

Ind 51 to 57

Filed June 29, 1971
10:40 am


STATE OF WISCONSIN)
) SS
DEPARTMENT OF INDUSTRY,)
LABOR AND HUMAN RELATIONS)

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Stephen J. Reilly, Executive Secretary of the Department of Industry, Labor and Human Relations, and custodian of the official records of said Department, do hereby certify that the attached rules to Wisconsin Administrative Code, Chapters 50-59, Building and Heating, Ventilating and Air Conditioning, were adopted by the Department of Industry, Labor and Human Relations on June ~~24~~ 25, 1971, to supplement rules adopted on June 14, 1971.

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 25 day of June, A.D., 1971.


Stephen J. Reilly, Executive Secretary

SUPPLEMENT ORDER OF

DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS

Pursuant to authority vested in the Department of Industry, Labor and Human Relations by Section 101.01 to 101.29 Wis. Stats., the Department of Industry, Labor and Human Relations hereby repeals, recreates and adopts rules of Wisconsin Administrative Code, Chapters 50-59, Building and Heating, Ventilating and Air Conditioning.

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

SUPPLEMENT ORDERS

TO

RULES ADOPTED ON JUNE 14, 1971

The following page numbers are in reference to page numbers of file copy on orders adopted June 14, 1971.

On page 5 - Add the following:

Subsection Ind 51.02(6) is repealed effective August 1, 1971.

On page 6 - Add the following:

Subsection Ind 51.03(2) is repealed effective August 1, 1971.

On page 9 - Incomplete order corrected.

Section Ind 51.06 is created effective August 1, 1971 and expiring January 1, 1972 to read:

Ind 51.06 Fire-resistive floor construction. (1) Fire-resistive floor construction shall be accepted for the following respective degrees of fire-resistive protection when constructed as specified in this section. They shall be constructed entirely of incombustible materials.

(2) FOUR-HOUR CONSTRUCTION. Four-hour fire-resistive floor construction shall consist of reinforced concrete, gypsum or solid masonry slabs or arches not less than 4 inches in thickness, or shall consist of hollow masonry slabs or arches not less than 4 inches in thickness with a top covering of not less than 2 inches of solid masonry, or shall consist of steel joists or steel floor construction protected with fire-resistive materials as tabulated in this section. Except in the case of steel joisted construction, all reinforcing, tie rods and supporting structural members in such floors shall be protected with not less than 4-hour fire-resistive construction as specified in section Ind 51.04.

(3) THREE-HOUR CONSTRUCTION. Three-hour fire-resistive floor construction shall consist of reinforced concrete, gypsum or solid masonry slabs or arches not less than 2½ inches in thickness, or shall consist of hollow masonry slabs or arches not less than 4 inches in thickness with a top covering of solid masonry not less than 1½ inches in thickness, or shall consist of steel joists or steel floor construction protected with fire-resistive materials as tabulated in this section. Except in the case of steel joisted construction all reinforcing, tie rods and supporting structural members in such floor construction shall be protected with not less than 3-hour fire-resistive construction as specified in section Ind 51.04.

(4) TWO-HOUR CONSTRUCTION. Two-hour fire-resistive floor construction shall consist of reinforced concrete, gypsum or solid masonry slabs or arches not less than 2½ inches in thickness, or shall consist of hollow masonry slabs or arches not less than 3 inches in thickness with a top covering of not less than one inch of solid masonry, or shall consist of steel joists or steel floor construction protected with fire-resistive materials as tabulated in this section. Except in the case of steel joisted construction all reinforcing, tie rods and

supporting structural members in such floor construction shall be protected with not less than 2-hour fire-resistive construction as specified in section Ind 51.04.

(5) ONE-HOUR CONSTRUCTION. One-hour fire-resistive floor construction shall consist of reinforced concrete, gypsum or solid masonry slabs not less than 2½ inches in thickness, or shall consist of hollow masonry slabs or arches not less than 3 inches in thickness with all joints in such hollow unit construction thoroughly filled with cement or gypsum mortar, or shall consist of steel joists or steel floor construction protected with fire-resistive materials as tabulated in this section, or shall consist of wood joisted construction with a double wood floor on top (the sub-floor not less than ¾ inch thick, and the total thickness of the two layers not less than 1¼ inches thick) and with a fire-resistive ceiling as tabulated in this section, securely fastened to or suspended from the under side of such joists, except that the metal lath and plaster ceiling shall not be required below the lowest floor joist over unusable space.

(6) Except in the case of steel joisted construction, all reinforcing, tie rods and supporting structural members shall be protected with not less than one-hour fire-resistive construction as specified in section Ind 51.04.

(7) MINIMUM PROTECTION FOR METAL AND WOOD JOISTS BASED ON TIME PERIODS FOR VARIOUS INSULATING MATERIALS.

MINIMUM PROTECTION FOR METAL AND WOOD JOISTS BASED ON TIME PERIODS FOR VARIOUS INSULATING MATERIALS

| Joists to be Protected | Insulating Material | Minimum thickness of material in inches for the following fire-resistive materials | | | |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------|-------|-------|
| | | 4 Hr. | 3 Hr. | 2 Hr. | 1 Hr. |
| Ceiling protection of steel joists, where incombustible slab not less than 2½ in. thick is placed above | Metal or wire lath and gypsum or Portland cement plaster, concrete, burned clay products or gypsum | 2 | 1½ | 1 | ¾ |
| | Gunite | 1½ | 1 | ¾ | ¾ |
| Ceiling protection of wood joists with double floor on top | Metal or wire lath and gypsum or Portland cement plaster. ¾ in. perforated gypsum lath, ½ in. gypsum plaster, joints reinforced with 3 in. wide strips of metal lath. | | | | ¾ |

(8) All flat ceilings where the ceiling protection for beams, girders or flat slabs is suspended to form a free air space between the member and the protection, the protection thickness may be ½ inch less than required in the tabulation contained in this section for flat ceiling protection, but no thickness shall be less than ¾ inch minimum protection of metal and wood joists.

(9) In any reinforced concrete floor construction which includes a metal lath and cement or gypsum plastered ceiling on the under side, not less than ¾ inch thick, the required slab thickness may be reduced ½ inch but in no case shall be less than 2½ inches thick.

~~History: 1-2-56; r. Register, February, 1971, No. 182, eff. 7-1-71.~~

On page 10 - Add the following:

Sections Ind 51.04 through 51.048 are repealed effective August 1, 1971.

On page 26 - Order corrected to read:

Subsections Ind 51.25(88) through (93) are repealed effective August 1, 1971,
and created to become effective January 1, 1972.

DEPARTMENT OF INDUSTRY, LABOR & HUMAN RELATIONS



Stephen J. Reilly, Executive Secretary

June 25, 1971
Date

DEPARTMENTAL CORRESPONDENCE

To INDUSTRY, LABOR AND HUMAN From DOROTHY A HEIL
RELATIONS Assistant Revisor of Statutes
 Attention: Mr. Olson

Subject BUILDING AND HEATING, VENTILATING AND Date June 17, 1971
AIR CONDITIONING CODE
 Amendments filed June 15, 1971

In editing material filed June 15, 1971 covering amendments to the BUILDING code several questions occur to me.

On page 5 of your filed copy Ind 51.02(6) should be repealed effective August 1, 1971. (This would be in addition to the repeal and recreation noted)

| | | | | |
|---|----|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| " | 6 | " | " | 51.03(2) Repeal effective August 1, 1971 (This is in addition to the creation noted.) |
| " | 9 | " | " | 51.06(4) There is an omission of text. (It appears to me that printed page 12 of WIS. ADM. CODE should be inserted.) |
| " | 10 | " | " | 51. 04 through 51.048. Repeal effective August 1, 1971. (I think a repeal effective August 1, 1971 is needed in addition to the creation effective January 1, 1971) |
| " | 26 | " | " | 51.25(88) through (93) Repeal <u>effective 8-1-71.</u> According to the present language the repeal would occur on Jan. 1, 1972 which I believe is not the intention. |

I would appreciate your checking the above carefully and immediately and advising me whether I have the correct understanding of your material. I will be glad to be corrected if I am wrong about it. If an amended order is required, I would like to have it.

