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Ind 51

STATE OF WISCONSIN)
)
DEPT. OF INDUSTRY, LABOR AND HUMAN RELATIONS) SS.

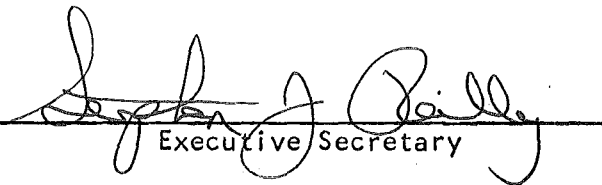
TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Stephen J. Reilly, Secretary of the State of Wisconsin, Department of Industry, Labor and Human Relations, and custodian of the official records of said department, do hereby certify that the attached rules, renumbering and repeals to the Building and Heating, Ventilating and Air Conditioning Code were adopted by the Department of Industry, Labor and Human Relations on August 4, 1967.

I further certify that said copy has been compared by me with the original on file in this 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 and affixed the official seal of the department at the Capitol, in the City of Madison, this 4th

day of August, A. D., 1967.


Executive Secretary

ORDER OF THE DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS

Pursuant to authority vested in the Department of Industry, Labor and Human Relations by section 101.01 and 101.29 Wis. Stats., the Department of Industry, Labor and Human Relations hereby repeals, recreates, and adopts rules as follows:

(See Next Page)

(2)(c)

(2)(c)

✓ Ind 51.08 Repeal and recreate Ind 51.08 to read:

(c) An ordinary occupancy separation shall be of not less than one-hour fire-resistive construction as specified in sections Ind 51.05 and Ind 51.06. All openings in such separations shall be protected by self-closing fire-resistive doors as specified in section Ind 51.09 and such doors shall be kept normally closed.

✓ Ind 51.15 Repeal and recreate Ind 51.15 to read:

Standard exit. (1) Every door which serves as a required exit from a public passageway, stairway or building shall be a standard exit door unless exempted by the occupancy requirements of this code.

NOTE: For required exits see Wis. Adm. Code sections Ind 54.06, 55.10, 56.08 and 57.09.

(2) Every standard exit door shall swing outward or toward the natural means of egress (except as below). It shall be level with the floor, and shall be so hung that, when open, it will not block any part of the required width of any other doorway, passageway, stairway or fire escape. No revolving door, and no sliding door except where it opens onto a stairway enclosure or serves as a horizontal exit, shall be considered as a standard exit door.

(3) A standard exit door shall have such fastenings or hardware that it can be opened from the inside without using a key, by pushing against a single bar or plate, or turning a single knob or handle. It shall not be barred or bolted at any time while the building is occupied.

(4) A standard exit doorway shall not be less than 6 feet 4 inches high by 3 feet 4 inches wide, except where especially provided under occupancy classifications and in Wis. Adm. Code section Ind 51.20. Where double doors are provided with or without mullions, the width of each single door may be reduced to 2 feet 6 inches.

(5) All exit doors, unless otherwise exempted by the occupancy requirements of

this code, shall be plainly marked by a red illuminated translucent exit sign bearing the word EXIT or OUT in plain letters not less than 5 inches in height and in such other places as may be necessary to direct the occupants to exit doorways.

(6) Doors, windows or other openings which are not exits but which give the appearance of exits shall be effectively guarded.

(a) Glass Doors. All glass doors shall be provided with a push bar or plate inside and outside. The push bar or plate shall be within 32 inches to 44 inches above the floor.

(b) Glass Wall Panels having a curb or sill less than 24 inches in height shall be protected by a horizontal bar or rail at least 1-1/2 inches wide and located within 3 feet 6 inches to 4 feet 6 inches above the floor. The bar or rail assembly shall be capable of withstanding a lateral force of 100 pounds applied at any point.

(7) Safeguards for physically handicapped persons:

(a) Every public building, the construction of which is commenced after January 1, 1964, shall be so designed and constructed to provide a reasonable means of ingress and egress for physically handicapped persons with the exception of those listed in subsection (j).

(b) There shall be at least one grade or street level entrance without steps. The door shall be at least 6 feet 4 inches high and not less than 3 feet 4 inches wide and shall comply with all other requirements of this section.

(c) Where the door sill or floor is above or below grade or street level, the difference in elevation shall be accomplished by a ramp with a slope of not more than one foot of rise in 12 feet, and shall be finished with a nonslippery surface.

(d) Other grade or street level entrances not so designed or constructed shall be marked with a sign indicating the location of the entrance or exit available for wheelchair service.

(e) The ramp shall be at least 3 feet 8 inches in width of which not more than 4 inches on each side may be occupied by a handrail.

(f) All ramps shall have a handrail on each side. Handrail shall be not less than 2 feet 6 inches in height with an intermediate rail at mid-height.

(g) The floor on the inside and outside of each ramp doorway shall be level for a distance of 6 feet from the door.

(h) Every ramp shall have at least 6 feet of level clearance at the bottom.

(i) All ramps shall have a level platform at 30-ft. intervals and shall have a level platform at least 6 feet in length wherever they turn.

(j) Exceptions:

1. Apartment buildings with less than 20 living units.

2. Row houses.

3. Convents and monasteries.

4. Jails and other places of detention.

5. Garages, service stations, hangars, boathouses, and other buildings in the hazardous occupancy classification.

6. Factories and mercantile buildings.

✓ Create Ind 51.25 to read:

Ind 51.25 SPECIFICATIONS CITED IN THIS CODE. The specifications of the American Society for Testing and Materials referred to in this code are listed below.

(1) CLAY BUILDING BRICK. (Solid masonry units made from clay or shale)

Part 12 ASTM Designation C 62-66.

✓(2) SAND-LIME BUILDING BRICK. Part 12 ASTM Designation C 73-51 (1965).

(3) CONCRETE BUILDING BRICK. Part 12 ASTM Designation C 55-66T.

(4) SAMPLING AND TESTING BRICK. Part 12 ASTM Designation C 67-66.

(5) STRUCTURAL CLAY LOAD-BEARING WALL TILE. Part 12 ASTM C 34-62.

(6) SAMPLING AND TESTING STRUCTURAL CLAY TILE. Part 12 ASTM C 112-60.

(7) SAMPLING AND TESTING CONCRETE MASONRY UNITS. Part 12 C 140-65T.

(8) STRUCTURAL CLAY NON-LOAD-BEARING TILE. Part 12 ASTM Designation C 56-62.

