RULES CERTIFICATE

Department of Commerce

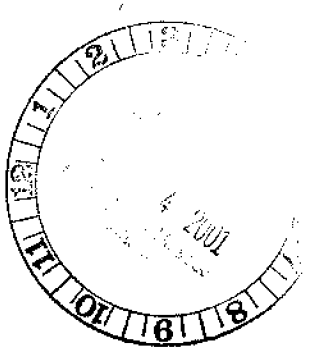
TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Brenda J. Blanchard, Secretary of the Department of Commerce, and custodian of the official records of said department, do hereby certify that the annexed rule(s) relating to

Chs. Comm 20-25, Uniform Dwelling Code

were duly approved and adopted by this department.

I further certify that said copy has been compared by me with the original on file in the department and that the same is a true copy thereof, and of the whole of such original.



IN TESTIMONY WHEREOF, I have hereunto set my hand at 201 West Washington Avenue in the city of Madison, this 2nd day of January A.D. 2001

Secretary

COM-10530 (R.11/97)

4/1/01

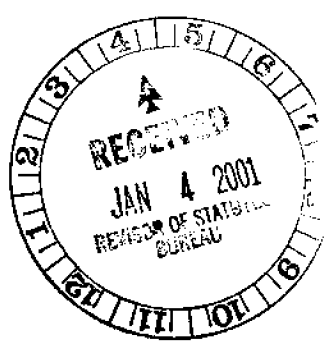
ORDER OF ADOPTION

Department of Commerce

Pursuant to authority vested in the Department of Commerce by section(s) 101.63 (1), 101.64 (3), 101.72 & 101.74 Stats., the Department of Commerce [X] creates; [X] amends; [X] repeals and recreates; [X] repeals and adopts rules of Wisconsin Administrative Code chapter(s):

Comm 20-25 (number) Uniform Dwelling Code (Title)

The attached rules shall take effect on April 1, 2001 pursuant to section 227.22, Stats.



Adopted at Madison, Wisconsin this

date: 1/2/01

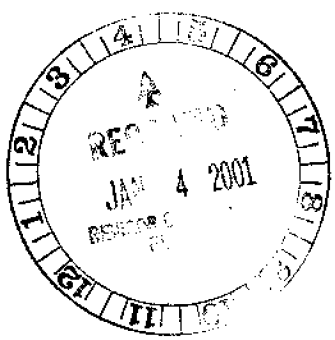
DEPARTMENT OF COMMERCE

Secretary

COM-10529 (N.03/97)

State of Wisconsin \ Department of Commerce

RULES in FINAL DRAFT FORM



Rule No.: Chs. Comm 20-25

Relating to: Uniform (1-2 Family) Dwelling Code

Clearinghouse Rule No.: 00-073

The Wisconsin Department of Commerce proposes an order to repeal ss. Comm 20.04 (3) and (4), 20.05 (8), 20.07 (4m), 20.07 (28) and (28r), 20.07 (41m) and (45), 20.07 (56m) and (60), 20.07 (73m), 21.02 (3) (a) 2. Note and 3., 21.03 (6), 21.04 (1), 21.08 (1) to (4), 21.09 (2), 21.10 (1) and (2), 21.18 Table 21.18-B, 21.25 (1) (b) and (c), 22.06 (19) Note, 23.04 (1) (e), and 23.045 (2) (b);

to renumber ss. Comm 20.04 (1), 20.04 (5), 20.05 (6) to (8), 20.24 (1), 20.24 (4) (f) to (i) and (j) to (p), 21.03 (6m), 21.04 (2) and (3), 21.08 (5) to (7), 21.09 (3) and (4), 21.10 (3), 21.18 Table 21.18-A, 21.25 (1) (d), and 23.02 (3) (b) and (c);

to renumber and amend ss. Comm 20.04 (4), 21.04 (intro.), and 23.045 (2) (c);

to amend ss. Comm 20.07 (47), 20.07 (61), 21.03 (2) (b), 21.04 (title), 21.08 (title), 21.15 (1) (e), 21.17 (3) (d) 4., 21.18 (2) (a), 21.25 (1) (title), 21.25 (3) (b) 3., 21.27 (3) (a) 1. a., 21.30 (9) (c), 22.06 (5) and (15), 22.07 Table 22.07-1, 22.17 (1), 22.25, and 23.04 (title);

to repeal and recreate ss. Comm 20.05 (9) as renumbered, 20.07 (17), 20.07 (36), 20.10 (1) (b) 4., 21.03 (1), 21.03 (5), 21.03 (6) (d) and (e) as renumbered, 21.03 (7), 21.03 (8), 21.04 (4) (a), 21.09 (1), 21.11, 21.18 (1) (b), 21.18 (3), 21.18 Table 21.18-C and Table 21.18-D, 21.22 (1m) and (4), 21.22 (5) (b), 21.24, 21.25 Table 21.25-A (title), 21.25 (2), 21.25 (6), 21.25 Tables 21.25-E and 21.25-F, 21.29 (6) and (9), 21.30 (7) (a), 22.20 Note, 22.27 (2), 22.28 (2), 22.31 (5), 22.33 Note, 23.02 (3) (a), and 23.06;

and to create ss. Comm 20.04 (1) (b) and (c), 20.04 (3), 20.05 (6), 20.07 (10m) and (15g), 20.07 (24m), 20.07 (24r), 20.07 (33m) and (34f), 20.07 (53), (53m) and (55m), 20.24 (1) (b), 20.24 (4) (f) and (k), 21.02 (3) (e), 21.04 (2), 21.08 (1) (c) Note, 21.08 (2) (e), 21.085, 21.09 (4) and (5), 21.10 (1) to (2) and (4), 21.18 (1) (c) and (d), 21.18 Table 21.18-A, 21.18 Tables 21.18-E and 21.18-F, 21.30 (7) (d) and (e), 22.04, 22.08 (1) (d), 22.12 (3), 22.18, 23.02 (3) (b), 23.04 (4), 23.045 (3) (a) 1. Note, 23.062, and 23.14 (3).

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Analysis of Proposed Rules

Statutory Authority: ss. 101.02 (1), 101.63 (1), 101.64 (3), 101.72 and 101.74 Stats.

Statutes Interpreted: ss. 101.02 (1), 101.63 (1), 101.64 (3), 101.72 and 101.74 Stats.

Under the statute sections listed above, the Department of Commerce has the responsibility to adopt rules that establish standards for the construction of 1- and 2-family dwellings. Sections 101.63 (5) and 101.73 (8) require the department to biennially review these rules. This proposed order is the result of the latest review. The vast majority of these proposed rule changes are intended to clarify current policies and requirements. The code sections that are substantially changed under this order are listed below:

S. Comm 20.10 (1) (b) 4. - Adds a limit of 5 business days for the final inspection to be completed prior to occupancy of a dwelling;

S. Comm 21.03 (6) (d) - Allows additional permanent fixtures to be installed under an egress window;

S. Comm 21.04 (3) - Adds rules for curved or irregular landings and winder steps;

S. Comm 21.09 (1) - Adds the requirement for a hard-wired smoke detector with battery backup to be placed inside each bedroom in new construction;

S. Comm 21.11 (1) (c) - Allows foam plastic to be used in the box sill area of the basement without the need to be covered with a thermal barrier;

S. Comm 21.18 is completely recreated to use the latest national standards for masonry block foundation walls;

S. Comm 22.18 - Adds requirements for duct and plenum sealing;

S. Comm 22.31 - Clarifies that nationally-accepted R-values for insulation products must be used to calculate thermal envelope performance; and

S. Comm 23.06 is completely recreated to use national standards for the provision of combustion air for fuel-fired appliances.

SECTION 1. Comm 20.04 (1) is renumbered Comm 20.04 (1) (a).

SECTION 2. Comm 20.04 (1) (b) and (c) are created to read:

Comm 20.04 (1) (b) All dwellings covered under par. (a) shall meet the requirements of ch. Comm 21.

(c) 1. The installation of heating, air conditioning, plumbing or electrical systems is not required.

2. If any of the systems under subd. 1. are installed, the systems and their installation shall comply with this code.

3. If a heating or air conditioning system is installed, the dwelling shall comply with ch. Comm 22.

SECTION 3. Comm 20.04 (3) and (4) are repealed.

SECTION 4. Comm 20.04 (3) is created to read:

Comm 20.04 (3) BED AND BREAKFAST ESTABLISHMENTS. The following portions of a bed and breakfast establishment shall comply with the provisions of this code:

(a) The third floor when used for other than storage.

(b) A structural addition, for which no use other than as a bed and breakfast establishment is proposed.

Note: See s. 254.61, Stats., for further conditions and limitations relating to bed and breakfast establishments.

SECTION 5. Comm 20.04 (5) is renumbered 20.04 (4).

SECTION 6. Comm 20.05 (8) is repealed.

SECTION 7. Comm 20.05 (6) and (7) are renumbered Comm 20.05 (7) and (8).

SECTION 8. Comm 20.05 (6) is created to read:

Comm 20.05 (6) DETACHED DECKS. The provisions of this code do not apply to detached decks provided the deck does not serve an exit from the dwelling.