In order to make it possible to have the amendments processed in July effective August 1 as requested I am required to submit this material to the printer at once. Therefore I would appreciate your checking the above immediately and sending me an amended order covering the points in question.

Dart

Filed June 16, 1971
10:36 am

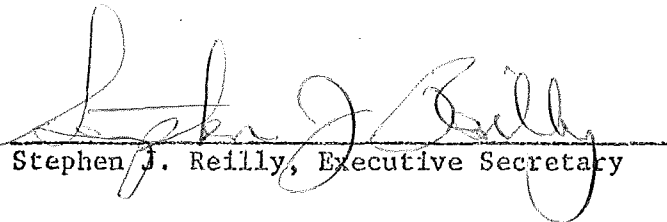
STATE OF WISCONSIN)
) SS
DEPARTMENT OF INDUSTRY,)
LABOR AND HUMAN RELATIONS)

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Stephen J. Reilly, Executive Secretary of the Department of Industry, Labor and Human Relations, and custodian of the official records of said Department, do hereby certify that the attached rules to Wisconsin Administrative Code, Chapters 50-59, Building and Heating, Ventilating & Air Conditioning, were adopted by the Department of Industry, Labor and Human Relations on June 14, 1971.

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 14 day of June, A.D., 1971.


Stephen J. Reilly, Executive Secretary

ORDER OF
DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS

Pursuant to authority vested in the Department of Industry, Labor and Human Relations by Section 101.01 to 101.29 Wis. Stats., the Department of Industry, Labor and Human Relations hereby amends, repeals, recreates and adopts rules of Wisconsin Administrative Code Chapters 50-59, Building and Heating, Ventilating and Air Conditioning.

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

Subsections Ind 51.001(2) intro. par.; (3)(a); (4); (7) and (8) are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(2) All exterior and inner court walls shall be of not less than 4-hour fire-resistive construction, as specified in section Ind 51.05, except that non-load bearing exterior walls which face streets, alleys, outer or inner courts 20 feet or more in width may be constructed of incombustible panels of not less than 1-hour fire-resistive construction.

~~(3) Interior partitions shall be constructed of incombustible materials, except that dividing partitions in stores, offices, and similar places not exceeding 3,000 square feet in area, occupied by one tenant only, may be constructed of wood panels or similar light construction.~~

(a) Partitions entirely within apartments having a floor area of not more than 800 square feet shall be of 1-hour fire-resistive construction but such partitions may be constructed with wood studs as specified in section Ind 51.05. Doors in such partitions may be wood panel doors.

(4) Enclosures for elevator or dumbwaiter shafts, vent shafts, stair wells, waste paper chutes and other similar vertical shafts shall be of 2-hour fire-resistive construction as specified in section Ind 51.05, with all interior openings therein protected by fire-resistive doors or windows as specified in section Ind 51.09.

(7) Floor construction shall consist of any approved floor system providing not less than 3-hour fire-resistive construction for all buildings more than 8 stories or 85 feet in height; and providing not less than 2-hour fire-resistive construction, for buildings which are 8 stories or 85 feet or less in height. All such fire-resistive protection shall be as specified in section Ind 51.06.

(8) Roofs shall be constructed as specified for floors, except that wood sheathing of not less than 2 inch nominal thickness may be used for buildings not more than 8 stories or 85 feet in height when all of such sheathing is more than 25 feet distant from any floor, balcony or gallery, or wood sheathing of not less than 1 inch nominal thickness may be used at any distance not exceeding 5 feet from a 2-hour fire-resistive attic floor, and when such sheathing is covered on the outside by a fire-retardant roof covering, except as provided under occupancy requirements.

Subsections Ind 51.001(2) intro par.; (3)(a); (4); (7) and (8) are created to become effective January 1, 1972.

(2) All exterior and inner court walls shall be of not less than 4-hour fire-resistive construction, as specified in section Ind 51.04, except that nonload bearing exterior walls which face streets, alleys, outer or inner courts 20 feet or more in width may be constructed of noncombustible panels of not less than 1-hour fire-resistive construction.

~~(3) Interior partitions shall be constructed of incombustible materials, except that dividing partitions in stores, offices, and similar places not exceeding 3,000 square feet in area, occupied by one tenant only, may be constructed of wood panels or similar light construction.~~

(a) Partitions entirely within apartments having a floor area of not more than 800 square feet shall be of 1-hour fire-resistive construction but such partitions may be constructed with wood studs as specified in section Ind 51.04. Doors in such partitions may be wood panel doors.

(4) Enclosures for elevator or dumbwaiter shafts, vent shafts, stairwells, waste paper chutes and other similar vertical shafts shall be of 2-hour fire-resistive construction as specified in section Ind 51.04 with all interior openings therein protected by fire-resistive doors or windows as specified in section Ind 51.047.

(7) Floor construction shall consist of any approved floor system providing not less than 3-hour fire-resistive construction for all buildings more than 8 stories or 85 feet in height; and providing not less than 2-hour fire-resistive construction, for buildings which are 8 stories or 85 feet or less in height. All such fire-resistive protection shall be as specified in section Ind 51.04.

(8) Roofs shall be constructed as specified for floors, except that wood sheathing of not less than 2 inch nominal thickness may be used for buildings not more than 8 stories or 85 feet in height when all of such sheathing is more than 25 feet distant from any floor, balcony or gallery, or wood sheathing of not less than 1 inch nominal thickness may be used at any distance not exceeding 5 feet from a 2-hour fire-resistive attic floor, and when such sheathing is covered on the outside by a class "A" or equal fire-retardant roof covering, except as provided under occupancy requirements.

Subsections Ind 51.01(2) intro. par.; (7) and (8) are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(2) Exterior and court walls shall be 2-hour fire-resistive construction as specified in section Ind 51.05, except that non-load bearing exterior walls which face streets, alleys, outer or inner courts 20 feet or more in width may be constructed of incombustible panels of not less than 1-hour fire-resistive construction.

(7) Roof construction shall be as specified for floors, except that the minimum nominal thickness shall be 2 inches. Roof coverings shall be a fire-retardant roofing as specified in section Ind 51.07 and shall be required over all combustible roof construction.

(8) Enclosures for elevator or dumbwaiter shafts, vent shafts, stair wells, wastepaper chutes, and other similar vertical shafts shall be of 2-hour fire-resistive construction as specified in section Ind 51.05, with all interior openings therein protected by fire-resistive doors as specified in section Ind 51.09.

Subsections Ind 51.01(2) intro. par.; (7) and (8) are created to become effective January 1, 1972.

(2) Exterior and court walls shall be 2-hour fire-resistive construction as specified in section Ind 51.04, except that nonload bearing exterior walls which face streets, alleys, outer or inner courts 20 feet or more in width may be constructed of noncombustible panels of not less than 1-hour fire-resistive construction.

(7) Roof construction shall be as specified for floors, except that the minimum nominal thickness shall be 2 inches. Roof coverings shall be class "A" or equal fire-retardant roofing as specified in section Ind 51.04 and shall be required over all combustible roof construction.

(8) Enclosures for elevator or dumbwaiter shafts, vent shafts, stairwells, wastepaper chutes, and other similar vertical shafts shall be of 2-hour fire-resistive construction as specified in section Ind 51.04, with all interior openings therein protected by fire-resistive doors as specified in section Ind 51.047.