- (9) STRUCTURAL CLAY FLOOR TILE. Part 12 ASTM Designation C 57-57 (1965).
- (10) PORTLAND CEMENT. Part 10 ASTM Designation C 150-66.
- (11) AIR-ENTRAINING PORTLAND CEMENT. Part 10 ASTM Designation C 175-66.
- (12) PORTLAND BLAST-FURNACE SLAG CEMENT. Part 10 Designation C 205-64T.
- (13) MASONRY CEMENT. Part 9 ASTM Designation C 91-66.
- (14) QUICKLIME FOR STRUCTURAL PURPOSES. Part 9 ASTM Designation C 5-59.
- (15) HYDRATED LIME FOR MASONRY PURPOSES. Part 9 ASTM Designation C 207-49 (1961).
- (16) AGGREGATE FOR MASONRY MORTAR. Part 10 ASTM Designation C 144-66T.
- (17) AGGREGATES FOR MASONRY GROUT. Part 10 ASTM Designation C 404-61.
- (18) PORTLAND-POZZOLAN CEMENT. Part 9 ASTM Designation C 340-66T.
- (19) CONCRETE AGGREGATES. Part 10 ASTM Designation C 33-66.
- (20) LIGHTWEIGHT AGGREGATES FOR STRUCTURAL CONCRETE. Part 10 ASTM Designation C 330-64T.
- (21) BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT. Part 4 ASTM Designation A15-66.
- (22) RAIL-STEEL BARS FOR CONCRETE REINFORCEMENT. Part 4 ASTM Designation A 16-66.
- (23) DEFORMED RAIL STEEL BARS FOR CONCRETE REINFORCEMENT WITH 60,000 P.S.I. MINIMUM YIELD STRENGTH. Part 4 ASTM Designation A 61-66.
- (24) AXLE-STEEL BARS FOR CONCRETE REINFORCEMENT. Part 4 ASTM Designation A 160-66.
- (25) SPECIAL LARGE SIZE DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT. Part 4 ASTM Designation A 408-66.
- (26) HIGH-STRENGTH DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT WITH 75,000 P.S.I. MINIMUM YIELD STRENGTH. Part 4 ASTM Designation A 431-66.
- (27) MINIMUM REQUIREMENTS FOR THE DEFORMATIONS OF DEFORMED STEEL BARS FOR CONCRETE REINFORCEMENT. Part 4 ASTM Designation A 305-65.
- (28) BLEEDING OF CONCRETE. Part 10 ASTM Designation C 232-58 (1966).
- (29) FABRICATED STEEL BAR OR ROD MATS FOR CONCRETE REINFORCEMENT. Part 4 ASTM Designation A 184-65.

- (30) COLD-DRAWN STEEL WIRE FOR CONCRETE REINFORCEMENT. Part 4 ASTM Designation A 82-66.
- (31) WELDED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT. Part 4 ASTM Designation A 185-64.
- (32) UNCOATED SEVEN-WIRE STRESS-RELIEVED STRAND FOR PRESTRESSED CONCRETE. Part 4 ASTM Designation A 416-64.
- (33) UNCOATED STRESS-RELIEVED WIRE FOR PRESTRESSED CONCRETE. Part 4 ASTM Designation A 421-65.
- (34) STEEL FOR BRIDGES AND BUILDINGS. Part 4 ASTM Designation A 7-66.
- (35) STRUCTURAL STEEL. Part 4 ASTM Designation A 36-66.
- (36) FLEXURAL STRENGTH OF CONCRETE (using simple beam with third-point loading). Part 10 ASTM Designation C 78-64.
- (37) WELDED AND SEAMLESS STEEL PIPE. Part 1 ASTM Designation A 53-65.
- (38) CAST IRON AND DUCTILE IRON PRESSURE PIPE. Part 2 ASTM Designation A 377-66.
- (39) AIR-ENTRAINING ADMIXTURES FOR CONCRETE. Part 10 ASTM Designation C 260-66T.
- (40) CHEMICAL ADMIXTURES FOR CONCRETE. Part 10 ASTM Designation C 494-65T.
- (41) FLY ASH FOR USE AS AN ADMIXTURE IN PORTLAND CEMENT CONCRETE. Part 10 ASTM Designation C 350-65T.
- (42) RAW OR CALCINED NATURAL POZZOLANS FOR USE AS ADMIXTURES IN PORTLAND CEMENT CONCRETE. Part 10 ASTM Designation C 402-65T.
- (43) METHODS AND DEFINITIONS FOR MECHANICAL TESTING OF STEEL PRODUCTS. Part 4 ASTM Designation A 370-65.
- (44) DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT WITH 60,000 P.S.I. MINIMUM YIELD STRENGTH. Part 4 ASTM Designation A 432-66.
- (45) MAKING AND CURING CONCRETE COMPRESSION AND FLEXURE TEST SPECIMENS IN THE FIELD. Part 10 ASTM Designation C 31-66.
- (46) COMPRESSIVE STRENGTH OF MOLDED CONCRETE CYLINDERS. Part 10 ASTM Designation C 39-66.

- (47) OBTAINING AND TESTING DRILLED CORES AND SAWED BEAMS OF CONCRETE. Part 10 ASTM Designation C 42-64.
- (48) READY-MIXED CONCRETE Part 10 ASTM Designation C 94-65.
- (49) SAMPLING FRESH CONCRETE. Part 10 ASTM Designation C 172-54.
- (50) MAKING AND CURING CONCRETE COMPRESSION AND FLEXURE TEST SPECIMENS IN THE LABORATORY. Part 10 ASTM Designation C 192-66.
- (51) SPLITTING TENSILE STRENGTH OF MOLDED CONCRETE CYLINDERS. Part 10 ASTM Designation C 496-66.
- (52) METHODS OF MECHANICAL TESTINGS. Part 31 ASTM Designation E 6-66.
- (53) MILD STEEL COVERED ARC-WELDING ELECTRODES. Part 4 ASTM Designation A 233-64T.
- (54) RECOMMENDED PRACTICE FOR PROBABILITY SAMPLING OF MATERIALS. Part 30 ASTM Designation E 105-58.
- (55) CALCIUM CHLORIDE. Part 10 ASTM Designation D 98-59.
- (56) CHEMICAL ANALYSIS OF HYDRAULIC CEMENT. Part 9 ASTM Designation C 114-67.
- (57) FINENESS OF PORTLAND CEMENT BY THE TURBIDIMETER. Part 9 ASTM Designation C 115-58.
- (58) FINENESS OF PORTLAND CEMENT BY AIR PERMEABILITY APPARATUS. Part 9 ASTM Designation C 204-55.
- (59) COMPRESSIVE STRENGTH OF HYDRAULIC CEMENT MORTARS (using 2-in. cube specimens). Part 9 ASTM Designation C 109-64.
- (60) AUTOCLAVE EXPANSION OF PORTLAND CEMENT. Part 9 ASTM Designation C 151-66.
- (61) SPECIFIC GRAVITY OF HYDRAULIC CEMENT. Part 9 ASTM Designation C 188-44 (1958).
- (62) RESISTANCE TO ABRASION OF SMALL SIZE COARSE AGGREGATE BY USE OF THE LOS ANGELES MACHINE. Part 10 ASTM Designation C 131-66.
- (63) MATERIALS FINER THAN NO. 200 SIEVE IN MINERAL AGGREGATES BY WASHING. Part 10 ASTM Designation C 117-66.
- (64) FRIABLE PARTICLES IN AGGREGATES. Part 10 ASTM Designation C 142-66T.