SECTION 9. Comm 20.05 (9) is created to read:

Comm 20.05 (9) RECREATIONAL VEHICLES AND MANUFACTURED OR MOBILE HOMES. The provisions of this code apply only to onsite installation or construction of an addition or alteration to a recreational vehicle or manufactured or mobile home, such as a stoop, deck, porch or exterior stairs, provided the recreational vehicle or manufactured or mobile home was produced after June 1, 1980.

Note: Chapter Comm 27 applies to the installation of piers if the manufacturer does not specify the pier requirements.

SECTION 10. Comm 20.07 (4m) is repealed.

SECTION 11. Comm 20.07 (10m) and (15g) are created to read:

Comm 20.07 (10m) "Business day" means any day other than Saturday, Sunday or a legal holiday.

(15g) "Coarse aggregate" means granular material, such as gravel or crushed stone, that is predominately retained on a sieve with square openings of 4.75 mm or 0.18 inch.

SECTION 12. Comm 20.07 (17) is repealed and recreated to read:

Comm 20.07 (17) "Combustion air" means the total amount of air necessary for the complete combustion of a fuel.

SECTION 13. Comm 20.07 (24m) is created to read:

Comm 20.07 (24m) "Dilution air" means air that is provided for the purpose of mixing with flue gases in a draft hood or draft regulator.

SECTION 14. Comm 20.07 (24r) is created to read:

Comm 20.07 (24r) "Direct-vent appliance" means a gas-burning appliance that is constructed and installed so that all air for combustion is derived directly from the outside atmosphere and all flue gases are discharged to the outside atmosphere.

SECTION 15. Comm 20.07 (28) and (28r) are repealed.

SECTION 16. Comm 20.07 (33m) and (34f) are created to read:

Comm 20.07 (33m) "Fireblocking" means a material or device used to retard or prevent the spread of flame or hot gases through concealed spaces into adjacent rooms or areas.

(34f) "Flight" means a continuous series of steps with no intermediate landings.

SECTION 17. Comm 20.07 (36) is repealed and recreated to read:

Comm 20.07 (36) "Gas appliance" means any device that uses gas as a fuel or raw material to produce light, heat, power, refrigeration or air conditioning.

SECTION 18. Comm 20.07 (41m) and (45) are repealed.

SECTION 19. Comm 20.07 (47) is amended to read:

Comm 20.07 (47) "Landing" means the level portion of a stairs located ~~within a flight~~ between flights of stairs or located at the ~~base~~ top and foot of a stairs.

SECTION 20. Comm 20.07 (53), (53m) and (55m) are created to read:

Comm 20.07 (53) "Mechanical draft venting system" means a venting system for a gas burning appliance that is designed to remove flue or vent gases by mechanical means, such as a fan, which may consist of an induced draft portion under non-positive static pressure or a forced draft portion under positive static pressure.

(53m) "Multiple station smoke alarm" means an assembly that incorporates the smoke detector, the control equipment and the alarm-sounding device in one unit that is capable of being interconnected with one or more additional alarms so that the actuation of one alarm causes the operation of all interconnected alarms.

(55m) "Naturally vented appliance" means an appliance with a venting system designed to remove flue or vent gases under non-positive static vent pressure entirely by natural draft.

SECTION 21. Comm 20.07 (56m) and (60) are repealed.

SECTION 22. Comm 20.07 (61) is amended to read:

Comm 20.07 (61) "Repair" means the act or process of restoring to original soundness, including~~, but not limited to,~~ redecorating, refinishing, nonstructural repairs or maintenance, ~~repairs~~ or the replacement of existing fixtures, systems or equipment with the equivalent fixture, system or equipment.

SECTION 23. Comm 20.07 (73m) is repealed.

SECTION 24. Comm 20.10 (1) (b) 4. is repealed and recreated to read:

Comm 20.10 (1) (b) 4. 'Final inspection.' a. Except as provided under subd. 4. b., the dwelling may not be occupied until a final inspection has been made that finds no critical violations of this code that could reasonably be expected to affect the health or safety of a person using the dwelling.

b. Occupancy may proceed in accordance with local ordinances if the inspection has not been completed within 5 business days after notification or as otherwise agreed between the applicant and the department or municipality.

SECTION 25. Comm 20.24 (1) is renumbered (1) (a).

SECTION 26. Comm 20.24 (1) (b) is created to read:

Comm 20.24 (1) (b) BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES, ACI-530-99 and SPECIFICATION FOR MASONRY STRUCTURES, ACI 530.1-99.

SECTION 27. Comm 20.24 (4) (f) to (i) are renumbered (g) to (j) and (j) to (p) are renumbered (L) to (r).

SECTION 28. Comm 20.24 (4) (f) and (k) are created to read:

Comm 20.24 (4) (f) STANDARD SPECIFICATION FOR GROUT FOR MASONRY, ASTM C 476-99.

(k) STANDARD CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOIL CLASSIFICATION SYSTEM), ASTM D 2487-98.

SECTION 29. Comm 20.24 (9) is amended to read:

Comm 20.24 (9) National Fire Protection Association, (NFPA), Batterymarch Park, Box 9101, Quincy, Massachusetts 02269. NATIONAL FUEL GAS CODE, NFPA 54-~~1996~~ 1999, ~~Parts~~ Chapters 2, 3, and 4.

SECTION 30. Comm 21.02 (3) (a) 2. Note and 3. are repealed.

SECTION 31. Comm 21.02 (3) (e) is created to read:

Comm 21.02 (3) (e) *Engineered structural components.* Engineered structural components shall be used in accordance with structural analysis or with load tables supplied by the manufacturer, provided those load tables were developed using structural analysis or load testing.

SECTION 32. Comm 21.03 (1) is repealed and recreated to read:

Comm 21.03 (1) EXITS FROM THE FIRST FLOOR. (a) Every dwelling unit shall be provided with at least 2 exits from the first floor.

(b) At least one of the exits shall discharge to grade. This exit may include interior or exterior stairs.

(c) An additional exit may discharge to an outside balcony that complies with sub. (10).

(d) An additional exit may discharge into an attached garage provided the garage has an exit door that discharges to grade. An overhead garage door may not be used as an exit door.

(e) The 2 required exits shall be located as far apart as practical.

Note: See appendix for examples of exit separation design.

SECTION 33. Comm 21.03 (2) (b) is amended to read:

Comm 21.03 (2) (b) Except as provided in par. (c), windows which comply with sub. ~~(6m)~~ (6) may be provided in each second floor bedroom in lieu of the second exit from the floor.

SECTION 34. Comm 21.03 (5) is repealed and recreated to read:

Comm 21.03 (5) EXITS FROM BASEMENTS AND GROUND FLOORS. (a) *General.* All basements and ground floors shall be provided with at least one exit of the following types:

1. A door to the exterior of the dwelling.

2. A stairway or ramp that leads to the floor above.

(b) *Basements and ground floors used for sleeping.* 1. Basements and ground floors used for sleeping shall be provided with at least 2 exits.

2. The exits shall be located as far apart as practical.

3. The exits may not be accessed from the same ramp or stairway.

4. In addition to the exit type required under par. (a), the second exit from a basement or ground floor used for sleeping shall be one of the following types:

a. A door to the exterior of the dwelling.

b. A stairway or ramp that leads to the floor above.

c. A stairway that leads to a garage provided the garage has an exit door other than the overhead door.

d. An egress window that complies with sub. (6), located in each bedroom.

SECTION 35. Comm 21.03 (6) is repealed.

SECTION 36. Comm 21.03 (6m) is renumbered (6).

SECTION 37. Comm 21.03 (6) (d) and (e), as renumbered, are repealed and recreated to read:

Comm 21.03 (6) (d) 1. For any window used for exiting, the lowest point of clear opening shall be no more than 60 inches above the floor.

2. If the lowest point of clear opening is more than 46 inches above the floor, a permanent platform or fixture shall be installed such that a flat surface at least 20 inches wide and 9 inches deep is located no more than 46 inches directly below the clear opening.

3. The topmost surface of the platform or fixture shall be no more than 24 inches above the floor.

4. The topmost surface of the platform or fixture shall support a live load of at least 200 pounds.

5. A step used for the sole purpose of reaching the top of the platform or fixture is exempt from the requirements of s. Comm 21.04.

(e) 1. An egress window with any point of clear opening below adjacent grade shall be provided with an areaway in accordance with this section.

2. The width of the areaway shall be at least equal to the width of the window.

3. The areaway shall be a minimum of 36 inches measured perpendicular from the outer surface of the below-grade wall.

4. If the bottom of the areaway is more than 46 inches below adjacent grade or the top of the areaway enclosure, the areaway shall be provided with a ladder or at least one additional step to aid egress. Steps used to comply with this section are exempt from the requirements of s. Comm 21.04.

5. Ladders or other steps used to comply with subd. 4. may infringe on the required area of the areaway by a maximum of 6 inches.

6. The areaway shall be constructed such that water entering the areaway does not enter the dwelling.

SECTION 38. Comm 21.03 (7) is repealed and recreated to read:

Comm 21.03 (7) DOORS USED FOR EXITING. Doors used for exiting shall comply with the following requirements:

(a) One of the exit doors from a dwelling unit shall be a swing-type door at least 36 inches wide by 80 inches high.

(b) 1. Except as allowed under subd. 2., all other required exit doors shall be at least 32 inches wide by 76 inches high.