History: 1-2-56; am. (2); (2) (a); Register, June, 1956, No. 6, eff. 7-1-56; r. and recr. Register, September, 1959, No. 45, eff. 10-1-59; am. (2) intro. par., (7) and (8), Register, February, 1971, No. 182, eff. 7-1-71.

Subsections Ind 51.02(1) intro. par.; (3) and (5) are repealed and recreated effective August 1, 1971 and expiring January 1, 1972, and (6) is repealed

Ind 51.02 Ordinary construction. (1) A building is of ordinary construction if all enclosing walls are constructed entirely of incombustible material, and the roof has a fire-retardant covering as specified in section Ind 51.07.

(3) Floors, roof and partitions may be of wood but no joist, rafter, or stud shall be less than 2 inches in nominal thickness. In buildings of 4 stories or more in height, the lower side of all metal or wood floor or roof construction shall be protected by a ceiling of one-hour fire-resistive construction as specified in section Ind 51.06, unless otherwise provided under the occupancy requirements.

(5) Bays, oriels and similar projections from the walls shall be constructed of incombustible materials as specified in this section. Penthouses and other roof structures shall be of not less than one-hour fire-resistive construction as specified in section Ind 51.06.

Subsections Ind 51.02(1) intro. par.; (3); (5) and (6) are created to become effective January 1, 1972.

Ind 51.02 Ordinary construction. (1) A building is of ordinary construction if all enclosing walls are constructed entirely of noncombustible material, and the roof has a class "B" or equal fire-retardant covering as specified in section Ind 51.04.

(3) Floors, roof and partitions may be of wood but no joist, rafter, or stud shall be less than 2 inches in nominal thickness. In buildings of 4 stories or more in height, the lower side of all metal or wood floor or roof construction shall be protected by a ceiling of 1-hour fire-resistive construction as specified in section Ind 51.04, unless otherwise provided under the occupancy requirements.

(5) Bays, oriels and similar projections from the walls shall be constructed of noncombustible materials as specified in this section. Penthouses and other roof structures shall be of not less than 1-hour fire-resistive construction as specified in section Ind 51.04.

(6) Roof coverings shall be class "B" or equal.

History: 1-2-56; r. and recr. Register, September, 1959, No. 45, eff. 10-1-59; am. (1), (3) and (5), and cr. (6), Register, February, 1971, No. 182, eff. 7-1-71.

R eff Aug 1-1971 added

Subsection Ind 51.03(2) is created to become effective January 1, 1972.

(2) Roof coverings shall be class "C" or equal.

History: 1-2-56; cr. (2), Register, February, 1971, No. 182, eff. 7-1-71.

Sections Ind 51.04 through 51.07 are created effective August 1, 1971 and expiring January 1, 1972.

NOTE: SECTIONS IND 51.04 THROUGH 51.07 ARE REPEALED EFFECTIVE JANAUARY 1, 1972. SEE SPECIAL NOTICE SECTION FOLLOWING SECTION IND 51.07.

Ind 51.04 Fire-resistive standards; structural members. (1) MINI-MUM THICKNESS IN INCHES FOR VARIOUS FIRE-RESISTIVE MATERIALS.

MINIMUM THICKNESS IN INCHES FOR VARIOUS FIRE-RESISTIVE MATERIALS

| Struct. Steel Parts to be Protected | Fire Resistive Material Used | Minimum Thickness of Material in Inches for the Following Fire-Resistive Periods | | | |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------|---------------------|---------------|
| | | 4 Hr. | 3 Hr. | 2 Hr. | 1 Hr. |
| Steel or Cast Iron Columns: All Members of Primary Trusses or Primary Girders | Concrete | 2 | 2 | 1½ | 1 |
| | Gunite | 2 | 1½ | 1 | ¾ |
| | Brick of Clay, Shale, Concrete or Sand Lime All Spaces Filled | 3¾ | 3¾ | 2¾ | 2¾ |
| | Clay Tile or Haydite or Waylite or Concrete Block or Gypsum Block or Poured Gypsum. All Spaces Filled. Metal Ties in Horizontal Joints | 2 Thicknesses 2 Inches Each | 4 | 2 | 2 |
| | Portland Cement Plaster on Metal Lath | ----- | ----- | 1½ with ½ air space | 1 |
| | Clay Tile, End Const. have less than 26% Voids with all Spaces Filled and Metal Ties in Horizontal Joints | 3¾ | 3¾ | 1¾ No Filling | 1¾ No Filling |
| Webs and Flanges of Steel Beams and Secondary Girders | Concrete | 2 | 2 | 1½ | 1 |
| | Gunite | 2 | 1½ | 1 | ¾ |
| | Brick of Clay, Shale, Concrete or Sand Lime | 2¾ | 2¾ | 2¾ | 2¾ |
| | Clay Tile, Concrete Block, Gypsum Block or Poured Gypsum | 2 | 2 | 2 | 2 |
| | Metal Lath and Gypsum or Portland Cement Plaster | ----- | ----- | 1½ | 1 |
| Reinforcing Steel in Columns, Beams Girders & Trusses | Concrete | 1½ | 1½ | 1½ | 1 |
| Reinforcing Steel in Reinforced Concrete Joists | Concrete | 1½ | 1½ | 1 | ¾ |
| Reinforcing Steel in Reinforced Concrete Slabs | Concrete | 1 | 1 | ¾ | ¾ |
| Reinforcing Steel in Reinforced Concrete Slabs | Gypsum | 1 | 1 | ¾ | ¾ |

(2) CONCRETE. Concrete shall have a coarse aggregate of limestone, calcareous gravel, traprock, blast furnace slag, burnt clay, burnt shale or other coarse aggregates containing not more than 65% of siliceous material such as granite, sandstone, chert, flint or quartz.

(3) APPROVAL OF OTHER MATERIALS. Other materials, assemblies and thicknesses of necessary strength and durability for the use intended and which have successfully performed under tests made by a recognized laboratory in accordance with the requirements of the "Standard Specifications for Fire Tests of Building Construction and Materials" (C19-33) of the American Society for Testing Materials, shall be accepted for specific ratings in addition to those prescribed in this section.

History: 1-2-56; r. Register, February, 1971, No. 182, eff. 7-1-71.

Ind 51.05 Fire-resistive standards; walls and partitions.

