floor Protected Slab R-Value ^d
1	0.35	0.60	4 ^e	13 ^f or 13.9 ^g	15	30 ^h	10/13	10/15	10
2	0.35	0.60	4 ^e	21 ^f	19	30 ^h	10/13	10/15	10

- a. R-values are minimums. U-factors are maximums.
 b. The first R-value applies to continuous insulation. The second R-value applies to framing cavity insulation. Either insulation meets the requirement.
 c. The first R-value applies under the entire slab, regardless of depth below grade. The second R-value applies to the slab edge.
 d. The R-value applies to any slab, the bottom of which is less than 4 feet below adjacent grade. See a. Comm. 21.16 for configuration.
 e. See a. Comm. 22.32 (1) for application and permitted reduced R-value.
 f. R-19 and R-21 may be compressed into a 2X6 cavity.
 g. "13+0" means R-13 cavity insulation plus R-3 insulated sheathing. If structural sheathing covers 25% or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25% of the exterior, structural sheathing shall be covered with insulated sheathing of at least R-2.
 h. Or insulation sufficient to fill the framing cavity with a minimum of R-19.

Comm. 22.31 Prescriptive insulation and fenestration criteria

Table 22.31-1
Equivalent U-Factors

Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Wood Frame Wall U-Factor	Mass Wall U-Factor	Floor U-Factor	Basement Wall U-Factor	Crawlspace U-Factor
1	0.35	0.60	0.026	0.060	0.060	0.093	0.085	0.085
2	0.35	0.60	0.026	0.057	0.057	0.093	0.085	0.085

- (2) (a) General. If the total dwelling thermal envelope UA is less than or equal to the total UA resulting from using the U-factors in table 22.31-2 multiplied by the same assembly area as in the proposed building, the dwelling is in compliance with this chapter. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials.

Note: UA is equal to the product of the U-factor times the assembly area.

Note: REScheck and REM/Rate are acceptable software programs for determining compliance with this section.

1 PRODUCT NAME THERMAX™ Sheathing

2 Manufacturer

The Dow Chemical Company
Building Solutions
205 Larkin
Midland, TX 79701
1-866-583-BLUE (2583)
Fax 1-889-622-1465
www.dowbuildingproducts.com

3 Product Description

THERMAX™ Sheathing is a non-structural, rigid board insulation consisting of a glass-fiber-reinforced polyisocyanurate foam core laminated between 1.0 mil uncoated, reflective aluminum foil facers on both sides. The glass-fiber reinforcement, along with chemical modifications, contributes to improved fire performance and dimensional stability. THERMAX Sheathing can be installed exposed to the exterior without a thermal barrier.

BASIC USE
THERMAX™ Sheathing is specially designed to have a Class A fire rating and can be used in a range of concealed and exposed applications, above and below grade, because of its improved fire performance. THERMAX Sheathing is especially appropriate for hourly rated assemblies. THERMAX Sheathing also has approval in exterior masonry steel stud walls with brick cladding. See IBC Section 2603.3.

SIZES

Width and length:
4' x 8', 4' x 9', 4' x 10'

Edge treatments:
Square edge, shiplap

Product thicknesses and R-values are shown in Table 1. Not all products are available in all parts of the country. Additional product sizes are available by custom order.

Thickness/Facet (Nominal in.)	Core Area R-Value ^a
1.5	1.1
2.5	1.8
3.5	2.5

Consult your Dow representative about other sizes and lead-time requirements.