2. Sliding patio doors used as a required exit shall have a clear opening of at least 30 inches.

(c) Where double doors are used as a required exit, each door leaf shall be at least 30 inches wide and the doors may not have an intermediate mullion.

(d) All exit doors shall be openable from the interior without the use of a key.

SECTION 39. Comm 21.03 (8) is repealed and recreated to read:

Comm 21.03 (8) INTERIOR CIRCULATION. All doors or openings to the following areas shall be at least 80 inches high and either provide a minimum net clear opening width of 30 inches or be a 32-inch door:

(a) At least 50 % of the bedrooms.

(b) All common use areas including kitchens, dining rooms, living rooms, family rooms, basements and garages.

(c) At least one full bathroom, including doors or openings to the sink, toilet and tub or shower.

SECTION 40. Comm 21.04 (title) is amended to read:

Comm 21.04 (title) **~~Stairs~~ Stairways and elevated areas.**

SECTION 41. Comm 21.04 (1) is repealed.

SECTION 42. Comm 21.04 (intro.) is renumbered Comm 21.04 (1) and amended to read:

Comm 21.04 (1) (title) SCOPE. Every interior and exterior ~~stairs~~ stairway, including tub access steps but excluding non-required basement ~~stairs~~ stairways which lead directly to the building exterior and ~~stairs~~ stairways leading to attics or crawl spaces, shall conform to the requirements of this section.

SECTION 43. Comm 21.04 (2) and (3) are renumbered Comm 21.04 (3) and (4).

SECTION 44. Comm 21.04 (2) is created to read:

Comm 21.04 (2) DETAILS. (a) *Width.* 1. Except for spiral staircases under subd. 2., stairways shall measure at least 36 inches in width. Handrails and associated trim may project a maximum of 4.5 inches into the required width at each side of the stairway.

2. Spiral staircases shall be at least 26 inches wide measured from the outer edge of the supporting column to the inner edge of the handrail.

(b) *Riser height.* 1. Except for spiral staircases under subd. 2., risers may not exceed 8 inches in height measured vertically from tread to tread.

2. Risers in spiral staircases may not exceed 9.5 inches in height measured vertically from tread to tread.

(c) *Tread depth.* 1. 'Rectangular treads.' Rectangular treads shall have minimum tread depth of 9 inches measured horizontally from nosing to nosing.

2. 'Spiral staircase treads.' Spiral staircase treads shall have a minimum tread depth of 7 inches from nosing to nosing measured at a point 12 inches from the narrow end of the tread.

3. 'Winder treads in series.' Two or more winder treads may be placed immediately adjacent to each other anywhere in a stairway provided both of the following conditions are met:

a. The winder treads shall have a minimum tread depth of 7 inches measured at a point 12 inches from the narrow end of the tread.

b. The depth of the immediately adjoining winder treads shall be equal at a point 12 inches from the narrow end.

4. 'Individual winder treads.' a. An individual winder tread may be placed between rectangular treads or at the end of a flight of rectangular treads provided the tread depth, measured at a point 12 inches from the narrow end, is equal to the tread depth of the rectangular steps in the flight.

b. There may be more than one individual winder tread in a stairway or in a flight of stairs.

(d) *Headroom.* 1. Stairways shall be provided with a minimum headroom clearance of 76 inches measured vertically from a line parallel to the nosing of the treads to the ceiling, soffit or any overhead obstruction directly above that line.

2. The headroom clearance shall be maintained over an intermediate landing.

3. The headroom clearance shall be maintained over a landing that is at the top or bottom of a stairway for a minimum distance of 36 inches in the direction of travel of the stairway.

(e) *Uniformity.* 1. Within a stairway flight, tread widths and riser heights may vary by a maximum of 3/16 inch.

2. The allowed variation in uniformity under subd. 1. may not be used to exceed the maximum riser height under par. (b) or to decrease the minimum tread depth under par. (c).

SECTION 45. Comm 21.04 (4) (a), as renumbered, is repealed and recreated to read:

Comm 21.04 (4) (a) *Intermediate landings.* 1. A level intermediate landing shall be provided in any stairway with a height of 12 feet or more.

2. Intermediate landings that connect 2 or more straight flights of stairs, or 2 flights of stairs at a right angle, shall be at least as wide as the stairway and shall measure at least 36 inches in the direction of travel.

3. Curved or irregular landings shall have a radius of at least 36 inches.

4. Curved or irregular landings shall have a minimum straight line measurement of 26 inches between the nosing of the 2 connecting treads measured at a point 18 inches from the narrow end of the landing measured along the nosing of the 2 treads.

SECTION 46. Comm 21.08 (title) is amended to read:

Comm 21.08 (title) ~~Firestopping, draftstopping and fire~~ Fire separation and living unit separation.

SECTION 47. Comm 21.08 (1) to (4) are repealed.

SECTION 48. Comm 21.08 (5) to (7) are renumbered (1) to (3).

[Note to Revisor: Please remove the "3/4" that appears at the end of the (renumbered) 21.08 (1) (intro.).]

SECTION 49. Comm 21.08 (1) (c) Note is created to read:

Comm 21.08 (1) (c) **Note:** Acceptable tests for fire rating of door assemblies include ASTM E-152, UL 10B, and NFPA 252.

SECTION 50. Comm 21.08 (2) (e) is created to read:

Comm 21.08 (2) (e) *Attics and concealed roof spaces.* 1. Attic areas, mansards, overhangs and other concealed roof spaces shall be totally separated above and in line with the tenant separation wall.

2. Acceptable attic separation materials include:

a. 2-inch nominal lumber.

b. Two layers of one-inch nominal lumber.

c. 1/2-inch nominal plywood or wood structural panel.

d. 1/2-inch gypsum board.

e. Fiberglass or mineral wool batt insulation may be used in an unsupported condition provided the least dimension of the opening does not exceed 4 inches.

SECTION 51. Comm 21.085 is created to read:

Comm 21.085 Fireblocking. (1) FIREBLOCKING LOCATIONS. Fireblocking shall be provided in all of the following locations:

(a) In concealed spaces of walls and partitions, including furred spaces, at the ceiling and floor levels.

(b) At all interconnections between concealed vertical and horizontal spaces.

(c) In concealed spaces between stair stringers at the top and bottom of the run and at any intervening floor level.

(d) At all openings around wires, cables, vents, pipes, ducts, chimneys and fireplaces at ceiling and floor level.

(2) FIREBLOCKING MATERIALS. Fireblocking shall consist of one of the following:

(a) 2-inch nominal lumber.

(b) Two layers of one-inch nominal lumber.

(c) One thickness of 3/4-inch nominal plywood or wood structural panel with any joints backed with the same material.

(d) One thickness of 1/2-inch gypsum wallboard, face nailed or face screwed to solid wood, with any joints backed with the same material.

(e) Fiberglass or mineral wool batt insulation may be used if both of the following conditions are met:

1. The least dimension of the opening may not exceed 4 inches.

2. The batt shall be installed to fill the entire thickness of the opening or stud cavity.

(f) For wires, cables, pipes and vents only, non-shrinking caulk, putty, mortar, or similar material may be used provided no dimension of the opening exceeds 1/2 inch around the penetrating object.

(g) For chimneys, fireplaces and metal vents, fireblocking shall be metal, cement board or other noncombustible material.

SECTION 52. Comm 21.09 (1) is repealed and recreated to read:

Comm 21.09 (1) A listed and labeled multiple-station smoke alarm with battery backup shall be installed in all of the following locations:

(a) An alarm shall be installed inside each sleeping room.

(b) On floor levels that contain one or more sleeping areas, an alarm shall be installed outside of the sleeping rooms, in the vicinity of each sleeping area.

(c) On floor levels that do not contain a sleeping area, an alarm shall be installed in a common area on each floor level.

[Note to Revisor: Please retain the 3 footnotes under sub. (1).]

SECTION 53. Comm 21.09 (2) is repealed.

SECTION 54. Comm 21.09 (3) and (4) are renumbered Comm 21.09 (2) and (3).

SECTION 55. Comm 21.09 (4) and (5) are created to read:

Comm 21.09 (4) Smoke alarms and detectors shall be maintained in accordance with the manufacturer's specifications.

Comm 21.09 (5) For envelope dwellings, at least 3 smoke alarms shall be placed in the air passageways. The alarms shall be placed as far apart as possible.

SECTION 56. Comm 21.10 (1) and (2) are repealed.

SECTION 57. Comm 21.10 (3) is renumbered Comm 21.10 (5).

SECTION 58. Comm 21.10 (1) to (2) and (4) are created to read:

Comm 21.10 (1) Wood used in any of the locations specified under this section shall meet both of the following requirements:

(a) The wood shall be pressure treated with preservative or shall be a naturally durable and decay-resistant species or shall be engineered to be decay resistant.

(b) The wood shall be pressure treated with preservative or shall be naturally termite-resistant unless additional steps are taken to make the wood termite-resistant.

(2) Wood used in the following locations shall be as required under sub. (1):

(a) Embedded in earth.

(b) Floor joists that span directly over and within 18 inches of earth.

(c) Girders that span directly over and within 12 inches of earth.

(d) Sills and rim joists that rest on concrete or masonry and are within 8 inches above exterior grade.