| (1) Wall Construction | Minimum Thickness in Inches, Face to Face | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------|-------------|-------------|
| | 4 Hr. | 3 Hr. | 2 Hr. | 1 Hr. |
| Solid Brick, Load Bearing, Unplastered | 8 | 8 | 8 | 8 |
| Solid Brick, Non-Load Bearing, Unplastered | 8 | 8 | 4 | 4 |
| Solid Brick, Load Bearing, Plastered Two Sides | 8 | 8 | 8 | 8 |
| Solid Brick, Non-Load Bearing, Plastered Two Sides | 8 | 8 | 4 | 4 |
| Hollow Clay Tile, Load Bearing, Unplastered | 12 4-Cell | 12 3-Cell | 8 3-Cell | 8 2-Cell |
| Hollow Clay Tile, Non-Load Bearing, Unplastered | 12 4-Cell | 8 3-Cell | 6 2-Cell | 4 1-Cell |
| Hollow Clay Tile, Load Bearing, Plastered Two Sides | 12 3-Cell | 8 3-Cell | 8 2-Cell | 8 2-Cell |
| Hollow Clay Tile, Non-Load Bearing, Plastered Two Sides | 12 3-Cell | 8 3-Cell | 4 1-Cell | 8 1-Cell |
| Concrete Block, Load Bearing, Unplastered | 12 | 12 | 8 | 8 |
| Concrete Block, Non-Load Bearing, Unplastered | 12 | 12 | 6 | 4 |
| Concrete Block, Load Bearing, Plastered Two Sides | 12 | 8 | 8 | 8 |
| Concrete Block, Non-Load Bearing, Plastered Two Sides | 12 | 8 | 4 | 3 |
| Solid Plain Concrete, Load Bearing | 8 | 8 | 8 | 6 |
| Solid Plain Concrete, Non-Load Bearing | 8 | 6 | 4 | 4 |
| Solid Reinforced Concrete, Load Bearing | 6 | 5 | 4 | 4 |
| Solid Reinforced Concrete, Non-Load Bearing | 6 | 5 | 4 | 3 |
| Solid Gypsum Block, Non-Load Bearing, Unplastered | 6 | 6 | 3 | 3 |
| Solid Gypsum Block, Non-Load Bearing, Plastered Two Sides | 6 | 4 | 3 | 3 |
| Hollow Gypsum Block, Non-Load Bearing, Unplastered | 8 | 8 | 4 | 4 |
| Hollow Gypsum Block, Non-Load Bearing, Plastered Two Sides | 8 | 8 | 4 | 4 |
| Solid Cement or Gypsum Plaster on Metal Base, Non-Load Bearing | ----- | ----- | 2 | 2 |
| Hollow Partitions, Lath and Plaster shall have a minimum thickness of 5/8 inch. Lath may be of metal or 3/4 inch perforated gypsum. If constructed of wood studs, they shall be fire-stopped. | ----- | ----- | ----- | 5 |

(2) Other materials, assemblies and thicknesses of necessary strength and durability for the use intended and which have successfully performed under tests made by a recognized laboratory in accordance with the requirements of the "Standard Specifications for Fire Tests of Building Construction and Materials" (C19-33) of the American Society for Testing Materials, shall be accepted for specific ratings in addition to those prescribed in this section.

(3) Thicknesses as established in this section shall be construed as establishing minimum requirements for fire-resistance and shall not preclude the application of other requirements of this code where considerations of strength, durability or stability require greater thicknesses.

(4) Where plaster is required in this section it shall have a minimum thickness of 1/2 inch except that for hollow partitions the thickness shall be not less than 3/4 inch. Either Portland cement or gypsum plaster may be used.

Ind 51.06 Fire-resistive floor construction. (1) Fire-resistive floor construction shall be accepted for the following respective degrees of fire-resistive protection when constructed as specified in this section. They shall be constructed entirely of incombustible materials.

(2) FOUR-HOUR CONSTRUCTION. Four-hour fire-resistive floor construction shall consist of reinforced concrete, gypsum or solid masonry slabs or arches not less than 4 inches in thickness, or shall consist of hollow masonry slabs or arches not less than 4 inches in thickness with a top covering of not less than 2 inches of solid masonry, or shall consist of steel joists or steel floor construction protected with fire-resistive materials as tabulated in this section. Except in the case of steel joisted construction, all reinforcing, tie rods and supporting structural members in such floors shall be protected with not less than 4-hour fire-resistive construction as specified in section Ind 51.04.

(3) THREE-HOUR CONSTRUCTION. Three-hour fire-resistive floor construction shall consist of reinforced concrete, gypsum or solid masonry slabs or arches not less than 2½ inches in thickness, or shall consist of hollow masonry slabs or arches not less than 4 inches in thickness with a top covering of solid masonry not less than 1½ inches in thickness, or shall consist of steel joists or steel floor construction protected with fire-resistive materials as tabulated in this section. Except in the case of steel joisted construction all reinforcing, tie rods and supporting structural members in such floor construction shall be protected with not less than 3-hour fire-resistive construction as specified in section Ind 51.04.

(4) TWO-HOUR CONSTRUCTION. Two-hour fire-resistive floor construction shall consist of reinforced concrete, gypsum or solid masonry slabs or arches not less than 2½ inches in thickness, or shall consist of hollow masonry slabs or arches not less than 3 inches in thickness with a top covering of not less than one inch of solid masonry, or shall consist of steel joists or steel floor construction protected with fire-resistive materials as tabulated in this section. Except in the case of steel joisted construction all reinforcing, tie rods and

not less than ¾ inch thick, the required slab thickness may be reduced ½ inch but in no case shall be less than 2½ inches thick.

Ind 51.07 Fire retardant roof coverings. (1) Fire-retardant roof coverings have no time resistance ratings by governmental testing laboratories. The Underwriters' Laboratories in their "List of Inspected Fire Protection Equipment and Materials" classifies their degree of fire-resistance by the letters A, B and C. Class A roof coverings have the highest resistance and Class C the lowest.

(2) Roof coverings on buildings of fire-resistive and mill construction shall be not less than Class A, or equal, those on buildings of ordinary construction shall be not less than Class B, or equal, and those on frame buildings shall be not less than Class C, or equal.

(3) The department of industry, labor and human relations will accept roof coverings for different fire-resistance values as established by, and if installed according to, the requirements of the Underwriters' Laboratories.

Note: The Underwriters' Laboratories "List of Inspected Materials" is obtainable from the Fire Insurance Rating Bureau and Fire Insurance Agencies.

(4) The department of industry, labor and human relations will approve, subject to the provisions of this section, any roof covering which has developed the required fire-resistance in tests as specified in the "Standard Specifications of Fire Tests of Building Construction and Materials" (A.S.T.M. Designation C19-33) when conducted by a nationally recognized testing laboratory.

*Continued
of a page*

- 10 -

Rafferty

Sections Ind 51.04 through 51.048, are created to become effective January 1, 1972.

SPECIAL NOTICE!

THE FOLLOWING RULES FOR "FIRE-RESISTIVE STANDARDS FOR MATERIALS OF CONSTRUCTION," SECTIONS IND 51.04 THROUGH IND 51.048, WILL BECOME EFFECTIVE JANUARY 1, 1972.

Fire-Resistive Standards
for
Materials of Construction

Ind 51.04 Scope. This section shall include standards applicable to various types of fire-resistive construction. Requirements established herein are considered minimum safety standards and will not necessarily result in the most advantageous insurance rates.

History: Cr. Register, February, 1971, No. 182, eff. 7-1-71.

Ind 51.041 Definitions. (1) **APPROVED.** Means approval granted by the department of industry, labor and human relations.

(2) **AUTOMATIC.** Automatic as applied to a fire protective device, is one which functions without human intervention and is actuated as a result of the predetermined temperature rise, rate of rise of temperature, combustion products or smoke density such as an automatic sprinkler system, automatic fire door, automatic fire shutter, or automatic fire vent.

(3) **CEILING PROTECTION.** The fire protection membrane suspended beneath the floor or ceiling construction which, when included with the construction, develops the fire-resistive rating for the overall assembly.

(4) **COMBUSTIBLE CONSTRUCTION.** An assembly such as a wall, floor or roof having components of combustible material.

(5) **CLOSING DEVICE (FIRE DOOR).** A closing device is one which will close the door, and be adequate to latch and/or hold hinged or sliding door in a closed position.

(a) *Automatic.* An automatic closing device is one which functions without human intervention, and is actuated as a result of the predetermined temperature rise, rate of rise of temperature, combustion products or smoke density.

(b) *Self-closing.* A self-closing device is one which will maintain the door in a closed position.

(6) **COMBUSTIBLE MATERIAL.** All materials not classified as "non-combustible" are considered combustible. This property of a material does not relate to its ability to structurally perform under fire exposure. The degree of combustibility is not defined by standard fire test procedures.

(7) **DEPARTMENT.** Means the department of industry, labor and human relations.

(8) **FIRE DOOR.** A door so constructed as to give protection against the passage of fire.

(9) **FIRE DOOR ASSEMBLY.** The assembly of fire door and its accessories, including all hardware, frames, closing devices and their anchors, so constructed as to give protection against the passage of fire.