- (65) LIGHTWEIGHT PIECES IN AGGREGATES. Part 10 ASTM Designation C 123-66.
- (66) ORGANIC IMPURITIES IN SANDS FOR CONCRETE. Part 10 ASTM Designation C 40-66.
- (67) SIEVE OR SCREEN ANALYSIS OF FINE AND COARSE AGGREGATES. Part 10 ASTM Designation C 136-63.
- (68) SOUNDNESS OF AGGREGATES BY USE OF SODIUM SULFATE OR MAGNESIUM SULFATE. Part 10 ASTM Designation C 88-63.
- (69) SPECIFIC GRAVITY AND ABSORPTION OF COARSE AGGREGATE. Part 10 ASTM Designation C 127-59.
- (70) SPECIFIC GRAVITY AND ABSORPTION OF FINE AGGREGATE. Part 10 ASTM Designation C 128-59.
- (71) SURFACE MOISTURE IN FINE AGGREGATE. Part 10 ASTM Designation C 70-66.
- (72) UNIT WEIGHT OF AGGREGATE. Part 10 ASTM Designation C 29-60.
- (73) VOIDS IN AGGREGATE FOR CONCRETE. Part 10 ASTM Designation C 30-37 (1964).
- (74) EFFECT OF ORGANIC IMPURITIES IN FINE AGGREGATE ON STRENGTH OF MORTAR. Part 10 ASTM Designation C 87-63T.
- (75) PETROGRAPHIC EXAMINATION OF AGGREGATES FOR CONCRETE. Part 10 ASTM Designation C 295-65.
- (76) POTENTIAL REACTIVITY OF AGGREGATES (CHEMICAL METHOD). Part 10 ASTM Designation C 289-66.
- (77) POTENTIAL ALKALI REACTIVITY OF CEMENT-AGGREGATE COMBINATIONS (MORTAR BAR METHOD). Part 10 ASTM Designation C 227-65.
- (78) TERMS RELATING TO CONCRETE AND CONCRETE AGGREGATES. Part 10 ASTM Designation C 125-66.
- (79) WEIGHT PER CUBIC FOOT, YIELD, AND AIR CONTENT (GRAVIMETRIC) OF CONCRETE. Part 10 ASTM Designation C 138-63.
- (80) AIR CONTENT OF FRESHLY MIXED CONCRETE BY THE VOLUMETRIC METHOD. Part 10 ASTM Designation C 173-66.

- (81) AIR CONTENT OF FRESHLY MIXED CONCRETE BY PRESSURE METHOD. Part 10 ASTM Designation C 231-62.
- (82) SLUMP OF PORTLAND CEMENT CONCRETE. Part 10 ASTM Designation C 143-66.
- (83) FLOW OF PORTLAND CEMENT CONCRETE BY USE OF THE FLOW TABLE. Part 10 ASTM Designation C 124-39 (1966).
- (84) COMPRESSIVE STRENGTH OF CONCRETE USING PORTIONS OF BEAMS BROKEN IN FLEXURE. Part 10 ASTM Designation C 116-65T.
- (85) FUNDAMENTAL TRANSVERSE, LONGITUDINAL, AND TORSIONAL FREQUENCIES OF CONCRETE SPECIMENS. Part 10 ASTM Designation C 215-60.
- (86) CEMENT CONTENT OF HARDENED PORTLAND CEMENT CONCRETE. Part 10 ASTM Designation C 85-66.
- (87) LENGTH CHANGE OF CEMENT MORTAR AND CONCRETE. Part 10 ASTM Designation C 157-64T.

Note: The above standards may be obtained for personal use from American Society of Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.

✓ Create Ind 51.26

Ind 51.26 Specifications cited in this code: The specification of the American Concrete Institute referred to in this code are listed below.

- (1) Building code requirements for reinforced concrete ACI 318-63.
- (2) Minimum standard requirements for precast concrete floor and roof units ACI 512-67.
- (3) Minimum requirements for thin-section precast concrete construction ACI 525-63.

Note: The above standards may be obtained for personal use from American Concrete Institute, 7400 Second Boulevard, Detroit, Michigan.

✓ Ind 52.02 (1)(a) Repeal and recreate Ind 52.02 (1)(a) to read:

The provisions of this rule may be waived for factory, office or mercantile buildings if provisions are made for proper artificial lighting, and if ventilation is provided in accordance with the provisions of chapter Ind 59 of the Building and Heating, Ventilating and Air Conditioning Code.

✓ Repeal and recreate Ind 52.10 (6) to read:

Ind 52.10 (6) Prefabricated chimneys complying with the requirements of Wis. Adm. Code section Ind 59.67 may be used in lieu of masonry chimneys if

Department of Industry, Labor and Human Relations
approved by the _____ and are provided with foundations as
specified for masonry chimneys, or metal smokestacks or as otherwise approved.

✓ Repeal and recreate Ind 52.53 to read:

Ind 52.53 Location, light and ventilation. (1) Every toilet or bathroom shall be so located as to open to outside light and air, by windows or skylights opening directly upon a street, alley or court, except as provided in Wis. Adm. Code section Ind 52.54.

(2) The glass area for a toilet room containing one water closet or urinal shall be at least 4 square feet with at least 2 square feet openable.

(a) Bathrooms containing a water closet or urinal shall be considered as a toilet room.

(3) No toilet room shall have windows or ventilator openings in any elevator shaft or inner court that have windows of sleeping rooms above.

(4) Every toilet room having more than one fixture (closets and urinals) shall be ventilated in accordance with the provisions of Wis. Adm. Code section Ind 59.48 of the Building and Heating, Ventilating and Air Conditioning Code issued by the Department of Industry, Labor and Human Relations, the _____, except that this requirement shall not apply to chemical or septic toilets which are installed in accordance with the provisions of the chemical toilet code or the septic toilet code issued by the state board of health.

(a) The size of gravity vent ducts, if surmounted with effective siphon type hoods, may be determined as follows: $\frac{A \times 2}{300} = \text{net cross sectional area of vent duct in square feet.}$

Where A = floor area in the toilet room in square feet.

✓ Repeal and recreate Ind 52.54 to read:

Ind 52.54 Location without outside windows; when permitted. Toilet rooms will be permitted without windows if they are ventilated in accordance with the requirements of Wis. Adm. Code section Ind 59.48 of the Building and Heating,

Department of Industry, Labor and Human Relations.
Ventilating and Air Conditioning code issued by the

Repeal and recreate Ind 52.64 (4) to read:

✓ Ind 52.64 (4) Service Closets. In buildings having 5 or more fixtures (water closets and/or urinals) a service closet shall be provided conforming with the requirements for toilet rooms.

(a) The service closet shall be supplied with mop, broom, bucket, soap, toilet paper, toweling and other equipment for sanitary upkeep of toilet rooms.

✓ Section Ind 53.04 is repealed and recreated to read:

Ind 53.04

ASHLAR AND RUBBLE MASONRY. (1) The compressive stresses (pounds per square inch) in ashlar or carefully coarsed masonry and rubble stone masonry, due to all dead and live loads shall not exceed the following:

KIND OF STONE	TYPE M MORTAR	TYPE S MORTAR	TYPE N MORTAR	TYPE O MORTAR
Ashlar Masonry:				
Granite	800	720	640	500
Limestone or marble	500	450	400	325
Sandstone or cast stone	400	360	320	250
Rubble Stone Masonry	140	120	100	80

(2) WEATHER RESISTANCE OF STONE. All natural building stone to be used in masonry exposed to the weather or frost action shall be such that the strength and structure of the stone will not be affected by the weathering or frost action.

(3) All cast stone shall be branded with a permanent identification mark of the Department of Industry, Labor and Human Relations. manufacturer which shall be registered with the

(4) The average compressive strength of cast stone taken on four representative samples at the age of 28 days or when delivered on the job shall be not less than 5000 pounds per square inch with an individual minimum of 4500 pounds per square inch, and the average absorption of such samples shall be not more than 7% of their dry weight, with an individual maximum of 8%.

(5) Tests of cast stone specimens shall be made in accordance with specifications approved by the Department of Industry, Labor and Human Relations.

It will be the policy of the Department of Industry, Labor and Human Relations to accept specifications for cast stone issued by the American Concrete Institute, ACI Standard 704-44.