4 Technical Data

APPLICABLE STANDARDS
THERMAX™ Sheathing meets ASTM C1289—Standard Specification for Rigid Cellular Polyisocyanurate Thermal Insulation Board, Type I, Class 2, which includes:

- C203—Standard Test Methods for Breaking Load and Flexure Properties of Block-Type Thermal Insulation
- C209—Smooth Test Methods for Cellulose Fiber Insulating Board
- C538—Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- D1621—Standard Test Method for Compressive Properties of Rigid Cellular Plastics
- D2126—Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging
- C10—Standard Test Method

Comm. 22.32 Specific insulation requirements

- CEILINGS WITH ATTIC SPACES = R-38
- CEILINGS WITHOUT ATTIC SPACES = R-49
- MASS WALLS - requirements of table 22.31-1
– Mass walls that do not meet the specifications under par. (a) for insulation placement shall meet the wood frame wall insulation requirements of table 22.31-1
- STEEL-FRAME CEILINGS, WALLS AND FLOORS - requirements of table 22.32

Steel-Frame Ceiling, Wall & Floor Insulation R-Values

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE*
Steel Truss Ceilings ^b	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
Steel Joist Ceilings ^b	
R-30	R-38 in 2 x 4 or 2 x 6 or 2 x 8 R-49 in any framing
R-38	R-49 in 2 x 4 or 2 x 6 or 2 x 8 or 2 x 10
Steel Framed Wall	
R-13	R-13 + 5 or R-15 + 4 or R-21 + 3
R-19	R-13 + 9 or R-19 + 8 or R-25 + 7
R-21	R-13 + 10 or R-19 + 9 or R-25 + 8
Steel Joist Floor	
R-13	R-19 in 2 x 6 R-19 + 6 in 2 x 8 or 2 x 10
R-19	R-19 + 6 in 2 x 6 R-19 + 12 in 2 x 8 or 2 x 10



Requirements for Dwellings Using Lower Efficiency Appliances

Table 22.31.4
Component Dwelling Thermal Envelope Requirements for Dwellings Using Lower Efficiency Appliances*

Fenestration U-Factor	Skylight U-Factor	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value	Floor R-Value	Basement or Crawl Space Wall R-Value ^b	Heated Slab R-Value ^c	Frost Protected Slab R-Value ^d
0.30	0.50	4 ^e	11 or 19 ^{f,g}	19	3 ^e	15/19 ^f	10/20	15
Equivalent U-factors								
0.30	0.60	0.26	0.057	0.057	0.033	0.045	0.033	0.047

a. R-Values are minimums. U-Factors are maximums.
 b. The first R-value applies to continuous insulation. The second R-value applies to framing cavity insulation.
 c. The first R-value applies under the entire slab, regardless of depth below grade. The second R-value applies to the slab edge.
 d. The R-value applies to any slab, the bottom of which is less than 4 feet below adjacent grade. See s. Comm. 21.16 for configuration.
 e. See s. Comm. 22.32 (1) for application and permitted reduced R-value.
 f. R-19 may be compressed into a 2X6 cavity.
 g. *19+5* means R-19 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25% or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25% of the exterior, structural sheathing shall be covered with insulated sheathing of at least R-2.
 h. C: insulation sufficient to fill the framing cavity with a minimum of R-19.

Comm. 22.35 Thermally isolated sunrooms

- (1) The minimum opaque ceiling insulation R-value shall be R-24. The minimum opaque wall R-value shall be R-13.
- (2) The maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75.
- (3) New walls, windows and doors separating a sunroom from conditioned space shall meet the building thermal envelope requirements.
- (4) The temperature in the conditioned space shall be controlled as a separate zone or shall use separate heating equipment.
- (5) Glazing in a thermally-isolated sunroom is not considered to be in the dwelling thermal envelope.

Comm. 22.36 Fenestration

- (1) **AVERAGE U-FACTORS.** An area-weighted average of fenestration products may be used to satisfy the U-factor requirements.
- (2) **MAXIMUM FENESTRATION U-FACTOR.** The area weighted average maximum fenestration U-factor permitted using trade offs from s. Comm. 22.31 (2) or subchapter VI shall be 0.40 for vertical fenestration, and 0.75 for skylights.
- (3) **GLAZED FENESTRATION EXEMPTION.** Up to 15 square feet of glazed fenestration per dwelling unit may be exempt from U-factor requirements of this chapter.
- (4) **OPAQUE DOOR EXEMPTION.** One opaque door assembly is exempted from the U-factor requirements of this chapter.
- (5) **REPLACEMENT FENESTRATION.** Where an existing fenestration unit is replaced with a new fenestration unit, including sash and glazing, the replacement unit shall meet the U-factor requirements of this chapter.
- (6) **CERTIFIED PRODUCTS.** Except as provided in sub. (7), fenestration rating, certification and labeling of U-factors for windows, doors and skylights shall be in accordance with NFRC 100.