(e) Siding within 6 inches of earth.

(f) Ends of wood structural members built into masonry or concrete walls and having clearances of less than 1/2 inch on the top, sides and ends.

(g) Bottom plates of load bearing walls on slab floors in basements or garages.

(h) Bottom plates of garage walls that rest on concrete or masonry and are within 8 inches of exterior grade.

(i) Columns in direct contact with concrete or masonry unless supported by a structural pedestal or plinth block at least 3 inches above the floor.

(j) Any structural part of an outdoor deck, including the decking.

(4) Wood girders that rest directly on exterior concrete or masonry shall be protected by one of the following methods:

(a) The wood shall be pressure treated with preservative or shall be a naturally durable and decay-resistant species.

(b) Material, such as pressure-treated plywood, flashing material, steel shims, or water resistant membrane material shall be placed between the wood and the concrete or masonry.

SECTION 59. Comm 21.11 is repealed and recreated to read:

Comm 21.11 Foam plastic. (1) (a) *General.* Foam plastic insulation shall have a flame-spread rating of 75 or less and a smoke-developed rating of 450 or less when tested in accordance with ASTM E-84.

(b) *Thermal barrier.* Except as provided in par. (c), foam plastic shall be separated from the interior of the dwelling by one of the following thermal barriers:

1. 1/2-inch gypsum wallboard.

2. 1/2-inch nominal wood structural panel.

3. 3/4-inch sawn lumber with tongue-and-groove or lap joints.

4. 1-inch of masonry or concrete.

5. A product or material shown by an independent laboratory to limit the temperature rise on the unexposed surface to 250°F for 15 minutes when tested in accordance with ASTM E-119.

6. For doors only, sheet metal with a minimum thickness of 26 standard steel gauge or aluminum with a minimum thickness of 0.032-inch.

Note: Number 26 standard steel gauge is approximately equal to 0.018-inch.

(c) *Exemptions from thermal barrier requirement.* The following applications of foam plastic do not require a thermal barrier:

1. On overhead garage doors.

2. In the box sill of the basement or ground floor, above the bottom of the floor joists.

(2) Insulation that does not meet the requirements of this section may be approved by the department in accordance with s. Comm 20.18. Approval will be based on tests that evaluate materials or products representative of actual end-use applications.

SECTION 60. Comm 21.15 (1) (e) is amended to read:

Comm 21.15 (1) (e) Floating slabs. Any dwelling supported on a floating slab on grade shall be designed through structural analysis. Structures supported on floating slabs may not be physically attached to structures that are supported by footings that extend below the frost line unless ~~a control~~ an isolation joint is used between the structures.

SECTION 61. Comm 21.17 (3) (d) 4. is amended to read:

Comm 21.17 (3) (d) 4. The tile or pipe shall be placed upon at least 2 inches of ~~washed rock~~ coarse aggregate and shall be covered on the top and the side facing away from the dwelling with at least 12 inches of ~~washed rock~~ coarse aggregate that meets all of the following criteria:

a. 100% of the aggregate shall pass a 1 inch sieve.

~~a.~~ b. 90-100% of the ~~rock~~ aggregate shall pass a 3/4 inch sieve.

~~b.~~ c. ~~20-25%~~ 0-55% of the ~~rock~~ aggregate shall pass a 3/8 inch sieve.

d. 0-5 % of the aggregate shall pass a #8 sieve.

Note 1: A #8 sieve has square openings of 2.36 mm or 0.09 inch.

Note 2: These specifications encompass aggregate sizes #6 and #67 per ASTM standard C 33. Of the two sizes, #6 is coarser.

SECTION 62. Comm 21.18 (1) (b) is repealed and recreated to read:

Comm 21.18 (1) (b) *Lateral support at base.* Lateral support such as floor slabs or framing shall be provided at the base of foundation walls.

SECTION 63. Comm 21.18 (1) (c) and (d) are created to read:

Comm 21.18 (1) (c) *Lateral support at top.* Lateral support shall be provided at the top of the foundation walls by one of the following:

1. 'Ledger blocks.' Ledger blocks at the perimeter of the floor consisting of 2 inch thick nominal lumber attached with at least two 16d nails at each joist such that the dwelling meets the requirements of s. Comm 21.02 (1) (d).

2. 'Structural analysis.' A system designed through structural analysis.

3. 'Anchor bolts.' a. Structural steel anchor bolts, at least 1/2 inch in diameter, embedded at least 7 inches into the grouted masonry with a maximum spacing of 72 inches and located within 18 inches of wall corners.

b. A properly sized nut and washer shall be tightened on each bolt to the plate or sill.

c. When vertical-reinforcing steel is provided in masonry construction, as required under sub. (3), the location requirements under subd. 3. a. shall be modified as necessary so anchor bolts are placed in the same core as the reinforcement without exceeding the limits of subd. 3. a.

4. 'Other mechanical fasteners.' a. Mechanical fasteners used in accordance with the manufacturer's testing and listing.

b. When vertical-reinforcing steel is provided in masonry construction, as required under sub. (3), the location requirements under subd. 4. a. shall be modified as necessary so the fasteners are placed in the same core as the reinforcement without exceeding the limits of subd. 4. a.

(d) *Soil lateral load.* Unless designed through structural analysis, soil lateral loads shall be determined from Table 21.18-A.

SECTION 64. Comm 21.18 (2) (a) is amended to read:

Comm 21.18 (2) CONCRETE FOUNDATION WALLS. (a) Except as provided in par. (b), unless designed through structural analysis, the minimum thickness of concrete foundation walls shall be determined from Table ~~21.18-A~~ 21.18-B, but in no case shall the thickness of the foundation wall be less than the thickness of the wall it supports.

SECTION 65. Comm 21.18 (3) is repealed and recreated to read:

Comm 21.18 (3) MASONRY FOUNDATION WALLS. (a) *Dampproofing.* Masonry foundation walls shall be dampproofed by applying to the exterior surface from footing to finished grade, a continuous coating of one of the following:

1. Portland cement and sand coat mortar, at least 3/8 inch thick.

2. Type M or S mortar, at least 3/8 inch thick.

3. Structural surface bonding material, at least 1/4 inch thick.

4. Equivalent dampproofing material, applied in accordance with the manufacturer's instructions and acceptable to the department.

(b) *Structural requirements*. Unless designed through structural analysis, the masonry foundation walls shall be constructed in accordance with ACI 530.1 and the following requirements:

1. The minimum thickness of unreinforced masonry foundation walls shall be determined by Table 21.18-C, but in no case shall the thickness be less than the thickness of the wall it supports.

2. Reinforced masonry walls shall be reinforced in accordance with the requirements of Tables 21.18-D, 21.18-E or 21.18-F. Vertical reinforcement shall be provided on each side of any opening and at intervals indicated in the appropriate table.

3. Vertical reinforcement shall have a minimum yield strength of 60,000 psi.

4. Solid-grouted hollow units or cores containing vertical reinforcement shall be filled with masonry grout that complies with ASTM C 476.

5. In lieu of the reinforcement provisions of Tables 21.18-D, 21.18-E and 21.18-F, alternative reinforcing bar size and spacing having an equivalent cross-sectional area or reinforcement per linear foot of wall is permitted, provided the spacing of the reinforcement does not exceed 72 inches and reinforcing bar size does not exceed No. 11.

6. The depth below grade, wall height and reinforcement spacing may exceed the maximum values indicated in Tables 21.18-D, 21.18-E and 21.18-F only if the design is based on structural analysis.

SECTION 66. Comm 21.18, Table 21.18-B is repealed.

SECTION 67. Comm 21.18, Table 21.18-A is renumbered Table 21.18-B.

SECTION 68. Comm 21.18, Table 21.18-A is created to read:

TABLE 21.18-A
SOIL LATERAL LOAD

Description of Backfill Material[e]	Unified Soil Classification	Design Lateral Soil Load[a] PSF per Foot of Depth
Well-graded, clean gravels; gravel-sand mixes	GW	30 [c]
Poorly graded clean gravels; gravel-sand mixes	GP	30 [c]
Silty gravels, poorly graded gravel-sand mixes	GM	40 [c]
Clayey gravels, poorly graded gravel-and-clay mixes	GC	45 [c]
Well-graded, clean sands; gravelly sand mixes	SW	30 [c]
Poorly graded clean sands: sand-gravel mixes	SP	30 [c]
Silty sands, poorly graded sand-silt mixes	SM	45 [c]
Sand-silt clay mix with plastic fines	SM-SC	45 [d]
Clayey sands, poorly graded sand-clay mixes	SC	60 [d]
Inorganic silts and clayey silts	ML	45 [d]
Mixture of inorganic silt and clay	ML-CL	60 [d]
Inorganic clays of low to medium plasticity	CL	60 [d]
Organic silts and silt clays, low plasticity	OL	[b]
Inorganic clayey silts, elastic silts	MH	[b]
Inorganic clays of high plasticity	CH	[b]
Organic clays and silty clays	OH	[b]

a. Design lateral soil loads are given for moist conditions for the specified soils at their optimum densities. Actual field conditions shall govern. Submerged or saturated soil pressures shall include the weight of the buoyant soil plus the hydrostatic loads.

b. Unsuitable as backfill material.

c. For relatively rigid walls, as when braced by floors, the design lateral soil load shall be increased for sand and gravel type soils to 60 psf per foot of depth. Basement walls extending not more than 8 feet below grade and supporting flexible floor systems are not considered relatively rigid walls.

d. For relatively rigid walls, as when braced by floors, the design lateral load shall be increased for silt and clay type soils to 100 psf per foot of depth. Basement walls extending not more than 8 feet below grade and supporting flexible floor systems are not considered relatively rigid walls.

e. The definition and classification of soil materials shall be in accordance with ASTM D2487.