Copies of the above publication are on file in the office of the secretary of state, revisor of statutes and the Department of Industry, Labor and Human Relations, and may be obtained for personal use from the American Concrete Institute, 7400 Second Blvd., Detroit, Michigan.

Repeal and recreate 53.05 to read:

Ind 53.05 Building Brick

(1) DEFINITION: Building brick is a masonry unit, not less than 75 percent solid, having a shape approximating a rectangular prism and usually not larger

than 4 inches by 4 inches by 12 inches. Brick may be made of burned clay or shale or mixtures thereof, of lime and sand or of portland cement and suitable aggregates.

(2) STRUCTURE. All building brick shall be free from cracks, laminations and other defects or deficiencies which may interfere with proper laying of the brick or impair the strength or permanence of the structure.

(3) CONCRETE BUILDING BRICK. Concrete building brick shall be manufactured from a mixture of Portland cement and approved aggregates, such as sand, gravel, crushed stone, bituminous or anthracite cinders, burned clay or shale, or blast furnace slag.

(4) IDENTIFICATION. All building brick shall be of distinctive design or appearance, or marked so that the manufacturer is identified.

(5) CLAY BUILDING BRICK. (a) All building brick made of burned clay or shale shall conform to the following requirement and to the requirements of Standard Specifications for Building Brick (solid masonry units made from clay or shale) of the American Society for Testing and Materials.~ See Ind 51.25 (1) for the ASTM Designation which refers to this product or method.

COMPRESSIVE STRENGTH (BRICK FLATWISE) Lbs. Per Square Inch Average Gross Area			Water Absorption By 5 Hour Boiling Percent		C/B Ratio	
Grade	Average of 5 Bricks	Individual Minimum	Average of 5 Bricks	Individual Maximum	Average of 5 Bricks	Individual Maximum
A	8000	6650	17.0	20.0	.78	.80
B	4500	3750	17.0	20.0	.78	.80
S.W.	3000	2500	17.0	20.0	.78	.80
M.W.	2500	2200	22.0	25.0	.88	.90
N.W.	1500	1250	No Limit	No Limit	No Limit	No Limit

(b) The saturation coefficient (C/B ratio) is the ratio of absorption by 24-hour submersion in water at room temperature to that after 5 hour submersion in boiling water.

(c) If the average compressive strength is greater than 8000 pounds per square inch and or the average water absorption is less than 8 percent by weight after 24-hours submersion in cold water, the C/B ratio shall be waived.

(d) Grade A, B and S.W. brick shall be used in exterior and exposed locations where a high degree of resistance to frost action is desired and the exposure is such that the brick may be frozen when permeated with water.

Brick used for foundation courses, retaining walls, parapet walls and similar locations shall conform to A, B, or S.W.

(e) Grade M.W. brick may be used where exposed to temperatures below freezing but where brick are not likely to be permeated with water or where a moderate degree of resistance to frost action is permissible.

Brick conforming to this grade may be used in an exterior wall above grade.

(f) Grade N.W. brick may be used for backup or for interior construction exposed for use where no frost action occurs.

(6) CONCRETE SAND-LIME BUILDING BRICK. All building brick made from sand-lime shall conform to the following requirements and to the requirements of Standard Specifications for Sand-Lime Building Brick of the American Society for Testing and Materials. See Ind 51.25 (2) for the ASTM Designation which refers to this product or method.

DESIGNATION	Minimum Compressive Strength (brick flatwise), psi, average gross area		Minimum Modulus of Rupture (brick flatwise), psi, average gross area	
	Average of 5 Brick	Individual	Average of 5 Brick	individual
Grade SW	4500	3500	600	400
Grade MW	2500	2000	450	300
Grade NW	1500	1500	300	200

(7) CONCRETE BUILDING BRICK: All building brick made from portland cement, water, and suitable mineral aggregates shall conform to the following requirements and to the requirements of Standard Specifications for Concrete Building Brick of the American Society for Testing and Materials. See Ind 51.25 (3) for the ASTM Designation which refers to this product or method.

GRADE	Compressive Strength, Min, psi (brick flatwise)		Water Absorption, Max. lb per cu ft (Average of 5 Units)		
	Average Gross Area		Oven-Dry Weight of Concrete, lb per cu ft.		
	Average of 5 Brick	Individual Brick	Over 125	From 105 to 125	105 or less
U-1, U-11	3500	3000	10	10	10
P-1, P-11	2500	2000	13	13 to 18	18
G-1, G-11	1500	1250

(8) TESTS. Typical specimens of all types of building brick shall be tested initially to prove compliance with the provisions of this code.

(a) All concrete and sand, lime, brick shall be retested at intervals of not more than one year.

(b) All building brick manufactured from burned clay or shale shall be retested with changes in raw materials or processing and at intervals of not more than three years.

(c) Further tests may be demanded at any time there is reasonable suspicion of nonconformance to the requirements of this code.

(9) STANDARDS. The testing of all building brick shall be in accordance with the standard methods for testing brick of the American Society for Testing Materials. See Ind 51.25 (4) for the ASTM Designation which refers to this product or method.

Copies of the above publications are on file in the office of the secretary of Department of Industry, Labor and Human Relations state, revisor of statutes and the and may be obtained for personal use from the American Society for Testing Materials, 1916 Race Street, Philadelphia, Pa. 19103.

✓ Repeal and recreate Ind 53.06 to read:

Ind 53.06 Hollow building units.

(1) DEFINITIONS. Hollow building units are masonry units whose net cross-sectional area in any plane parallel to the bearing surface is less than 75 percent of its gross cross-sectional area measured in the same plane.

(a) Hollow concrete masonry units are the products of Portland cement and suitable aggregates such as sand, gravel, crushed stone, bituminous or anthracite cinders, burned clay or shale or blast furnace slag, molded to permanent form for use as masonry units in building construction. Hollow concrete masonry units with applied facings of any type shall conform to the requirements of this code.

(2) HOLLOW TILE USED IN BEARING WALLS. All hollow tile used in bearing walls shall conform to the requirements of Standard Specifications for Structural Clay Load-Bearing Wall Tile, of the American Society for Testing Materials. See Ind 51.25 (5) for the ASTM Designation which refers to this product or method.

(a) Hollow tile subject to the action of weather or soil shall be of Grade LBX, or, if used for load-bearing purposes but not subject to the action of weather or soil, shall be of Grade LB or Grade LBX of this specification.

(3) BRANDING. All clay tile shall be branded with a distinctive indentation on the shell. Clay tile which comply with all requirements for exterior construction and bearing walls shall have the word BEARING impressed on them. All clay tile shall bear the name, initials or trademark of the manufacturer.

(4) TESTS. Typical specimens of all sizes and designs of hollow tile used in exterior or bearing walls shall be tested originally to prove compliance with Department of Industry, Labor and Human Relations. this code, and thereafter as directed by the Department of Industry, Labor and Human Relations. Tile shall be sampled and tested in accordance with the standard methods of sampling and testing structural clay tile of the American Society for Testing Materials. See Ind 51.25 (6) for the ASTM Designation which refers to this product or method.

(5) HOLLOW CONCRETE MASONRY UNITS. (a) Compressive strength. All hollow concrete masonry units shall have a compressive strength of not less than 1000 pounds per square inch gross area as laid in the wall.

1. The average strength of any group of test specimens of hollow concrete masonry units shall not be less than the above requirement. The strength of any individual test specimen shall not be less than 900 pounds per square inch gross area.