(10) FIRE-RESISTIVE CLASSIFICATION. Fire-resistive classification is the time in hours during which a material or assembly continues to exhibit fire resistance under conditions of tests and performance as specified in ASTM E-119, ASTM E-152 and ASTM E-163.

(11) FIRE-RESISTIVE RATING. Refer to fire-resistive classification.

(12) FIRE RESISTANCE AND FIRE-RESISTIVE MATERIAL. Having the property to withstand fire or give protection from it. As applied to elements of building, it is characterized by the ability to confine a fire or to continue to perform a given structural function, or both.

(13) FIRE-RESISTIVE PROTECTION. An insulating material applied directly, attached to, or suspended from a structural assembly, to maintain the structural integrity of a member or system for the specified time rating.

(14) FIRE-RESISTIVE PROTECTION, DIRECTLY APPLIED. A coating material applied directly to the structural element for the purpose of fire protection.

(15) FIRE-RETARDANT ROOF COVERINGS. Roof coverings shall be classified on the basis of protection provided against fire originating outside the building or structure on which they have been installed.

(a) Class A roof coverings are those which are effective against severe fire exposures (meeting the three methods for fire tests of class A roof coverings (ASTM Standard E-108)) and possess no flying brand hazard.

(b) Class B roof coverings are those which are effective against moderate fire exposures (meeting the three methods for fire tests of class B roof coverings (ASTM Standard E-108)) and possess no flying brand hazard.

(c) Class C roof coverings are those which are effective against light fire exposures (meeting the three methods for fire tests of class C roof coverings (ASTM Standard E-108)) and possess no flying brand hazard.

(16) FIRE RETARDANT—TREATED WOOD. Fire-retardant wood includes lumber or plywood that has been treated with a fire-retardant chemical to provide classifications (flame-spread (FSC) and fuel contributed (FCC)) of 25 or less by ASTM method E-84, shows no progressive combustion during 30 minutes of fire exposure by this method, and is so labeled. Fire-retardant wood for decorative and interior finish purposes provides reduced flame-spread classification (FSC) by ASTM method E-84 as specified by the code for materials used in the particular applications.

(17) FIRE WINDOW ASSEMBLY. A fire window includes glass, frame, hardware and anchors constructed and glazed to give protection against the passage of flame.

(18) FLAME-SPREAD CLASSIFICATION. Flame-spread classification (FSC) is a comparative rating of the measure of flame-spread on a surface of a material or assembly as determined under conditions of tests and performance as specified in ASTM E-84.

(19) FLAME-SPREAD RATING. Refer to flame-spread classification.

(20) FUEL CONTRIBUTED CLASSIFICATION. Fuel contributed classification (FCC) is a comparative measure of the fuel contribution of a material or an assembly in the flame-spread test per ASTM E-84.

(21) NONCOMBUSTIBLE CONSTRUCTION. An assembly such as a wall, floor or roof having components of noncombustible material.

(22) NONCOMBUSTIBLE MATERIAL. A noncombustible material is one which, in the form in which it is used, meets one of the requirements 1., 2. or 3. listed below. Materials used adjacent to or in contact with heat-producing appliances, warm air ducts, plenums and chimneys shall be classified as noncombustible only on the basis of requirement 1. Noncombustible does not apply to the flame-spread characteristics of interior finish or trim materials. No material shall be classed as noncombustible building construction material which is subject to increase in combustibility or flame-spread classification (FSC) beyond the limits herein established through the effects of age, moisture or other atmospheric conditions.

1. Materials which pass the test procedure of ASTM E-136 for defining noncombustibility of elementary materials when exposed to a furnace temperature of 1,382 degrees F. for a minimum period of 5 minutes, and do not cause a temperature rise of the surface or

interior thermocouples in excess of 54 degrees F. above the furnace air temperature at the beginning of the test and which do not flame after an exposure of 30 seconds.

2. Materials having a structural base of noncombustible material as defined in paragraph 1., with a surfacing not more than 1/8 inch thick which has a flame-spread classification (FSC) not greater than 50 when tested in accordance with the method of test for surface burning characteristics of building materials (ASTM E-84).

3. Materials other than defined in paragraphs 1. and 2., having a flame-spread classification (FSC) not greater than 25 without evidence of continued progressive combustion, and of such composition that surfaces that would be exposed by cutting through the material in any way would not have a flame-spread classification (FSC) greater than 25 when tested in accordance with the method of test for surface burning characteristics of building materials (ASTM E-84).

(23) RESTRAINED SUPPORT. A flexural member where the supports and/or the adjacent construction provides complete or partial restraint against rotation of the ends of the member and/or partial restraint against horizontal displacement when subject to a gravity load and/or temperature change.

(24) SIMPLE SUPPORT. A flexural member where the supports and/or the adjacent construction allows free rotation of the ends of the member and horizontal displacement when subject to a gravity load and/or a temperature change.

History: Cr. Register, February, 1971, No. 182, eff. 7-1-71.

Ind 51.042 General requirements. (1) Construction details and quality of material used for these systems must be those used by the testing laboratory for the test, and/or those dictated by good construction practice.

(2) Connection of structural members. (a) The minimum fire-resistive protection of a connection shall be equal to the maximum required for the members to which it is attached.

(3) For structural components with a fire-resistive rating obtained by test with restrained ends, the supporting structure shall be designed to provide for this restraint.

(4) ASTM standard methods of test. (a) All products manufactured and tested according to ASTM standard methods prior to effective dates of standards specified in "Fire-Resistive Standards for Materials of Construction" shall be accepted unless the ASTM standard method used in the test is judged to be inadequate in comparison with the currently adopted standard method.

(5) The heat transmission requirements of ASTM E-119 (25b), with the exception of high hazard areas, penal and health care facilities and warehouses for combustible materials, may be reduced to one-half (1/2) of the hourly rating required by this code, but not less than one hour.

NOTE: For ASTM E-119 Standard adopted see Ind 51.25 (90).

(a) The fire-resistive rating for structural integrity required by this code shall be maintained where the heat transmission criteria has been reduced.

(6) The use of fire-resistive protection implies consent by owner to maintain material in a serviceable condition. Where this protection is concealed, provisions shall be made for periodic visual inspection of the structural insulating material at each story.

NOTE: Definition of owner—see 101.01 (13), Wis. Stats.

History: Cr. Register, February, 1971, No. 182, eff. 7-1-71.

Ind 51.043 Approved rating methods. (1) Ratings of fire-resistive assemblies shall be determined by one of the following methods:

(a) Test by approved testing laboratories (see Ind 51.044).

(b) Typical examples as listed in this code in lieu of approved test (see Ind 51.045).

(c) Approved method of calculation in lieu of approved test (see Ind 51.046).

History: Cr. Register, February, 1971, No. 182, eff. 7-1-71.

Ind 51.044 Approved testing laboratories. (1) Fire rating tests conducted according to table 1 listed ASTM standards shall be acceptable if conducted by the recognized testing laboratory for referenced test.

NOTE: Other testing laboratories will be recognized as an approved agency if accepted in writing by the department.

TABLE 1

| Name of Recognized Laboratories | ASTM Standard Tests | | | | | |
|-----------------------------------------------------|---------------------|-------|-------|-------|-------|-------|
| | E-84 | E-108 | E-119 | E-136 | E-162 | E-163 |
| Forest Prod. Lab., Madison, Wis.* | | | X | | X | |
| Nat'l. Bureau of St'd., Washington, D.C. | | | X | X | | |
| Ohio State Univ., Columbus, Ohio | | | X | X | X | X |
| Portland Cement Assoc., Skokie, Ill. | | | X | | | |
| Southwest Research Inst., San Antonio, Tex. | X | | | | | |
| Underwriters' Lab., Inc., Chicago, Ill. | X | X | X | | X | X |
| Underwriters' Lab., Inc., Scarborough, Ont., Canada | X | X | X | X | X | X |
| Univ. of Calif., Berkeley, Calif. | | X | X | | | X |

*NOTE: Reference based on research and development data. Facility is not available for conducting routine rating tests.