Comm. 22.38 Vapor retarders

- (a) **Definition.** Under this section, a vapor retarder is a material with no intrinsic thermal or structural properties that has a rating of 1.0 perm or less when tested in accordance with ASTM standard E 96, Procedure A.
- (b) **Continuity.** The vapor retarder shall be continuous. All joints in a vapor retarder consisting of sheet material shall be overlapped 6 inches and taped or sealed. Rips, punctures and voids in the vapor retarder shall be patched with vapor retarder materials and taped or sealed.

Comm. 22.38 Vapor retarders (cont.)

- Except as provided under par. (c), all frame walls, frame floors and frame ceilings that comprise the thermal envelope, shall have a vapor retarder installed on the warm-in-winter side of the thermal insulation.
- (b) **Coverage.** The vapor retarder shall cover the exposed insulation and the interior face of the framing.

Comm. 22.38 Vapor retarders (cont.)

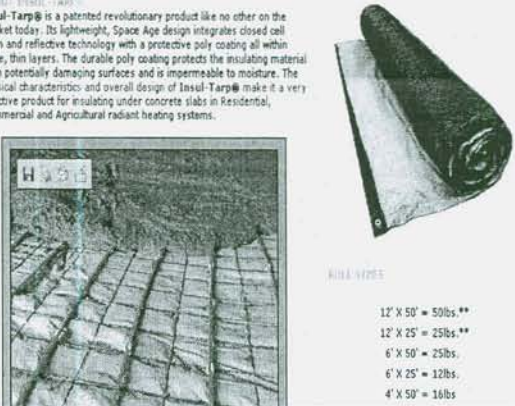
- (c) **Exceptions.** 1. Where the vapor retarder is omitted, as allowed under subds. 2. to 4., all sources of air leakage, such as between double top or bottom plates or between double studs, shall be caulked or sealed.
- 2. No vapor retarder is required in the box sill.
- 3. No vapor retarder is required where batt insulation is provided with foil or kraft paper backing on the warm-in-winter side and the nailing tabs are tightly fastened to the warm-in-winter face of the framing members.
- 4. No vapor retarder is required over cavities that are insulated solely with spray-applied foam unless required by the foam manufacturer.
 - Note:** This requirement does not require the cavity to be completely filled. It only requires that the total required R-value come from the foam, including any exterior foam sheathing, and no other insulation material is present in the cavity.

Comm. 22.38 Vapor retarders (cont.)

(3) CONCRETE FLOORS

- (a) Except as allowed under par. (e), a vapor retarder shall be installed directly under the concrete floor slab or under the base course of concrete floor slabs.
- (b) Vapor retarder material shall be at least 6 mils in thickness or shall be a reinforced material.
- (c) Joints in the vapor retarder shall be overlapped at least 6 inches and taped or sealed.
- (d) The edges of the vapor retarder shall extend up the edges of the slab at least to the top of the slab.
- (e) A vapor retarder is not required under the slab of an unconditioned attached garage.

INSUL-TARP
Insul-Tarp® is a patented revolutionary product like no other on the market today. Its lightweight, Space Age design integrates closed cell foam and reflective technology with a protective poly coating all within three, thin layers. The durable poly coating protects the insulating material from potentially damaging surfaces and is impermeable to moisture. The physical characteristics and overall design of Insul-Tarp® make it a very effective product for insulating under concrete slabs in Residential, Commercial and Agricultural radiant heating systems.



ROLL SIZES

- 12' X 50' = 50lbs.**
- 12' X 25' = 25lbs.**
- 6' X 50' = 25lbs.
- 6' X 25' = 12lbs.
- 4' X 50' = 16lbs.