SECTION 69. Comm 21.18, Table 21.18-C and Table 21.18-D are repealed and recreated to read:

Table 21.18-C
PLAIN MASONRY FOUNDATION WALLS [d]

Maximum Wall Height (ft - in)	Depth of unbalanced backfill height (ft)	Minimum nominal wall thickness (inches)		
		Soil classes and lateral soil load[a] (psf per foot of depth)		
		GW, GP, SW and SP soils 30	GM, SM, SM-SC, ML, inorganic CL and ML-CL soils 45	GC, SC and MH soils 60
7 - 0 7 - 8	4 (or less)	8	8	8
	5	8	10	10
	6	10	12	10 (solid[b])
	7	12	10 (solid[b])	12 (solid[b])
8 - 4	4 (or less)	8	8	8
	5	8	10	12
	6	10	12	12 (solid[b])
	7	12	12 (solid[b])	Note c
	8	10 (solid[b])	12 (solid[b])	Note c
9 - 1	4 (or less)	8	8	8
	5	8	10	12
	6	12	12	12 (solid[b])
	7	12 (solid[b])	12 (solid[b])	Note c
	8	12 (solid[b])	Note c	Note c
	9	Note c	Note c	Note c

a. For design lateral soils and descriptions of soil classes, see s. Comm 21.18(1)(d). Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.

b. Solid grouted hollow units.

c. An analysis in compliance with ACI 530 or reinforcement in accordance with Table 21.18-D, 21.18-E or 21.18-F is required.

d. Mortar shall be Type M or S and masonry shall be laid in running bond.

TABLE 21.18-D [b,c,d]

8, 10 OR 12 IN. REINFORCED MASONRY FOUNDATION WALLS WHERE d ≥ 5 in.[e]

Maximum Wall Height (ft - in)	Height of unbalanced backfill (ft)	Vertical reinforcement		
		Soil classes and lateral soil load[a] (psf per foot of depth)		
		GW, GP, SW and SP soils 30	GM, GC, SM, SM-SC and ML soils 45	SC, MH, ML-CL and inorganic CL soils 60
7 – 0	4 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
7 – 8	5	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 40" o.c.
	6	#4 at 48" o.c.	#5 at 48" o.c.	#5 at 40" o.c.
	7	#4 at 40" o.c.	#5 at 40" o.c.	#6 at 48" o.c.
8 - 4	4 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 40" o.c.
	6	#4 at 48" o.c.	#5 at 48" o.c.	#5 at 40" o.c.
	7	#5 at 48" o.c.	#6 at 48" o.c.	#6 at 40" o.c.
	8	#5 at 40" o.c.	#6 at 40" o.c.	#7 at 40" o.c.
9 - 1	4 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5	#4 at 48" o.c.	#4 at 48" o.c.	#5 at 48" o.c.
	6	#4 at 48" o.c.	#5 at 48"o.c.	#6 at 48" o.c.
	7	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
	8	#5 at 40" o.c.	#7 at 48" o.c.	#8 at 48" o.c.
	9	#6 at 40" o.c.	#8 at 48" o.c.	#8 at 32" o.c.

a. For design lateral soil loads, see s. Comm 21.18(1)(d). Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.

b. Provisions for this table are based on construction requirements specified in s. Comm 21.18 (3) (b).

c. For alternative reinforcement, see s. Comm 21.18 (3) (b).

d. Mortar shall be Type M or S and masonry shall be laid in running bond.

e. The specified location of the reinforcement shall equal or exceed the effective depth distance, d, measured from the face of the soil side of the wall to the center of vertical reinforcement.

SECTION 70. Comm 21.18, Tables 21.18-E and 21.18-F are created to read:

TABLE 21.18-E [b,c,d]
10 OR 12 IN. REINFORCED MASONRY FOUNDATION WALLS WHERE d ≥ 6.75 in.[e]

REINFORCED MASONRY				
Maximum Wall Height (ft – in)	Height of unbalanced backfill (ft)	Vertical reinforcement		
		Soil classes and lateral soil load[a] (psf per foot below natural grade)		
		GW, GP, SW and SP soils 30	GM, GC, SM, SM-SC and ML soils 45	SC, MH, ML-CL and inorganic CL soils 60
7 – 0	4 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
7 – 8	5	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6	#4 at 56" o.c.	#4 at 48" o.c.	#4 at 40" o.c.
	7	#4 at 56" o.c.	#5 at 56" o.c.	#5 at 40" o.c.
8 – 4	4 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 48" o.c.
	6	#4 at 56" o.c.	#4 at 48" o.c.	#5 at 56" o.c.
	7	#4 at 48" o.c.	#4 at 32" o.c.	#6 at 56" o.c.
	8	#5 at 56" o.c.	#5 at 40" o.c.	#7 at 56" o.c.
9 – 1	4 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 48" o.c.
	6	#4 at 56" o.c.	#4 at 40" o.c.	#4 at 32" o.c.
	7	#4 at 40" o.c.	#5 at 48" o.c.	#6 at 48" o.c.
	8	#4 at 32" o.c.	#6 at 48" o.c.	#4 at 16" o.c.
	9	#5 at 40" o.c.	#6 at 40" o.c.	#7 at 40" o.c.

a. For design lateral soil loads, see s. Comm 21.18 (1) (d). Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.

b. Provisions for this table are based on construction requirements specified in s. Comm 21.18 (3) (b).

c. For alternative reinforcement, see s. Comm 21.18 (3) (b).

d. Mortar shall be Type M or S and masonry shall be laid in running bond.

e. The specified location of the reinforcement shall equal or exceed the effective depth distance, d, measured from the face of the soil side of the wall to the center of vertical reinforcement.

TABLE 21.18-F [b,c,d]

12 IN. REINFORCED MASONRY FOUNDATION WALLS WHERE d ≥ 8.75 in.[e]

REINFORCED MASONRY				
		Vertical reinforcement		
Maximum Wall Height (ft - in)	Height of unbalanced backfill (ft)	Soil classes and lateral soil load[a] (psf per foot below natural grade)		
		GW, GP, SW and SP soils 30	GM, GC, SM, SM-SC and ML soils 45	SC, MH, ML-CL and inorganic CL soils 60
7 – 0	4 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
7 – 8	5	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6	#4 at 72" o.c.	#4 at 64" o.c.	#4 at 48" o.c.
	7	#4 at 72" o.c.	#4 at 48" o.c.	#5 at 56" o.c.
8 – 4	4 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6	#4 at 72" o.c.	#4 at 56" o.c.	#5 at 72" o.c.
	7	#4 at 64" o.c.	#5 at 64" o.c.	#4 at 32" o.c.
	8	#4 at 48" o.c.	#4 at 32" o.c.	#5 at 40" o.c.
9 – 1	4 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 64" o.c.
	6	#4 at 72" o.c.	#4 at 56" o.c.	#5 at 64" o.c.
	7	#4 at 56" o.c.	#4 at 40" o.c.	#6 at 64" o.c.
	8	#4 at 64" o.c.	#6 at 64" o.c.	#6 at 48" o.c.
	9	#5 at 56" o.c.	#7 at 72" o.c.	#6 at 40" o.c.

a. For design lateral soil loads, see s. Comm 21.18 (1) (d). Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.

b. Provisions for this table are based on construction requirements specified in s. Comm 21.18 (3) (b).

c. For alternative reinforcement, see s. Comm 21.18 (3) (b).

d. Mortar shall be Type M or S and masonry shall be laid in running bond.

e. The specified location of the reinforcement shall equal or exceed the effective depth distance, d, measured from the face of the soil side of the wall to the center of vertical reinforcement.

SECTION 71. Comm 21.22 (1m) and (4) are repealed and recreated to read:

Comm 21.22 (1m) FLOOR JOISTS ON MASONRY WALLS. (a) On masonry walls, the floor joists shall rest upon one of the following:

1. A mortar-filled or grout-filled core masonry block.

2. A solid top masonry block.

3. A sill plate at least as wide as the nominal width of the wall.

Note: See s. Comm 21.10 (4) for treatment requirements for wood in contact with masonry.

(4) BEARING AND END CONFIGURATION. (a) *Sawn lumber.* 1. 'Joists.' Wood joists made of sawn lumber shall meet the following bearing requirements:

a. Wood joists supported on wood or metal shall have a bearing surface of at least 1 1/2 inches measured from the end of the joist.

b. Wood joists supported on masonry or concrete shall have a bearing surface of at least 3 inches measured from the end of the joist.

c. The tail end of a floor joist may not extend past the edge of a beam by more than the depth of the floor joist.

d. Wood floor joists with ends that intersect over a beam shall have the ends overlap at least 3 inches and be securely fastened together with at least two 12d common nails or the ends shall be butt-jointed or face-jointed and fastened with ties, straps, plates or solid blocking.