NOTE: For column identification and specific standards adopted, see subsections Ind 51.25 (88) thru (93).

History: Cr. Register, February, 1971, No. 182, eff. 7-1-71.

Ind 51.045 Typical examples of Fire-Resistive Structural Components. (1) Basic design and construction for specified fire-resistive protection of structural components listed in table 2, including references (a) through (p), shall be acceptable.

NOTE: The following table is based on performance, interpretation of various test data and/or data from ASTM E-119 test (see table 2).

(a) Types of concrete.

1. Type I—normal weight concrete with limestone, calcareous gravel and air-cooled slag aggregate.

2. Type II—normal weight concrete with siliceous gravel, granite or quartz aggregate containing more than 40% quartz, chert or flint. Values given for type I apply except where values are tabulated for type II.

3. Type III—lightweight aggregate with expanded slag, shale or clay aggregate. Includes sanded—lightweight concretes not over 115 lbs. per cu. ft. oven-dried density.

(b) Cover on reinforcing steel is for sides and bottoms. Where tensile reinforcing elements have different cover, the tabulated cover is the average of the minimum values of the individual elements. The cover of an individual element shall not be less than ½ the tabulated value. Top cover to be a minimum of ¼ inch.

(c) For the heat transmission requirements of floor and roof construction, the thickness of the top slab may be reduced if non-combustible insulation is directly applied to either side of the slab and provided the U-factor is equaled or reduced.

(d) The thickness of top slab is in accordance with ASTM E-119 heat transmission requirements. For variations in thickness of top slab see section Ind 51.042 (5).

NOTE: For ASTM E-119 standard adopted see Ind 51.25 (90).

(e) Longitudinal joints between individual precast floor or roof units, or individual wall units shall be installed as tested or shall be grouted solid for the thickness required by the fire-resistive rating. Noncombustible insulation may be substituted for the grout if the U-factor is equaled or reduced providing the integrity of insulation remains as installed. The topping used in floor or roof units may be included.

(f) Type I Hollow Masonry is a masonry with calcareous or siliceous aggregate. Type II Hollow Masonry is a masonry with expanded slag, clay, shale or pumice aggregate.

(g) Equivalent thickness = $\frac{\text{Total volume minus volume of voids}}{\text{length times height}}$

(h) t_e -equivalent thickness = $\frac{\text{Total conc. area minus area of void}}{\text{width}}$

(i) Clay, shale, concrete or sand lime—with less than 25% voids or with all spaces filled.

(j) 1½ inch space between column and masonry unit—no fill required.

(k) For restrained conditions, thickness of fire protection may be reduced if substantiated by test data or calculation method.



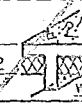












(l) Elements with this minimum size are recognized for heavy timber construction, acceptable for certain buildings in lieu of one hour noncombustible construction.

(m) Where combustible members are framed into a wall, the wall shall be of such thickness or be so constructed that the fire barrier between the member and the opposite face of the wall, or between adjacent members set in from opposite sides will be 93% of the equivalent thickness shown in table 2.

TYPICAL EXAMPLES OF FIRE RESISTIVE ST

| TYPE OF CONSTRUCTION | | Row NO. | STRUCTURAL COMPONENTS | SKETCHES |
|--------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------|
| COMPONENTS WITH SUSPENDED OR ATTACHED PROTECTION | CONC. | 17. | CONCRETE JOISTS OR WAFFLE | |
| | | 18. | STEEL COLUMNS | |
| | STEEL FRAMING | 19. | STEEL GIRDERS... BEAMS... TRUSSES... JOISTS, COLUMNS INDIVIDUALLY PROTECTED | |
| | | 20. | STEEL BEAMS, GIRDERS, TRUSSES & JOISTS... W/CEILING PROTECTION & MINIMUM 2 1/2" TH. TYPE I, II OR III CONCRETE SLAB (C) (C) (C) | |
| | | 21. | STEEL STUD PARTITION NON BEARING | |
| | | 22. | WOOD JOISTS MIN. 2" X 10" WOOD FLOOR ATTACHED CEILING | |
| | COMBUSTIBLE CONSTRUCTION | 23. | WOOD JOISTS MIN. 2" X 10", WOOD FLOOR SUSPENDED CEILING | |
| | | 24. | WOOD STUD PARTITION MIN. 2" X 4" STUD | |
| | | | | |
| | HEAVY TIMBER SOLID OR LAMINATED | 25. | COLUMNS | |
| 26. | | GIRDERS & BEAMS | | |
| 27. | | ARCH & TRUSS FOR ROOF ONLY | | |
| 28. | | FLOOR & ROOF DECK | | |

TYPICAL EXAMPLES OF FIRE RESISTIVE

| TYPE OF CONSTRUCTION | | R ₀ W NO. | STRUCTURAL COMPONENTS | SKETCHES |
|---------------------------------------|---------------------------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| COMPONENTS WITHOUT APPLIED PROTECTION | CONCRETE CAST IN PLACE AND PRECAST | 1. | COLUMNS |  |
| | | 2. | GIRDERS AND BEAMS |  |
| | | 3. | JOISTS & WAFFLES WITHOUT FILLERS OR PARTIAL FILLERS OF TYPE I OR II MASONRY OR CLAY TILE |  |
| | | 4. | SLABS OR JOISTS & WAFFLES WITH TYPE I OR II MASONRY OR CLAY TILE FILLER |  |
| | | 5. | WALLS AND PARTITIONS BRG. & NON-BRG. |  |
| | CONCRETE PRECAST & CAST IN PLACE POSTENSIONED OR PRETENSIONED SIMPLE SPAN | 6. | GIRDERS AND BEAMS |  |
| | | 7. | JOISTS AND WAFFLES |  |
| | | 8. | SINGLE TEE |  |
| | | 9. | MULTI-TEE UNITS |  |
| | | 10. | SOLID & CORED SLABS |  |
| | MASONRY BEARING AND NON BEARING | 11. | UNREINFORCED CONCRETE WALLS & PARTITIONS |  |
| | | 12. | HOLLOW MASONRY WALLS & PARTITIONS...BLOCK TILE CORED BRICKS CAVITY WALLS |  |
| | | 13. | SOLID MASONRY BRICK BLOCK...CLAY TILE WITH LESS THAN 25% VOIDS OR WITH THE CORES FILLED |  |
| COMPONENTS WITH APPLIED PROTECTION | STEEL | 14. | COLUMNS |  |
| | | | GIRDERS...BEAMS...TRUSSES |  |