Comm. 22.38 Vapor retarders (cont.)

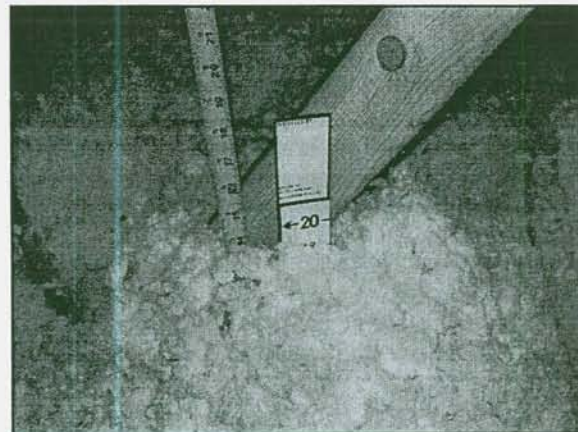
- (4) CONCRETE OR MASONRY BASEMENT WALLS. A non-rigid sheet vapor retarder with a perm rating of 0.1 or less is prohibited in all of the following locations:
 - (a) On a concrete or masonry wall which is below grade to any extent.
 - (b) On an insulated frame wall constructed in front of a concrete or masonry wall which is below grade to any extent.

Comm. 22.42 Duct systems

- (1) Supply and return heating ducts, or portions thereof, that are not located completely within the thermal envelope, shall be provided with insulation with a thermal resistance of at least R-8.
- (2) Building framing cavities may not be used as supply ducts.

Comm. 22.42 Duct systems (cont.)

- (1) Duct systems with joints not located entirely within the conditioned space or with joints located on the unconditioned side of stud bays, joist cavities and similar spaces, shall be sealed in accordance with this section.
- (2) Sealing shall be accomplished using welds, gaskets, mastics, mastic-plus-embedded-fabric systems or tapes installed in accordance with the manufacturer's instructions.
- (3) Insulation that provides a continuous air barrier may be used in lieu of sealing metal ducts.
- (4) Tapes and mastics used with rigid fibrous glass ducts shall be listed and labeled as complying with UL 181A.
- (5) Tapes and mastics used with flexible air ducts shall be listed and labeled as complying with UL 181B.
- (6) Tapes with rubber-based adhesives may not be used.



Comm. 22.43 Duct and plenum

(1) Duct systems with joints not located entirely within the conditioned space or with joints located on the unconditioned side of stud bays, joist cavities and similar spaces, shall be sealed in accordance with this section.

(2) Sealing shall be accomplished using welds, gaskets, mastics, mastic-plus-embedded-fabric systems or tapes installed in accordance with the manufacturer's instructions.

(3) Insulation that provides a continuous air barrier may be used in lieu of sealing metal ducts.

(4) Tapes and mastics used with rigid fibrous glass ducts shall be listed and labeled as complying with UL 181A.

(5) Tapes and mastics used with flexible air ducts shall be listed and labeled as complying with UL 181B.

(6) Tapes with rubber-based adhesives may not be used.

Note: Standard duct tape or "duck tape" has a rubber-based adhesive and does not comply with the requirements of this section.

Comm. 22.45 Air conditioner and heat pump efficiencies

- (1) Heating and cooling equipment shall meet the minimum efficiency requirements in Table 22.45 when tested and rated in accordance with the applicable test procedure.
- (2) The efficiency shall be verified through certification under an approved certification program or, if no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the manufacturer.
- (3) Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all efficiency requirements under this chapter.

Comm. 22.46 Replacement furnace and boiler efficiencies

- (1) A replacement furnace in existing construction may meet only the prevailing federal efficiency standard provided the duct distribution system is sealed including the manufacturer's air handler enclosure, to have air leakage less than ten percent of the furnace manufacturer's rated air flow across the blower at high speed.
- (2) A replacement boiler in existing construction may meet only the prevailing federal standard provided there is no installed circulation pump larger than one-twentieth horsepower and no circulation pump runs continuously.