2. 'Beams and girders.' Beams and girders made of sawn lumber shall have a bearing surface on their supports of at least 3 linear inches parallel to the beam or girder and be at least as wide as the beam or girder.

(b) *Engineered wood products.* Bearing surface for engineered wood products shall be in accordance with the manufacturer's instructions provided those instructions were developed through structural analysis or product testing and are applicable to the configuration.

SECTION 72. Comm 21.22 (5) (b) is repealed and recreated to read:

Comm 21.22 (5) (b) *Boring of floor joists.* 1. 'General.' A hole may not be bored in a floor joist within 2 inches of a notch.

2. 'Holes near the edge.' Holes bored in the top or bottom 2 inches of a joist shall follow the limitations for notching under par. (a).

3. 'Other holes.' Holes bored in floor joists that are not within 2 inches of the top or bottom of the joist shall have their diameter limited to 1/3 the depth of the joist.

SECTION 73. Comm 21.24 is repealed and recreated to read:

Comm 21.24 Exterior covering. (1) The exterior walls shall be covered with a permanent weather resistant finish.

(2) During construction, wall cavity insulation may not be installed until a water-resistant exterior covering is in place over the wall cavity.

Note: An example of acceptable water-resistant covering is foam sheathing with taped joints and the permanent doors and windows installed.

SECTION 74. Comm 21.25 (1) (title) is amended to read:

Comm 21.25 (1) (title) STUD ~~SIZE AND SPACING~~ CONFIGURATION AND BRACING.

SECTION 75. Comm 21.25 (1) (b) and (c) are repealed.

SECTION 76. Comm 21.25 (1) (d) is renumbered (b).

SECTION 77. Comm 21.25, Table 21.25-A (title) is repealed and recreated to read:

Comm 21.25, Table 21.25-A (title) MAXIMUM UNBRACED STUD LENGTH WITH SPACING AND LOADING

SECTION 78. Comm 21.25 (2) is repealed and recreated to read:

Comm 21.25 (2) TOP PLATES. (a) *General.* Except as allowed under subd. 3., top plates shall be provided and configured as follows:

1. Studs at bearing walls shall be capped with double top plates.

2. End joints in double top plates shall be offset at least 2 stud spaces.

3. Double top plates shall be overlapped at the corners and at intersections of partitions.

4. The plate immediately above a stud may have a joint only when directly over the stud.

(b) *Notching and boring.* 1. When piping or ductwork is placed in an exterior wall or an interior load bearing wall, such that at least half of the width of the top plate is removed, the plate shall be reinforced with a steel angle at least 2 inches by 2 inches by 20 gauge thick.

Note: 20 gauge is approximately 0.036 inch.

2. The steel angle shall span the gap and extend at least to the midpoint of the adjacent stud spaces.

3. Other equivalent materials may be used in accordance with s. Comm 21.02.

(c) *Exceptions.* 1. A single top plate may be used in place of a double top plate provided a rafter is located directly over the studs and the plate is securely tied at the end joints, corners and intersecting walls. Joints may occur in single top plates only when directly over a stud.

2. A continuous header, consisting of two 2-inch members set on edge, may be used in place of a double top plate provided the header is securely tied to the adjacent wall.

SECTION 79. Comm 21.25 (3) (b) 3. is amended to read:

Comm 21.25 (3) (b) 3. Headers greater than 6 feet in length shall be directly supported on each end by the single common stud and 2 shoulder studs. ~~Where 2 × 6 framing is used in bearing walls, the number of shoulder studs may be reduced to one.~~

SECTION 80. Comm 21.25 (6) is repealed and recreated to read:

Comm 21.25 (6) POSTS AND COLUMNS. (a) *General.* 1. Posts and columns shall be installed to resist imposed loads.

2. Posts and columns shall bear directly over the middle 1/3 of a footing.

3. Posts and columns shall be restrained at the top and bottom to resist displacement.

4. Posts and columns that use a height adjustment mechanism shall have the mechanism imbedded in concrete or permanently disabled after installation.

(b) *Bearing surface.* Posts and columns shall have a steel bearing plate affixed to one or both ends to distribute any applied loads and to prevent fiber crushing of any structural member being supported.

(c) *Steel posts or columns.* Steel posts or columns shall be sized according to one of the following methods:

1. Manufactured columns shall follow the manufacturer's testing and listing.

2. Columns made solely of steel pipe stock shall follow Table 21.25-E.

3. Columns made of steel stock, not meeting the requirements of subd. 3. a. or b., shall follow a nationally accepted design specification or the size shall be determined through structural analysis or load testing.

(d) *Wood posts or columns.* Wood posts or columns shall be sized according to Table 21.25-F or the size shall be determined through structural analysis or load testing.

SECTION 81. Comm 21.25, Tables 21.25-E and 21.25-F are repealed and recreated to read:

Table 21.25-E

COLUMNS MADE OF STEEL PIPE STOCK [1,2]

Column Diameter (inches)	Wall Thickness (inches)	Weight/ft (pounds)	Height (feet)	Allowable Load (pounds)
3	0.216	7.58	8	34,000
			10	28,000
			12	22,000
3.5	0.226	9.11	8	44,000
			10	38,000
			12	32,000
4	0.237	10.79	8	54,000
			10	49,000
			12	43,000
5	0.258	14.62	8	78,000
			10	73,000
			12	68,000
6	0.280	18.97	8	106,000
			10	101,000
			12	95,000

Note 1: This Table is based on a yield strength or Fy of 36,000 psi.

Note 2: This table is for columns made solely of steel pipe stock. The addition of any adjustment mechanism or other feature will alter the load carrying capacity of the column.

Table 21.25-F

WOOD COLUMNS

Wood Nominal Size (inches)	Cross Section Area (inches)	Height (feet)	Allowable Load (pounds)
4 x 4	12.25	8	4,900
		10	3,100
		12	2,150
4 x 6	19.25	8	7,700
		10	4,900
		12	3,400
6 x 6	30.25	8	30,000
		10	18,900
		12	13,300

Note: This Table is based on a modulus of elasticity or E of 1,000,000 psi and a fiber bending strength or F_b of 1,000 psi.

SECTION 82. Comm 21.27 (3) (a) 1. a. is amended to read:

Comm 21.27 (3) (a) 1. a. Underlayment consisting of number 15 asphalt-impregnated felt paper or equivalent or other type I material ~~conforming to~~ that shows no water transmission when tested in accordance with ASTM D 226 or ASTM D 4869 shall be provided under shingles.

SECTION 83. Comm 21.29 (6) and (9) are repealed and recreated to read:

Comm 21.29 (6) HEARTH EXTENSION. (a) Masonry fireplaces shall have a hearth extension made of noncombustible material.

(b) The structural support for the hearth and hearth extension shall be a minimum of 4 inches of reinforced concrete.

(c) There shall be no structural framing material within 1 inch of the hearth or hearth extension in any direction. Any wooden forms or supports used during construction shall be removed.

(d) The minimum dimensions of the hearth extension shall be in accordance with Table 21.29-1.

(9) FLUE LINERS. (a) Flue liners shall be installed in accordance with s. Comm 21.30 (7) and this section.

(b) Flue liners shall start at the top of the fireplace throat and extend to a point at least 4 inches above the top of the chimney cap.

(c) Firebrick may be used in the throat of the fireplace as an inlet to the flue liner.

SECTION 84. Comm 21.30 (7) (a) is repealed and recreated to read:

Comm 21.30 (7) (a) Masonry chimneys shall be lined with a material that will resist corrosion, softening and cracking at temperatures up to 1800°F, such as vitrified clay sewer pipe or minimum 5/8 inch thick fireclay lining material.

SECTION 85. Comm 21.30 (7) (d) and (e) are created to read:

Comm 21.30 (7) (d) There shall be a minimum clearance of 1/2-inch between the flue liner and the chimney walls.

(e) Unless serving a masonry fireplace under s. Comm 21.29, flue liners shall commence at the chimney footing.

SECTION 86. Comm 21.30 (9) (c) is amended to read:

Comm 21.30 (9) (c) The clearance spaces between chimneys and wood joists, beams, headers or other structural members ~~which form floors or ceilings~~ shall be ~~firestopped~~ fireblocked at each floor level from chimney footing all the way to the roof flashing with galvanized steel, at least 26 gage thick or with noncombustible sheet material ~~not more than 1/2 inch thick~~.

SECTION 87. Comm 22.04 is created to read:

Comm 22.04 Protection of insulation. (1) BLANKET INSULATION. Except in the box sill, insulating blankets or batts shall be held in place with a covering or other means of mechanical or adhesive fastening.

Note: Acceptable covering or fastening for interior or warm-side applications includes drywall, vapor retarder material, foil or kraft paper backing or other means of holding the blankets in place. Air barrier material may be used for cold-side support.

(2) FOAM PLASTIC INSULATION. Exterior foam plastic insulation shall be protected from physical damage and damage from ultraviolet light.

Note: For interior applications, a thermal barrier may be required under s. Comm 21.11.

SECTION 88. Comm 22.06 (5) and (15) are amended to read:

Comm 22.06 (5) "Conditioned space" means space within the dwelling envelope which is provided with heated or cooled air or surfaces to provide a heated space or a cooled space.