(b) Absorption. Hollow concrete masonry units shall not absorb more than 14 pounds of water per cubic foot of concrete actually contained.

(c) Branding. At least one-third of all hollow concrete masonry units shall be branded with a distinctive indentation or waterproof stencilled mark, which shall bear the name, initials, or trademark of the manufacturer. All cubes or piles of block on the job shall be easily identified by branded block which are visible. Producers having more than one plant shall register and use a separate, distinctive brand for each plant. A facsimile of each individual brand shall be filed with the Department of Industry, Labor and Human Relations.

(d) Tests. Typical specimens of all sizes and designs of hollow concrete masonry units shall be tested in an approved manner, originally to prove compliance with Department of Industry, Labor and Human Relations the requirements of this code, and thereafter as required by the Department of Industry, Labor and Human Relations or its authorized agents. Hollow concrete masonry units shall be

sampled and tested in accordance with the standard methods of sampling and testing of the American Society for Testing Materials. See Ind 51.25 (7) for the ASTM Designation which refers to this product or method.

(e) Sampling. Hollow concrete masonry units shall be done only by the Department of Industry, Labor and Human Relations or their authorized agents. The time and place of sampling shall be at the discretion of the Department of Industry, Labor and Human Relations or their authorized agents. It is intended that such tests will be made at intervals not to exceed one year.

1. At the time of the sampling, the producer or purchaser shall inform the sampling agent of the name and location of the approved testing laboratory to which the samples will be sent for testing. The sampling agent shall notify the Department of Industry, Labor and Human Relations of the date, number, size, type and seal numbers of the samples selected. Compression tests shall be completed not later than 7 days after sealing. To validate the test, all seals must be accounted for in the laboratory report.

2. Producers having more than one plant will be considered as separate plants with separate samplings and tests for each plant.

(f) Approvals. Approvals following original tests will remain in effect until later tests show nonconformance with the requirements of this code. To verify compliance with these requirements, the Department of Industry, Labor and Human Relations may require that tests be made at its designated laboratory.

(g) Nonapprovals. Nonconformance with the requirements of Wis. Adm. Code section Ind 53.06 shall be determined by the failure of 3 complete tests on a particular job, as tested in an approved manner. In the event of job nonconformance, the necessary structural correction shall be made and the producer shall be barred from supplying any more units on that project.

(h) Certification. Testing laboratories must apply annually for certification by the Department of Industry, Labor and Human Relations.

Such certification shall be based on standards established by the Department of Industry, Labor and Human Relations. Only those tests that are made by

a certified laboratory will be accepted. To verify compliance with these standards the Department of Industry, Labor and Human Relations may require that tests be made at its designated laboratory.

1. The owner or supplier shall have the choice of selecting a certified testing laboratory for any tests at his expense.

(6) CLAY TILE USED IN NONBEARING PARTITIONS. All hollow clay tile used in nonbearing partitions shall conform to the requirements of Standard Specifications for Structural Clay Non-Load Bearing Tile of the American Society for Testing and Materials. See Ind 51.25 (8) for the ASTM Designation which refers to this product or method.

(a) Branding. All hollow clay tile used in nonbearing partitions shall be branded with a distinctive indentation. All hollow clay tile not suitable for use in bearing and exterior walls but used in nonbearing partitions shall have the word PARTITION impressed on them.

1. All hollow clay tile used in partition work shall bear the name, initials or trademark of the manufacturer.

(7) HOLLOW CONCRETE MASONRY UNITS USED IN NONBEARING PARTITIONS. All hollow concrete masonry units used in nonbearing partitions shall comply with the requirements of Wis. Adm. Code subsection Ind 53.06 (5).

(8) CLAY TILE AND HOLLOW CONCRETE MASONRY UNITS USED IN FLOOR CONSTRUCTION.

(a) General requirements. Where clay tile and hollow concrete masonry units are used in concrete floor construction in a way that the whole or any portion of a tile or hollow concrete masonry unit is subjected to load, the requirements for such clay tile shall conform to the standard specifications for structural clay

floor tile of the American Society for Testing and Materials. See Ind 51.25 (9) for the ASTM Designation which refers to clay tile. The hollow concrete masonry unit shall conform to the requirements stated in Wis. Adm. Code section Ind 53.06 (5) of the Building and Heating, Ventilating and Air Conditioning Code issued by the Department of Industry, Labor and Human Relations.

(b) Tile and masonry floor units. Where hollow clay tile or hollow concrete masonry units are used in concrete floor construction in a way that no portion of a tile or block is subjected to a load, the requirements which apply to tile or block used in partitions shall apply.

(c) Branding. All clay tile or concrete masonry units used in floor construction shall conform to the branding requirements of subsection (5)(c).

Copies of the above publications are on file in the office of the secretary of Department of Industry, Labor and Human Relations state, revisor of statutes and the ~~Department of Industry, Labor and Human Relations~~ and may be obtained for personal use from the American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103.

✓ Repeal and recreate Ind 53.07 to read:

Ind 53.07 Allowable unit stresses in masonry.

(1) The compressive stresses in masonry walls, partitions, piers and similar bearing masonry shall not exceed the values shown in the following table.

(2) In determining the stresses in the masonry, the effects of all loads and conditions of loading and the influence of all forces affecting the design and strength of the several parts shall be taken into account. Stresses shall be calculated on actual rather than nominal dimensions.

(3) In composite walls or other structural members composed of different kinds or grades of units or mortars, the maximum stress shall not exceed the allowable stress for the weakest of the combinations of units and mortars of which the member is composed.

(4) Higher stresses than herein specified may be used if tests, materials of a higher grade, or superior workmanship under approved inspection are provided to the satisfaction of the Department of Industry, Labor and Human Relations.

Type of construction and Compressive Strength of Masonry Units	Allowable Compressive Stresses Gross Cross-Sectional Area (except as noted)			
	Type M Mortar	Type S Mortar	Type N Mortar	Type O Mortar
	psi	psi	psi	psi
Burned clay or shale brick:				
8,000 psi plus	400	350	300	200
4,500 to 8,000 psi	250	225	200	150
2,500 to 4,500 psi	175	160	140	110
1,500 to 2,500 psi	125	115	100	75
Sand-lime or concrete brick:				
2,500 psi plus	175	160	140	110
Solid concrete masonry units;				
1,800 psi plus	175	160	140	100
1,200 to 1,800 psi	125	115	100	75
Masonry of hollow units				
1,000 psi	85	75	70	--
Masonry of hollow units, cellular spaces filled (Note a)	105	95	90	--
Cavity walls or masonry bonded hollow walls (Note b)				
Solid units: 2,500 psi plus	140	130	110	--
Solid units: 1,500 to 2,500 psi	100	90	80	--
Hollow units	70	60	55	--
Grouted solid masonry of clay or shale brick; sand-lime or concrete brick: (Note c)				
4,500 psi plus	350	275	200	--
2,500 to 4,500 psi	275	215	155	--
1,500 to 2,500 psi	225	175	125	--

Note (a) All cellular spaces filled solidly with concrete of either Type M or S mortar.

Note (b) Allowable stresses apply to the gross cross-sectional area of wall minus area of cavity between wythes. Where cavity or masonry bonded hollow walls are loaded concentrically, the allowable stresses may be increased by 25 percent.

Note (c) Grouted joints require that all joints be filled full with mortar. Refer to Sec. Ind 53.08.