TYPICAL EXAMPLES OF FIRE RESISTIVE STRUCTURAL COMPONENTS, TABLE 2

| TYPE OF CONSTRUCTION | R ₀ W NO. | STRUCTURAL COMPONENTS | SKETCHES | INSULATING MATERIAL | DESCRIP-TION | MINIMUM REQUIREMENTS | | | | | | | | | | | | | | |
|---------------------------------------|--------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------|----------------------|------------------------------------------------|-----------------------------|-------------|----------|-----------------|--------------|-------------|--------------|-----------------|--------------|-------|-------|----|-----|
| | | | | | | 4 HR. | | | 3 HR. | | | 2 HR. | | | 1 HR. | | | | | |
| | | | | | | I | II | III | I | II | III | I | II | III | I | II | III | | | |
| COMPONENTS WITH APPLIED PROTECTION | CONCRETE CAST IN PLACE AND PRECAST | 1. | COLUMNS | | CONCRETE TYPE I II & III ⓐ ⓑ | REINF. COVER | 2 | 2 | 2 | 2 | 2 | 2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | | |
| | | 2. | GIRDERS AND BEAMS | | CONCRETE TYPE I II & III ⓐ ⓑ ⓓ | REINF. COVER | 2 | 2 | 2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 1 | 1 | 1 | | |
| | | 3. | JOISTS & WAFFLES WITHOUT FILLERS OR PARTIAL FILLERS OF TYPE I OR II MASONRY OR CLAY TILE | | CONCRETE TYPE I II & III ⓐ ⓑ ⓐ ⓓ ⓔ ⓓ ⓓ ⓓ | REINF. COVER | 1 | 1 | 1 | 1 | 1 | 1 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | | |
| | | 4. | SLABS OR JOISTS & WAFFLES WITH TYPE I OR II MASONRY OR CLAY TILE FILLER | | CONCRETE TYPE I II & III ⓐ ⓑ ⓐ ⓓ ⓔ ⓓ ⓓ ⓓ | REINF. COVER | 1 | 1 | 1 | 1 | 1 | 1 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | | |
| | | 5. | WALLS AND PARTITIONS BR'G. & NON-BR'G. | | CONCRETE TYPE I II & III ⓐ ⓑ ⓐ | REINF. COVER | 1 | 1 | 1 | 1 | 1 | 1 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | | |
| COMPONENTS WITHOUT APPLIED PROTECTION | CONCRETE PRECAST CAST IN PLACE POSTTENSIONED OR PRETENSIONED SIMPLE SPAN | 6. | GIRDERS AND BEAMS | | CONCRETE TYPE I II & III ⓐ ⓑ ⓓ | AVE. COVER (w) | I & II 3 1/2 | III 3 | I & II 3 | III 3 | I & II 2 1/2 | III 2 3/4 | I & II 2 | III 2 1/4 | I & II 1 3/4 | III 1 3/4 | | | | |
| | | 7. | JOISTS AND WAFFLES | | CONCRETE TYPE I II & III ⓐ ⓑ ⓐ ⓓ ⓔ ⓓ ⓓ ⓓ | AVE. COVER | 3 1/2 | 3 | 3 | 3 | 2 3/4 | 2 1/2 | 2 | 2 | 1 3/4 | 1 3/4 | | | | |
| | | 8. | SINGLE TEE | | CONCRETE TYPE I II & III ⓐ ⓑ ⓐ ⓓ ⓔ ⓓ ⓓ ⓓ | AVE. COVER | 2 3/4 | 2 3/4 | 1 3/4 | 1 3/4 | 1 3/4 | 1 3/4 | 1 3/4 | 1 3/4 | 1 3/4 | 1 3/4 | | | | |
| | | 9. | MULTI-TEE UNITS | | CONCRETE TYPE I II & III ⓐ ⓑ ⓐ ⓓ ⓔ ⓓ ⓓ ⓓ | AVE. COVER | BY TEST OR LISTING | | | | 2 | 2 | 1 3/4 | 1 3/4 | 1 1/2 | 1 1/2 | | | | |
| | | 10. | SOLID & CORED SLABS | | CONCRETE TYPE I II & III ⓐ ⓑ ⓐ ⓓ ⓔ ⓓ ⓓ ⓓ | AVE. COVER | 6 3/4 | 7 | 5 1/2 | 5 3/4 | 6 1/4 | 4 3/4 | 4 3/4 | 5 | 3 3/4 | 3 1/4 | 2 3/4 | 2 3/4 | | |
| | | 11. | UNREINFORCED CONCRETE WALLS & PARTITIONS | | CONCRETE TYPE I II & III ⓐ ⓓ | WALL TH. (t) | 6 | 6 1/2 | 5 | 5 | 5 1/2 | 4 1/2 | 4 | 4 | 4 | 3 | 3 | | | |
| | | 12. | HOLLOW MASONRY WALLS & PARTITIONS...BLOCK TILE CORED BRICKS CAVITY WALLS | | MASONRY TYPE I MASONRY TYPE II ⓕ ⓐ ⓓ | EQUIV. THICK'S. | 6.7 | | | 5.7 | | | 4.5 | | | 3.0 | | | | |
| | | 13. | SOLID MASONRY BRICK BLOCK...CLAY TILE WITH LESS THAN 25% VOIDS OR WITH THE CORES FILLED | | MASONRY TYPE I & II CLAY, SHALE, CONCRETE, SAND OR LIME ⓓ | WALL TH. (t) | 8" | | | 8" | | | 8" | | | 4" | | | | |
| | | COMPONENTS WITH DIRECT APPLIED PROTECTION | STEEL | 14. | COLUMNS | | CONCRETE TYPE I II & III ⓐ ⓓ | THICKNESS OF (t) PROTECTION | I | II | III | I | II | III | I | II | III | I | II | III |
| | | | | 15. | GIRDERS...BEAMS...TRUSSES | | CONCRETE TYPE I II & III ⓐ ⓓ | THICKNESS OF (t) PROTECTION | I | II | III | I | II | III | I | II | III | I | II | III |
| 16. | COLUMNS...BEAMS...GIRDERS...TRUSSES...JOISTS & STEEL FLOOR UNITS | | | | SPRAYED FIBER...CEMENTITIOUS MIXTURE...INTUMESCENT PAINTS | | BY TESTS...OR LISTING BY APPROVED TESTING LAB. | | | | | | | | | | | | | |

TYPICAL EXAMPLES OF FIRE RESISTIVE STRUCTURAL COMPONENTS, TABLE 2 (CON'T.)

| TYPE OF CONSTRUCTION | R _o W NO. | STRUCTURAL COMPONENTS | SKETCHES | INSULATING MATERIAL | DESCRIP-TION | MINIMUM REQUIREMENTS | | | | | |
|--------------------------------------------------|--------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------|-------|--------------------------|--------------------------------------------|----------|
| | | | | | | 4 HR. | 3 HR. | 2 HR. | 1 HR. | | |
| COMPONENTS WITH SUSPENDED OR ATTACHED PROTECTION | CONC. | CONCRETE JOISTS OR WAFFLE | | ③ ④ ⑤ CONCRETE TYPE I, II OR III 3/4" COVER | t _s THICK OF SLAB | 3" | 2" | | | | |
| | | | | VERMICULITE...GYPSUM...OR PERLITE GYPSUM ON METAL LATH | t _i THICK OF INSULATION | 1" | 3/4" | | | | |
| | STEEL FRAMING | 18. | STEEL COLUMNS | | TYPE I & II MASONRY ① 1 1/2" AIR SPACE ① | THICK OF INSULATION | 4" SOLID | | | | |
| | | 19. | STEEL GIRDERS...BEAMS... TRUSSES...JOISTS, COLUMNS INDIVIDUALLY PROTECTED | | SPRAYED FIBRE...CEMENTITIOUS MIXTURE...LATH & PLASTER | | BY TESTS...OR APPROVED TESTING LAB. | | | BY | |
| | | 20. | STEEL BEAMS, GIRDERS, TRUSSES & JOISTS...W/CEILING PROTECTION & MINIMUM 2 1/2" TH. TYPE I, II OR III CONCRETE SLAB ③ ④ ⑤ | | SPRAYED FIBRE...CEMENTITIOUS MIXTURE...LATH & PLASTER ACOUSTICAL TILE | | BY TESTS...OR APPROVED TESTING LAB. | | | BY | |
| | | 21. | STEEL STUD PARTITION NON BEARING | | GYPSUM...PERLITE PLASTER ON PERFORATED GYP. LATH...2 1/2" STUD GYPSUM WALL BOARD...3 5/8" STUD | t _p PLASTER t _i LATH NO. LAYERS THICK, EACH | | | 3/4" / 3/8" | 1/2" / 3/8" | |
| | COMBUSTIBLE CONSTRUCTION | 22. | WOOD JOISTS MIN. 2" X 10", WOOD FLOOR ATTACHED CEILING | | GYPSUM WALL BOARD...2-2" X 10"s - 4'-0" @ 1/8" PLYWOOD FLOORING GYP. WALL BOARD...2" X 10"s 16" @ 1/2" PLYWOOD OR 1" X 6" T & G. SUB-FLRG | t _i INSUL. t _i INSUL. t _f FLOORING | * | | | 5/8" 5/8" PLYWOOD OR 1" X 3" T & G. | |
| | | 23. | WOOD JOISTS MIN. 2" X 10", WOOD FLOOR SUSPENDED CEILING | | NON COMBUSTIBLE 2" X 10" 16" @ ACOUSTICAL TILE W/ 5/8" PLYWOOD OR 1" X 4" T & G. SUB FLOORING | t _i INSUL. t _f FLOORING | | | | 5/8" 1/2" PLYWD OR 1" X 6" T & G. | |
| | | 24. | WOOD STUD PARTITION MIN. 2" X 4" STUD | | GYPSUM WALLBOARD | NO. LAYERS / TH. OF EACH | | | | TWO 5/8" | TWO 3/8" |
| | | | | | GYPSUM PERLITE PLASTER ON 3/8" GYPSUM LATH GYPSUM & SAND PLASTER ON U.L. LISTED WIRE LATH GYPSUM & VERMICULITE PLASTER ON METAL LATH | t _p t _i t _i | | | "PLASTER W/ 1" HEX. MESH | 9/16" | 3/4" |