(15) "Gross exterior wall area " means the normal projection of the dwelling envelope wall area bounding interior space which is conditioned by an energy-using system including opaque wall, window and door area. The gross area of exterior walls consists of all opaque wall areas, including between floor spandrels, ~~peripheral edges of floors,~~ box sills, window area including sash, and door areas when they are exposed to outdoor air or unconditioned spaces and enclosed heated or mechanically cooled space, including interstitial area between two such spaces. The gross exterior wall area includes the total basement wall area if it is less than 50 percent below grade. The gross exterior wall area includes non-opaque areas such as windows and doors of all basement walls.

SECTION 89. Comm 22.06 (19) Note is repealed.

SECTION 90. Comm 22.07, Table 22.07-1 is amended to read:

TABLE 22.07-1
INDOOR DESIGN TEMPERATURES

SEASON	LOCATION	DESIGN TEMPERATURE
Winter	All areas except nonhabitable basement areas	70°F
	Unheated, nonhabitable basement areas only	~~45~~ Less Than 50°F
Summer	All areas	78°F

[NOTE TO REVISOR: Please delete one of the two "Zone 1" lines in Table 22.07-2.]

SECTION 91. Comm 22.08 (1) (d) is created to read:

Comm 22.08 (1) (d) The ventilation area required in par. (a) shall be maintained after the installation of insulation.

SECTION 92. Comm 22.12 (3) is created to read:

Comm 22.12 (3) The efficiency of equipment installed in a dwelling shall match the efficiency used to claim any credit under the method of design by system analysis or other approved compliance method.

SECTION 93. Comm 22.17 (1) is amended to read:

Comm 22.17 (1) Except as provided in sub. (4), all heating and cooling duct systems, or portions thereof, that are located ~~on the exterior of walls, floors, ceilings or roofs that are part of the thermal envelope~~ in unheated or uncooled spaces respectively, shall be provided with insulation with a thermal resistance of at least R-5.

SECTION 94. Comm 22.18 is created to read:

Comm 22.18 Duct and plenum sealing. (1) Sections of supply and return ducts not located entirely within the conditioned space and the unconditioned side of enclosed stud bays or joist cavities or spaces used to transport air shall be sealed.

(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 has a rubber-based adhesive and does not comply with the requirements under this section.

SECTION 95. Comm 22.20 Note is repealed and recreated to read:

Comm 22.20 **Note:** See appendix for a copy of the UDC Energy Worksheet used to show compliance with the envelope insulation requirements of ss. Comm 22.21 to 22.28. Copies of the worksheets may be obtained from the Department of Commerce, Safety & Buildings Division, P.O. Box 2509, Madison, WI 53701. Other forms or software may be used when approved by the department. WIScheck software may be used to show compliance and is

available from the Safety & Buildings page on the Department of Commerce Website www.commerce.state.wi.us

SECTION 96. Comm 22.25 is amended to read:

Comm 22.25 Floors over unheated spaces. The combined thermal transmittance value U_o of the gross area of floors that are over unheated spaces and of floors over outdoor air, such as overhangs, ~~and~~ shall not exceed the values given in Table 22.21. Equation 3 in s. Comm 22.31 (1) shall be used to determine acceptable combinations to meet this requirement.

SECTION 97. Comm 22.27 (2) is repealed and recreated to read:

Comm 22.27 (2) (a) The vertical wall insulation shall extend from the top of the wall to at least the inside ground surface.

(b) Where the vertical wall insulation stops less than 12 inches below the outside finish ground level, crawl space wall insulation shall extend horizontally and vertically downward a minimum total distance of 24-inches linearly from the outside finish ground level.

SECTION 98. Comm 22.28 (2) is repealed and recreated to read:

Comm 22.28 (2) (a) Except as provided in par. (b), the insulation shall extend to the level of the basement floor.

(b) Changes in the exterior insulation area and basement wall minimum thermal transmittance may be included as part of a trade-off allowed under the method of design by system analysis or other approved compliance method.

(c) If interior insulation is used for code compliance, it shall extend the full height of the wall from basement floor to the underside of the joists above unless tradeoffs are justified by supporting calculations that consider lateral heat conduction in the wall.

SECTION 99. Comm 22.31 (5) is repealed and recreated to read:

Comm 22.31 (5) VALUES. Unless otherwise specified in this chapter, the thermal transmittance and resistance values used in heat gain and loss calculations shall be determined by one of the following methods:

(a) The values shall be those given in the ASHRAE Handbook of Fundamentals as adopted under s. Comm 20.24 (5).

Note: See the appendix under "Typical Thermal Properties of Building Materials" for the ASHRAE values.

(b) 1. Testing to a nationally-recognized test standard by an independent third party that is submitted for department review and approval under s. Comm 20.18.

2. The testing shall verify the claimed thermal resistance for the specific application of the product or assembly.

3. For foam plastic insulation that uses a blowing agent other than air, the independent third party tests shall use samples that have been aged for the equivalent of 5 years or until the R-value has stabilized.

SECTION 100. Comm 22.33 Note is repealed and recreated to read:

Comm 22.33 **Note:** The department recognizes the use of tradeoffs between higher efficiency furnaces and lower insulation levels. See appendix for an example of the UDC Energy Worksheet. Copies of the worksheet may be obtained from the Department of Commerce, Safety & Buildings Division, P.O. Box 2509, Madison, WI 53701. Other forms or software may be used when approved by the department. WIScheck software may be used to show compliance and is available from the Safety & Buildings page on the Department of Commerce Website www.commerce.state.wi.us

SECTION 101. Comm 23.02 (3) (a) is repealed and recreated to read:

Comm 23.02 (3) VENTILATION. (a) *General.* All exhaust vents shall terminate outside the structure.

SECTION 102. Comm 23.02 (3) (b) and (c) are renumbered Comm 23.02 (3) (c) and (d).

SECTION 103. Comm 23.02 (3) (b) is created to read:

Comm 23.02 (3) (b) *Balancing.* 1. 'General.' Except as provided under subd. 2., mechanical ventilation systems shall be balanced.

2. 'Exception.' Passive intake air ducts providing makeup air for intermittent exhaust fans shall be sized to provide at least 40% of the total air that would be exhausted with all intermittent exhaust ventilation in the dwelling operating simultaneously.

3. 'Kitchen range hoods.' a. Kitchen range hoods that exhaust air from the kitchen area are considered as exhaust ventilation for balancing and makeup purposes.

b. Kitchen range hoods that are listed and installed to recirculate air without exhausting it are not required to be balanced.

4. 'Infiltration.' a. Infiltration may be considered as makeup air for balancing purposes only where there are no naturally vented space- or water-heating appliances in the dwelling.

b. For the purpose of complying with this subdivision, naturally vented space- or water-heating appliances are those that take combustion or dilution air from inside the dwelling, including unsealed fireplaces and draft hood appliances with power venting.

Note: Whole-house fans that are used in the summer to bring cool night air in through open windows and exhaust into the attic are considered to be a supplemental cooling system rather than part of the ventilation system.

Note: See s. Comm 22.14 for additional requirements on mechanical ventilation.

SECTION 104. Comm 23.04 (title) is amended to read:

Comm 23.04 (title) **Types and location of equipment.**

SECTION 105. Comm 23.04 (1) (e) is repealed.

SECTION 106. Comm 23.04 (4) is created to read:

Comm 23.04 (4) LOCATION. (a) *Enclosed spaces.* Except as provided in par. (c), no space heating or water heating appliance shall be installed in a bedroom bathroom, closet, or garage unless listed for such installation.

(b) *Garages.* Appliances installed in garages shall have burners and burner ignition devices located at least 18 inches above the floor and shall be protected or located so the furnace is not subject to damage from a vehicle.

(c) *Exceptions.* 1. Vented decorative gas appliances and decorative gas appliances for installation in vented fireplaces may be installed in bedrooms or bathrooms only when both of the following conditions are met:

a. The volume of the space in which the appliance is located is not less than 50 cubic feet per 1000 Btu/h of the combined input rating of all fuel burning appliances installed in that space. The space may be made up of more than one room if the rooms are connected through doorway openings without doors.

b. The vapor retarder is not continuous on walls and ceilings exposed to the outside atmosphere as allowed under s. Comm 22.22.

2. Water heaters may be installed in a closet located in a bathroom or bedroom where the closet is used exclusively for the water heater, where the enclosed space has a weather-stripped solid door with a self-closing device, and where all air for combustion is obtained from the outdoors.

Note: Section Comm 23.06 still requires combustion air to be provided to the appliance.

SECTION 107. Comm 23.045 (2) (b) is repealed.

SECTION 108. Comm 23.045 (2) (c) is renumbered (2) (b) and amended to read:

Comm 23.045 (2) (b) Garages. Solid-fuel-burning-appliances ~~shall~~ may not be installed in a garage ~~unless listed for such use~~.

SECTION 109. Comm 23.045 (3) (a) 1. Note is created to read:

Comm 23.045 (3) (a) 1. **Note:** Products listed and labeled as complying with UL 103 - "Type HT" meet this requirement. UL 103 uses several temperature ranges for different products but only the "Type HT"-designated products have met the 2100°F testing requirement.