(5) If the design unit stress employed for any type of masonry exceeds 175, 160, 140, 110 or 75 for mortar type M, S, N, and O respectively, the plan or specification shall note the unit stress, type of mortar and kind of joint.

Notification of the type and brand of masonry unit shall be filed with the Department of Industry, Labor and Human Relations, including satisfactory evidence of test.

✓ Repeal and recreate Ind 53.08 to read:

Ind 53.08 Mortar and Grout. (1) GENERAL REQUIREMENTS. All materials used as ingredients for mortar and grout shall conform to the following specifications of the American Society for Testing and Materials: See Ind 51.25 (10 thru 17) for the ASTM Designation which refers to these products or methods.

(a) Hydrated lime mortar made with type N--normal hydrated lime for masonry purposes, after suction for 60 sec. shall have a water retention value of not less than 75 percent when tested in a standard mortar made from the dry hydrate or from putty made for the hydrate which has been soaked for a period of 16 to 24 hours.

(b) Hydrated lime mortar made with type S--special hydrated lime for masonry purposes shall have a water retention value of not less than 85 percent when tested in a standard mortar made from the dry hydrate.

(2) MORTAR. Mortar shall consist of a mixture of cementitious material and aggregate conforming to the requirements of the following table:

MORTAR PROPORTIONS BY VOLUME

Mortar Type	Parts by Volume of Portland Cement, or Portland Blast-Furnace Slag Cement	Parts by Volume of Masonry Cement	Parts by Volume of Hydrated Lime or Lime Putty	Aggregate Measured in a Damp, Loose Condition
M	1 1	1 (Type II) ---	-- 1/4	Not less than 2-1/4 and not more than 3 times the sum of the volumes of the cement and lime used.
S	1/2 1	1 (Type II) ---	-- over 1/4 to 1/2	
N	-- 1	1 (Type II) ---	-- Over 1/2 to 1-1/4	
O	-- 1	1 (Type II) ---	-- Over 1-1/4 to 2-1/2	

(3) GROUT. Grout shall be Type M, Type S, or Type N mortar to which water is added to produce consistency for pouring without segregation of constituents.

(4) MIXING. All cementitious materials and aggregate shall be thoroughly mixed with sufficient water added to produce a mortar with workable consistency.

(5) ~~53-08~~ ADDITIVES: Where metal ties, anchors or reinforcement are imbedded in masonry, chloride and nitrate base salts or materials containing same shall not be used in the masonry construction.

(6) GYPSUM MORTAR. Gypsum mortar shall be composed of one part of gypsum and not more than three parts of mortar aggregate.

(7) MORTAR PERMITTED. Masonry shall be laid in mortar of the types specified in the following table:

KIND OF MASONRY

TYPES OF MORTAR PERMITTED

Masonry in contact with earth	M
Masonry above grade or interior masonry:	
Piers of solid units	M, S, or N
Piers of hollow units	M or S
Walls of solid units	M, S, N, or O
Walls of hollow units	M, S, or N
Chimneys	M, S, or N
Cavity walls or masonry bonded hollow walls	M, S, or N
Grouted solid masonry	M, S, or N
Nonbearing partitions and fireproofing	M, S, N, O or Gypsum
Gypsum tile or block	Gypsum
Fire brick	Refractory air setting Mortar.

✓ Repeal and recreate Ind 53.09 to read:

Ind 53.09 Bearing masonry walls, bearing partitions and piers. (1) GENERAL REQUIREMENTS. All masonry units used in the construction of bearing walls, bearing partitions and piers shall conform in all respects to the requirements for bearing units.

(2) UNIT STRESSES. The unit stresses in bearing masonry walls, partitions and piers shall not exceed those specified in Wis. Adm. Code sections Ind 53.04 and Ind 53.07.

(3) MORTARS. Masonry shall be laid in mortar conforming to the types specified in Wis. Adm. Code subsection 53.08 (6).

(4) MASONRY BOND. Masonry shall be bonded longitudinally in each wythe, transversely between wythes, and at intersections as follows:

(a) Longitudinal bond. Not less than 60 percent of the units in any transverse vertical plane shall lap the ends of units above and below a distance not less

than 2 inches or one-third the height of the unit, whichever is greater, or the masonry shall be reinforced longitudinally as required for masonry laid in stack bond.

(b) Transverse bond. In brick masonry or in combinations of brick and other masonry units the facing and backing (adjacent wythes) shall be bonded by one of the following methods:

1. Bonding with headers. The facing and backing shall be bonded by a full header course of brick extending not less than $1/3$ their length into the backing and spaced at intervals not greater than every sixth course of brick or equivalent. By equivalent is meant that $1/6$ of the wall surface shall be header or bond units. The clear distance between bond courses shall not exceed 16 inches. Where the backing consists of 2 or more wythes, the headers shall extend not less than 4 inches into the most distant wythe or the backing wythe shall be bonded together with separate headers whose area and spacing conform to the foregoing.
2. Bonding with Metal Ties. Reinforcement for embedment in the horizontal mortar joints shall consist of metal ties conforming to Ind Section 53.11 (3)(a) or of a continuous tie assembly with not less than #9 wire deformed longitudinal rods and #9 gauge cross wires. Cross wires shall be weld connected, spaced not more than 16 inches along the longitudinal rods, and shall be galvanized or coated with other approved corrosion-resistant material. The coating shall be not less than 0.8 oz. per sq. ft. Out-to-out spacing of longitudinal rods shall be approximately two inches less than the nominal thickness of the wall or wythe in which reinforcement is used. Tie assemblies shall be spaced at vertical intervals not exceeding 16 inches. Where the space between metal tied wythes is solidly filled with mortar, the allowable stresses and other provisions for masonry bonded walls shall apply. Where the space is not filled, metal tied walls shall conform to the allowable stresses, lateral support, thickness (excluding cavity), and height requirements for cavity walls as stated in section Ind 53.11.

(c) Stack Bond. Load bearing walls having one or more wythes with inadequate longitudinal masonry bond shall be tied and reinforced as described in Sec.

Ind 53.09 (4)(b) 2.

53.09 (4)(c)(1)

1. Reinforcement for bearing walls having a single wythe shall consist of a continuous tie assembly with the equivalent of not less than #9 gauge deformed longitudinal rods and #9 gauge cross wires spaced at vertical intervals not exceeding 16 inches.

(d) Bonding at Intersections. Where two bearing walls meet or intersect, the intersections shall be bonded by one of the following methods:

1. By laying in a true bond at least 50 percent of the units at the intersection.

2. By regular tothing or blocking with 8 inch maximum offsets and the joints provided with the equivalent of not less than 1-1/4 inch or 1/4 inch by 24 metal anchors with hooked or cross pinned ends for anchorage. Such anchors shall be spaced not more than 4 feet apart.

3. By alternate details which are designed to permit differential movements at the intersections of interior and exterior walls provided such details are consistent with the requirements for lateral stability of the walls.

(5) USE OF HOLLOW CLAY TILE AND HOLLOW CONCRETE MASONRY UNITS. Approved clay tile and hollow concrete masonry units may be used in bearing walls of buildings not more than 3 stories, or 40 feet in height. In determining this height, the basement or foundation wall shall be considered a story if constructed of clay tile or concrete masonry units.

(6) LOADING. Concentrated loads shall be transmitted to hollow clay tile or hollow concrete block masonry by at least 3 courses of brick or equivalent concrete or by a metal plate of sufficient thickness and size to distribute the load to the webs and shells in such a manner as not to exceed the unit allowable stress.