Comm. 22.44 Pipe insulation

- Heating pipes in unheated spaces shall be insulated with material providing a minimum thermal resistance of R-4 as measured on a flat surface in accordance with ASTM standard C 335 at a mean temperature of 75 °F.



Wood-Fired Heating Brochure

INSPECTION - IF NECESSARY IS REQUIRED

- Since all wood-burning appliances are listed by the Department of Safety, they shall be inspected in accordance with local ordinance for compliance with Comm. 22.45 unless the appliance is placed in operation.
- Fee for inspection in commercial applications shall be in accordance with Comm. 22.54.
- Refrigeration fee shall be in accordance with the manufacturer's requirements.

TRY THE COMMERCE WEBSITE:

Search from the left column to view an image & Product Details to view the following for Use of 3DPC

- Duffon Furnace "80-83 1/2"
- Super Cook "Classic Cooker 4"
- USC Cook "CPL Comm 2022"
- Super Propane "UCS" Boiler"
- Super Compact Propane"
- Intrepid "Crestline" Lignite Boiler
- Intrepid Compact"

Wisconsin
2022

COMMERCIAL INSPECTION DISTRICTS



Dane County Madison 53103	Delafield Delafield 53015	Green County Barab 53009
Franklin County De Pere 53124	Jefferson County Jefferson 53537	Walworth County Keshish 53542
Grant County Grant 54840	Rock County Rock 56208	Washington County Wausau 54981
Lincoln County Lincoln 54601	Waushara County Waushara 54996	Winnebago County Winnebago 54991

* Fee for inspection is \$100 per District. Fee for 2nd District is \$150.

For further questions or details on the requirements of using gas-fired equipment, assistance is available through the Department of Safety.

COMMERCIAL OFFICE: 262-248-8817
MADISON OFFICE: 608-266-8249
MILWAUKEE OFFICE: 414-224-8249



SOLID FUEL-FIRED WATER-HEATING APPLIANCES

John A. P. Kelly, Director
101 W. Washington Avenue, 4th Floor
Madison, WI 53703



Wisconsin Department of Safety
101 W. Washington Avenue, 4th Floor
Madison, WI 53703
Phone: 608-266-8249
Fax: 608-266-8249

Comm. 23.02 (3) (d) Rooms with toilets, tubs or showers

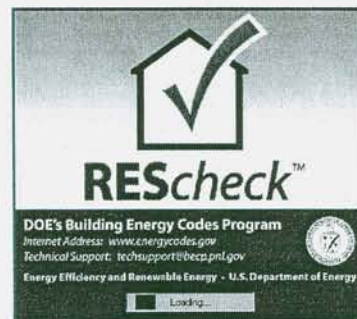
- 1. Except as provided under subd. 2., any room with a toilet, tub or shower shall be provided with exhaust ventilation capable of exhausting 50 cubic feet per minute on an intermittent basis or 20 cubic feet on a continuous basis.
- 2. For dwellings with no electrical service, any room with a toilet, tub or shower shall be provided with an operable window.



Comm. 23.04 (5) WATER HEATERS USED FOR SPACE HEATING

- 1. Water heaters used for space heating shall be listed for such use.
- 2. The data plate shall indicate that the unit is suitable for simultaneous water heating and space heating.
 - **Note:** ANSI Z21.10.1 or ANSI Z 21.10.3 are acceptable listing standards for dual use water heaters.
- (b) *Sizing.* A dual use water heater shall be sized to provide sufficient hot water to supply both the daily and hourly peak loads of the dwelling.
- (c) *Installation.* Dual use water heaters shall be installed to provide both space heating and potable water.
 - **Note:** The Wisconsin Uniform Plumbing Code requires dual use water heaters to be installed by a licensed plumber when installed in a new, not-yet-occupied dwelling. The plumbing code also requires that a floor drain be provided, if the water heater is installed on the lowest floor level and that all piping be suitable for potable water.
- (d) *Heat exchanger.* A single-wall heat exchanger may not be used with a toxic heat transfer fluid.

REScheck 4.3



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