SECTION 110. Comm 23.06 is repealed and recreated to read:

Comm 23.06 Combustion air. (1) SCOPE. (a) Naturally vented appliances and other appliances that require air for combustion and dilution of flue gases to be taken from within the building shall comply with this section.

(b) Appliances that are provided with a direct supply of outside air for combustion in accordance with the manufacturer's installation instructions and listing are not required to comply with this section.

(c) Where the appliance listing and manufacturer's instructions are more stringent than the provisions of this section, the listing and manufacturer's instructions apply.

(2) METHODS FOR PROVIDING AIR. Air for combustion and dilution shall be provided in accordance with one of the following:

(a) If the vapor retarder is not continuous on walls and ceilings exposed to the outside atmosphere as allowed by s. Comm 22.22, air may be provided from inside the building in accordance with sub. (3).

(b) Air may be provided from outside the building in accordance with sub. (4).

(c) The appliance may be installed in accordance with its listing and manufacturer's instructions. Where all walls and ceilings exposed to the outside atmosphere are provided with a continuous vapor retarder, any requirements for unusually tight construction shall be met.

(d) An engineered system providing an adequate supply of air for combustion ventilation and dilution of flue gases may be installed if approved by the department.

(3) AIR FROM INSIDE THE BUILDING. (a) 1. The equipment shall be located in a space with a volume not less than 50 cubic feet per 1000 Btu/h of the combined input rating of all fuel burning appliances drawing combustion and dilution air from that space.

2. The space may be made up of more than one room if the rooms are connected through doorways without doors or connected through sets of openings described in par. (b).

(b) 1. When needed to connect rooms, two openings shall be provided, one within 1 foot of the ceiling of the room and one within one foot of the floor.

2. The net free area of openings shall be calculated in accordance with sub. (5).

3. The net free area of each opening shall be a minimum of one square inch per 1000 Btu/h of combined input rating of the fuel burning appliances drawing combustion and dilution air from the communicating rooms, but shall be not less than 100 square inches.

(4) AIR FROM OUTSIDE THE BUILDING. (a) When air for combustion and dilution is provided from outside the building, as allowed under sub. (2) (b), one of the methods specified in pars. (b) to (d) shall be used.

(b) Openings may be provided to connect rooms containing appliances to the outdoors.

1. a. Two openings shall be provided, one within one foot of the ceiling of the room and one within one foot of the floor.

b. Openings may connect directly to the outdoors or to the outdoors through a horizontal or vertical duct.

c. The net free area of openings shall be calculated in accordance with sub. (5).

2. The net free area of each direct opening to the outdoors not using a duct shall be a minimum of one square inch per 4000 Btu/h of combined input rating of the fuel burning appliances drawing combustion and dilution air from the room.

3. a. The net free area of each opening connected to the outdoors through a horizontal duct shall be a minimum of one square inch per 2000 Btu/h of combined input rating of the fuel burning appliances drawing combustion and dilution air from the room.

b. The cross sectional area of the duct shall be equal to or greater than the required size of the opening.

4. a. The net free area of each opening connected to the outdoors through a vertical duct shall be a minimum of one square inch per 4000 Btu/h of combined input rating of the fuel burning appliances drawing combustion and dilution air from the room.

b. The cross sectional area of the duct shall be equal to or greater than the required size of the opening.

(c) 1. Where all appliances drawing air for combustion and dilution from the room are gas appliances, air may be provided via a single opening to connect the room to the outdoors in accordance with this paragraph.

2. a. The opening shall be located within 1 foot of the ceiling of the room.

b. The opening may connect directly to the outdoors, may connect to the outdoors through a horizontal duct, or may connect to the outdoors through a vertical duct.

c. The net free area of openings shall be calculated in accordance with sub. (5).

3. a. The net free area of the opening shall be a minimum of one square inch per 3000 Btu/h of combined input rating of the fuel burning appliances drawing combustion and dilution air from the room, and not less than the combined cross sectional flow areas of the appliance flue collars or draft hood outlets.

b. The cross sectional area of the duct shall be equal to or greater than the required size of the opening.

4. The appliances shall have a minimum clearance to the surfaces of the room of one inch at the sides and back of the appliance and 6 inches at the front of the appliance.

(d) 1. A combination of openings to the outside and openings to other rooms may be used in accordance with this paragraph.

2. a. One opening shall connect directly to the outdoors, connect to the outdoors through a horizontal duct, or connect to the outdoors through a vertical duct.

b. The net free area of the opening shall be calculated in accordance with sub. (5).

c. The net free area of the opening shall be a minimum of one square inch per 5000 Btu/h of combined input rating of the fuel burning appliances drawing combustion and dilution air from the room.

d. The cross sectional area of a duct, if used, shall be equal to or greater than the required size of the opening.

3. a. The equipment shall be located in a space with a volume not less than 50 cubic feet per 1000 Btu/h of the combined input rating of all fuel burning appliances installed in that space.

b. The space may be made up of more than one room if the rooms are connected through openings without doors or connected through sets of openings described in subd. 3.

4. a. When needed to connect rooms, two openings shall be provided, one within 1 foot of the ceiling of the room and one within one foot of the floor.

b. The net free area of openings shall be calculated in accordance with sub. (5).

c. The net free area of each opening shall be a minimum of one square inch per 1000 Btu/h of combined input rating of the fuel burning appliances drawing combustion and dilution air from the communicating rooms, but shall be not less than 100 square inches.

(5) NET FREE AREA CALCULATION. (a) The required size of openings for combustion and dilution air shall be based on the net free area of each opening.

(b) The net free area of an opening shall be that specified by the manufacturer of the opening covering or by a source approved by the department.

(c) In the absence of such information, openings covered with metal louvers shall be deemed to have a net free area of 75 percent of the area of the opening, and openings covered with wood louvers shall be deemed to have a net free area of 25 percent of the area of the opening.

(6) INTERLOCKING OF DAMPERS. (a) Where the combustion air openings are provided with volume, smoke or fire dampers, the dampers shall be electronically interlocked with the firing cycle of the appliances served, so as to prevent operation of any appliance that draws combustion and dilution air from the room when any of the dampers are closed.

(b) Manually operated dampers shall not be installed in combustion air openings.

(7) SIMULTANEOUS OPERATION. (a) The equipment and appliances within every room containing fuel-burning appliances shall be installed so as to allow the free circulation of air.

(b) Provisions shall be made to allow for the simultaneous operation of mechanical exhaust systems, fireplaces, clothes dryers or other equipment and appliances operating in the same room or space from which combustion air and dilution air is being drawn. The provisions shall prevent the operation of the appliances, equipment and systems from affecting the supply of combustion and dilution air.

Note: Wood typically has a heating value of 8600 BTU per pound.

SECTION 111. Comm 23.062 is created to read:

Comm 23.062 Mechanical draft systems. Where a mechanical draft system, such as a fan is used, provision shall be made to prevent the flow of gas to the main burners when the draft system is not performing so as to satisfy the operating requirements of the system for safe performance.

SECTION 112. Comm 23.14 (3) is created to read:

Comm 23.14 (3) VENTING SYSTEM LOCATION. (a) A venting system shall terminate at least 3 feet above any forced air inlet located within 10 feet horizontally. This provision does not apply to the combustion air intake of a direct-vent appliance.

(b) The venting system of other than a direct-vent appliance shall terminate at least 4 feet below, 4 feet horizontally from, or one foot above any door , window, or gravity air inlet into any building. The bottom of the vent shall be located at least 12 inches above grade.

(c) The vent terminal of a direct-vent appliance with an input of 10,000 Btu per hour or less shall be located at least 6 inches from any air opening into a building.

(d) The vent terminal of a direct-vent appliance with an input over 10,000 Btu per hour but not over 50,000 Btu per hour shall be located at least 9 inches from any air opening into a building.

(e) The vent terminal of a direct-vent appliance with an input over 50,000 Btu per hour shall be shall be located at least 12 inches from any air opening into a building.

(f) The bottom of the vent terminal and the air intake of a direct-vent appliance shall be located at least 12 inches above grade.

(g) The exit terminal of a mechanical draft system shall be not less than 7 feet above grade where located within 3 feet of a public walkway that is intended for use by the general public.

[Note to Revisor Please correct the following typographical errors:
1. Comm 21.05 (5) (a); change the second "in" to "is".
2. Comm 21.08 (3) (a); remove the "and" at the end of the paragraph.
3. Comm 21.08 (5) (intro.); remove the "3/4" at the end.]

END

Pursuant to s. 227.22 (2) (b), Stats., these rules shall take effect on April 1, 2001.

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January 4, 2001

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Dear Messrs. Poulson and LaFollette:

TRANSMITTAL OF RULE ADOPTION

CLEARINGHOUSE RULE NO.: 00-073

RULE NO.: Chs. Comm 20-25

RELATING TO: Uniform (1-2 Family) Dwelling Code

Pursuant to section 227.20, Stats., agencies are required to file a certified copy of every rule adopted by the agency with the offices of the Secretary of State and the Revisor of Statutes.

At this time, the following material is being submitted to you:

1. Order of Adoption.
2. Rules Certificate Form.
3. Rules in Final Draft Form.

Pursuant to section 227.114, Stats., a summary of the final regulatory flexibility analysis is also included.

Respectfully submitted,

Brenda J. Blanchard
Secretary