(7) PARTY WALL CONSTRUCTION. Where hollow clay tile or hollow concrete masonry units are used in party walls, there shall be not less than 2 such units, each 8 inches in thickness as a minimum, used in making up the thickness of the wall unless solid masonry is used for building all chases, recesses, framing of all openings, and for the support, anchorage, and protection of all joists and beams carried into such wall.

53.09 (8) WALL CONSTRUCTION. All hollow concrete masonry units and other hollow units not designed for the same loading in either a horizontal or vertical position shall be laid with the cells in a vertical position, when used in a bearing wall.

(8a) In clay tile or concrete masonry unit construction, all vertical and horizontal joints designed to receive mortar or grout shall be completely filled.

(b) Height and thickness. All hollow concrete masonry bearing walls shall be limited to the following values:

		Thickness in Inches	Maximum Height in Feet	Maximum Roof or Floor Span in Feet	Maximum Spacing of Crosswalls or Pilasters in Feet	Pilasters Minimum Size in Inches*
Single Story	6	9	18	15	12	
	8	12	25	20	12	
	10	15	30	25	14	
	12	18	40	None Required	16	
Top Story of Buildings Not Over 3 Story		8	10	20	30	12
Multi- Story	Upper 40 ft. or 3 Stories	12	3 Stories or 40 Feet		18	16

*Size is for lateral stability only. See Sec. Ind 53.09 (8).

1. Masonry crosswalls or pilasters may be omitted in hollow concrete masonry bearing walls 12 inches or more in thickness where such walls are supported horizontally by floors or roofs at heights not exceeding 18 times the wall thickness.
2. Stiffened Walls. Where solid masonry bearing walls are stiffened at distances not greater than 12 feet apart by masonry cross walls or by reinforced concrete floors, they may be of 12-inch thickness for the uppermost 50 feet, measured downward from the top of the wall, and shall be increased 4 inches in thickness for each successive 50 feet or fraction thereof.
3. Brick masonry bearing walls shall have a thickness of at least $1/20$ of their unsupported height or width, whichever is the shorter. In addition, the thickness of such bearing walls shall be not less than 6 inches for walls 10 feet or less in height and the minimum thickness shall be increased 1 inch for each successive 10 feet or fraction thereof in height.

(c) Pilaster. An unreinforced masonry section bonded to the adjoining wall by one of the following methods:

1. By the use of pilaster blocks by alternate course bond of masonry with adjoining wall.
2. Pilasters. The least dimension in inches for pilasters carrying beams, trusses, and girders shall be not less than $1/40$ the span and the height shall not exceed 12 times the least dimension for solid or hollow masonry. Joists with spans not more than 40 feet and spacings not more than 6 feet on center shall not be considered as beams or girders if a continuous bond beam is used for spacings of over 4 feet. A bond beam made up of not less than 8 inch lintel blocks may be used if 2 No. 4 bars are embedded in 3000 p.s.i. concrete fill. An equivalent bond beam of other materials is acceptable.
3. The dimension of pilasters used for lateral stability only, shall be no less than 4 inches greater in thickness than the principal wall nor less than 16 inches in length.

(d) Piers. An isolated column of masonry. A bearing wall not bonded at the sides into associated masonry shall be considered a pier when its horizontal dimension measured at right angles to the thickness does not exceed four times its thickness. The least dimension shall not be less than $1/30$ of the span, in inches, and the height shall not exceed 10 times the least dimension for solid or grouted masonry piers or 6 times the least dimension for hollow masonry piers.

(e) Walls below Grade. Masonry walls which are in contact with the soil shall be of sufficient strength and thickness to resist the lateral pressure from the adjacent earth and to support their vertical loads without exceeding the allowable stresses. The minimum thickness for masonry walls below grade shall be 4 inches greater than the required thickness for the walls of the supported structures except that 12 inch walls will be accepted for buildings not more than 2 stories in height if substantial lateral support consisting of masonry walls, offsets or pilasters are provided at intervals of not to exceed 20 feet.

(f) Stone walls. Rough or random or coursed rubble stone walls shall be 4 inches thicker than is required by Wis. Adm. Code subsection 53.09 (8)(a) but in no case less than 16 inches thick.

1. Stone not less than 4 inches thick may be considered as part of the required thickness of a wall if bonded to the backing as required for brickwork, see Sec. Ind 53.09 (4)(b) 1 or (4)(b) 2. No such wall shall be less than 12 inches thick.

(g) Chases, recesses and openings. There shall be no chases in 8 inch walls or in any pier. No chase in wall greater than 8 inches shall be deeper than $1/3$ the wall thickness. No horizontal chase shall exceed 4 feet in length nor shall the horizontal projection of any diagonal chase exceed 4 feet. No vertical chase shall be closer than 2 feet to any pilaster, cross wall, end wall or other stiffener.

(h) ECCENTRIC LOADS. Walls supporting eccentrically applied loads including eccentric loads produced by the deflection of floor and roof members shall be analyzed for stability and strength. Maximum unit stresses shall not exceed those specified in sections Ind 53.04 and Ind 53.07.

(i) DESIGN. The minimum thickness of masonry bearing walls may be decreased, except for walls below grade, and the height or length to thickness ratio may be increased when data is submitted to the Department of Industry, Labor and Human Relations which justifies a reduction in the requirements specified in this code.

Repeal and recreate Ind 53.10 to read:

✓ Ind 53.10 Nonbearing Masonry Walls. (1) EXTERIOR NONBEARING WALLS. All exterior nonbearing walls, if constructed with one wythe of brick to the weather may be backed with S.W. or M.W. classified clay or shale brick, concrete masonry units or clay tile conforming to the requirements of sections Ind 53.05 and Ind 53.06. If such walls are built of concrete masonry units or clay tile, such units shall conform to the requirements of Ind 53.06.

(2) INTERIOR NONBEARING WALLS. Interior nonbearing masonry walls may be built of materials conforming with the requirements of sections Ind 53.05 and Ind 53.06, or of gypsum block or other approved material.

(3) TYPE OF MORTAR. Mortar used in non-load-bearing masonry shall conform to the types specified in Wis. Adm. Code subsection 53.08 (6).

(4) MASONRY BOND AND ANCHORAGE. Exterior and interior non-load-bearing masonry walls shall be bonded longitudinally in each wythe and transversely between wythes as required for bearing walls. See Sec. Ind 53.09 (4) (a) through Ind 53.09 (4) (b) 2. For stone walls see Sec. Ind 53.09 (8) (e).

- (a) Non-load-bearing walls shall be anchored to each other at intersections and to supporting masonry by means of masonry bond or corrosion-resistant corrugated metal ties or equivalent. Corrugated metal ties shall be not less than 7/8 inches wide and No. 22 gauge in thickness and shall be located at vertical intervals not more than 16 inches on center or shall be equivalent to the foregoing.
- (b) Anchorage. Anchorage to steel or concrete supports shall be by means of not less than as specified in (a) above or equivalent methods. Anchorage at exterior walls shall be adequate to transmit wind and other lateral loads to the supports.
- (c) Stack Bond. Non-load-bearing walls, or wythes thereof, laid in stack bond or otherwise with inadequate longitudinal bond, shall be tied and reinforced as required in Wis. Adm. Code subsection 53.09 (4)(c) except that for interior non-load-bearing partitions the maximum spacing of joint reinforcement shall be 24 inches.
- (d) Masonry Veneer. Masonry veneer on wood frame structures shall be securely attached to the backing by corrosion-resistant corrugated metal ties, not less than No. 22 gauge in thickness and 7/8 inches in width or equivalent. One tie shall be used for at least each 2 square feet of wall area and the distance between ties shall not exceed 24 inches or by No. 13 gauge metal ties or equivalent located 36 inches horizontally and 18 inches vertically.
- (5) HEIGHT AND THICKNESS--INTERIOR NONBEARING MASONRY WALLS. Walls which are supported by fire-resistive construction and have tight contact with not less than 2-hour fire-resistive construction at the top, shall be not more than 36 times their thickness in clear height. Similar nonbearing walls which contact less than 2-hour fire-resistive support at the top shall be not more than 24 times their thickness in clear height. Plastering shall be included in computing the thickness.

(6) THICKNESS OF EXTERIOR NONBEARING WALLS. The thickness of exterior nonbearing walls shall be not less than $1/24$ of the clear height but in no case less than 8 inches. Where 8 inch or 10 inch walls are used, the horizontal distance between vertical supports shall be not less than 30 times the wall thickness.

(7) WALLS BELOW GRADE. See Wis. Adm. Code section Ind 53.09 (8)(e).

(8) DESIGN. The minimum thickness of non-load-bearing walls may be decreased and the height or length to thickness ratio may be increased when data is submitted to the Department of Industry, Labor and Human Relations, which justifies a reduction in the requirements specified in this code.

✓ Repeal and recreate Ind 53.11 to read:

✓ Ind 53.11 CAVITY WALLS. (1) Load-bearing and non-load-bearing walls of the cavity type may be built of solid or hollow masonry units or combinations thereof subject to the following requirements as well as other applicable requirements of this code. The description of a cavity wall is determined by its nominal out-to-out dimension.

(a) For allowable unit stresses see Wis. Adm. Code section Ind 53.07 for masonry. In computing the unit stresses, the effective cross sectional area of the cavity walls shall be taken as the gross cross sectional area minus the area of the cavity.

(b) For mortar requirements see Wis. Adm. Code section Ind 53.08 (6).

(2) Thickness. The facing and backing of cavity walls shall each have a thickness of at least 4 inches and the space between the facing and backing shall be not less than 2 inches nor more than 3 inches in width. The backing wythe shall be at least as thick as the facing wythe.

(a) The maximum height between supports shall be 10 feet for 10 inch cavity walls. For other wall thicknesses, it shall not exceed 18 times the sum of the nominal thickness of the inner and outer wythes. The overall height of a 10 inch cavity wall shall not exceed 25 feet. The overall height of all other cavity walls shall not exceed 35 feet.

(3) Bonding. The facing and backing of cavity walls shall be bonded with $3/16$ inch diameter metal unit ties or the equivalent or with the equivalent of metal reinforcement having #9 inch longitudinal rods and #9 gauge cross wires. Metal ties shall

be of corrosion-resistant metal or coated with a corrosion-resistant metal, or other approved protective coating.

(a) Metal ties. There shall be one 3/16 inch steel rod or metal tie of equivalent strength or stiffness for not more than each 4-1/2 square feet of wall area. Ties in alternate courses shall be staggered, the maximum vertical distance between ties shall not exceed 18 inches, and the maximum horizontal distance shall not exceed 36 inches. Ties bent to rectangular shape shall be used with hollow masonry units laid with the cells vertical; in other walls the ends of ties shall be bent to 90-degree angles, Z shaped, to provide hooks not less than 2 inches long. Additional bonding ties shall be provided at all openings spaced not more than 3 feet apart around the perimeter and within 12 inches of the opening.

(b) Cross-wire ties. Cross wires (at least #9 gauge or larger) of masonry joint reinforcement shall be spaced to provide equivalent strength and stiffness across the cavity space to that provided by 3/16 inch Z shaped ties for each 4-1/2 square feet of wall area.

(c) Ties specified above shall be installed in the first mortar joint below floor and roof bearing courses.

(4) Cavity Drain. In exterior walls of cavity construction, suitable flashing shall be installed at the bottom of the cavity so as to drain outwardly any water which penetrates the facing. Open vertical joints, or weep holes, shall be provided every 2 to 3 feet horizontally in the facing above the flashing.

(5) Stack Bond. Masonry joint reinforcement shall conform to the requirements as specified in this section.

(6) Cavity Walls Below Grade. Cavity walls shall not be built below grade unless designed to resist the lateral pressure due to backfilling operations and earth pressure.

✓ Repeal and recreate Ind 53.14.

Ind 53.14 Concrete Requirements.

(1) ADOPTED STANDARDS: The following American Concrete Institute standards are adopted as part of the building, heating, ventilating and air conditioning code Department of Industry, Labor and Human Relations. Issued by the Wisconsin See Ind 51.26 for the ACI designation which refers to this product or method.

- (a) Building code requirements for reinforced concrete.
- (b) Minimum standard requirements for precast concrete floor and roof units.
- (c) Minimum requirements for thin-section precast concrete construction.

(2) RECOMMENDED STANDARDS: The following standards which are a part of the standards Department of Industry, Labor and Human Relations stated in (1) are recognized by the Wisconsin as being good engineering practice but are not included as part of the building, heating, ventilating and air conditioning code issued by the Wisconsin Department of Industry, Labor and Human Relations.

- (a) Recommended practice for evaluation of compression tests results of field concrete.
- (b) Recommended practice for cold weather concreting.
- (c) Recommended practice for hot weather concreting.
- (d) Recommended practice for selecting proportions for structural lightweight concrete.
- (e) Manual of standard practice for detailing reinforced concrete structures.
- (f) Recommended practices for welding reinforced steel, metal inserts and connections in reinforced concrete construction.
- (g) Arc and gas welding in building construction.
- (h) Mild steel arc-welding electrodes.
- (i) Standard qualification procedure.

✓ Repeal and recreate Ind 55.44 to read:

Ind 55.44 Ventilation of booths. Every booth or room housing projection, sound or any other equipment which vitiates good air conditions or requires

the attention of an attendant shall be ventilated as required by section Ind 59.43 of the Building and Heating, Ventilating and Air Conditioning Code issued by the Department of Industry, Labor and Human Relations. Fresh air intakes in booth walls, except for outside air, shall not exceed 72 square inches in area, nor be more than 3 inches above the floor. They shall be equipped with automatic shutters as described for projection openings.

Sections Ind 53.15; 53.16; 53.17; 53.18; 53.19; 53.20; 53.21 and 53.22 are repealed.

Section Ind 53.23 is renumbered to be Ind 53.15

" Ind 53.24 " " " " Ind 53.16

" Ind 53.25 " " " " Ind 53.17

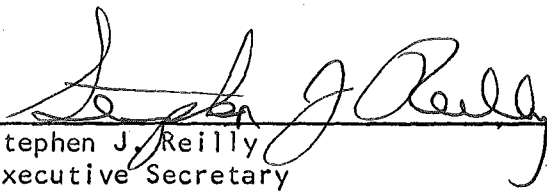
" Ind 53.26 " " " " Ind 53.18

" Ind 53.27 " " " " Ind 53.19

" Ind 53.28 " " " " Ind 53.20

The rules contained herein shall become effective on the first day of the month following publication in the Wisconsin Administrative Code as provided in Section 227.

WISCONSIN DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATION



Stephen J. Reilly
Executive Secretary

August 4, 1967