① HEAVY TIMBER CONSTRUCTION TABLE

| | | | | | | | | | |
|---------------------------------|-------------------|----------------------------|------------------|------------------|---------------------------------|---|--|--|-------------------------------|
| HEAVY TIMBER SOLID OR LAMINATED | 25. | COLUMNS | | WOOD ALL SPECIES | FLOOR...WIDTH X DEPTH MIN. NOM. | * | | | 8" x 8" |
| | | | | | ROOF...WIDTH X DEPTH MIN. NOM. | * | | | 5" x 8" |
| | 26. | GIRDERS & BEAMS | | WOOD ALL SPECIES | MIN. WIDTH X DEPTH (NOM.) | | | | 6" x 10" |
| | 27. | ARCH & TRUSS FOR ROOF ONLY | | WOOD ALL SPECIES | MIN. WIDTH X DEPTH EACH MEMBER | * | | | 4" x 6" |
| 28. | FLOOR & ROOF DECK | | WOOD ALL SPECIES | ROOF | | | | | 2" T & G. OR 3" SOLID |
| | | | | FLOOR | | | | | 1" T & G. OR 1/2" SOLID |

Replaces February, 1971, No. 182 Building and heating, ventilating and air conditioning code

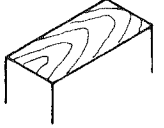
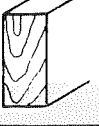
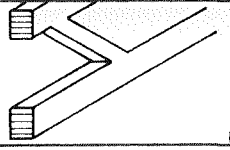

* Changes to be noted in row number 22, 25, 27 and 28.

(See page 17 for enlarged chart.)

TYPICAL EXAMPLES OF FIRE RESISTIVE STRUCTURAL COMPONENTS, TABLE 2 (CON'T.)

| TYPE OF CONSTRUCTION | ROW NO. | STRUCTURAL COMPONENTS | SKETCHES | INSULATING MATERIAL | DESCRIPTION | MINIMUM REQUIREMENTS | | | | |
|--------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------|-------|---------------------------|---------------------------------|------|
| | | | | | | 4 HR. | 3 HR. | 2 HR. | 1 HR. | |
| COMPONENTS WITH SUSPENDED OR ATTACHED PROTECTION | CONC. | CONCRETE JOISTS OR WAFFLE | | (a) (c) (d) CONCRETE TYPE I, II OR III 3/4" COVER VERMICULITE... GYPSUM... OR PERLITE GYPSUM ON METAL LATH | t's THICK OF SLAB t'i THICK OF INSULATION | 3" | 2" | | | |
| | STEEL FRAMING | STEEL COLUMNS | | TYPE I & II MASONRY (f) 1 1/2" AIR SPACE (j) | THICK OF INSULATION | 4" SOLID | | | | |
| | | STEEL GIRDERS... BEAMS... TRUSSES... JOISTS, COLUMNS INDIVIDUALLY PROTECTED | | SPRAYED FIBRE... CEMENTITIOUS MIXTURE... LATH & PLASTER | | BY TESTS... OR APPROVED TESTING LAB. | | | | BY |
| | | STEEL BEAMS, GIRDERS, TRUSSES & JOISTS... W/CEILING PROTECTION & MINIMUM 2 1/2" TH. TYPE I, II OR III CONCRETE SLAB (a) (c) (d) | | SPRAYED FIBRE... CEMENTITIOUS MIXTURE... LATH & PLASTER ACOUSTICAL TILE | | BY TESTS... OR APPROVED TESTING LAB. | | | | BY |
| | | STEEL STUD PARTITION NON BEARING | | GYPSUM... PERLITE PLASTER ON PERFORATED GYP. LATH... 2 1/2" STUD GYPSUM WALL BOARD... 3 5/8" STUD | t'p PLASTER t'i LATH NO. LAYERS THICK. EACH | | | 3/4" / 3/8" | 1/2" / 3/8" | |
| COMBUSTIBLE CONSTRUCTION | WOOD JOISTS MIN. 2" X 10", WOOD FLOOR ATTACHED CEILING | | GYPSUM WALL BOARD... 2-2" X 10"s - 4'-0" 9/16", 1/8" PLYWOOD FLOORING GYP. WALL BOARD... 2" X 10"s 16" 9/16" 1/2" PLYWOOD OR 1" X 6" T. & G. SUB-FLRG | t'i INSUL. t'i INSUL. t'f FLOORING | | | | 5/8" | 5/8" PLYWOOD OR 1" X 3" T. & G. | |
| | WOOD JOISTS MIN. 2" X 10", WOOD FLOOR SUSPENDED CEILING | | NON COMBUSTIBLE 2" X 10" 16" 9/16" ACOUSTICAL TILE W/5/8" PLYWOOD OR 1" X 4" T. & G. SUB FLOORING | t'i INSUL. t'f FLOORING | | | | 5/8" | 1/2" PLYWD OR 1" X 6" T. & G. | |
| | WOOD STUD PARTITION MIN. 2" X 4" STUD | | GYPSUM WALLBOARD GYPSUM PERLITE PLASTER ON 3/8" GYPSUM LATH | NO. LAYERS / TH. OF EACH tp | | | | TWO 5/8" | TWO 3/8" | |
| | | | GYPSUM & SAND PLASTER ON U.L. LISTED WIRE LATH GYPSUM & VERMICULITE PLASTER ON METAL LATH | tt tt | | | | 1" PLASTER W/1" HEX. MESH | 9/16" | 3/4" |

① HEAVY TIMBER CONSTRUCTION TABLE

| | | | | | | | | | |
|---------------------------------------------|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------|----------------------------------------|--|--|------------------------------------------------------------------------|----------|
| HEAVY TIMBER SOLID OR LAMINATED | 25. | COLUMNS |  | WOOD ALL SPECIES | FLOOR... WIDTH X DEPTH MIN. NOM. | | | | 8" X 8" |
| | | | | | ROOF... WIDTH X DEPTH MIN. NOM. | | | | 6" X 8" |
| | 26. | GIRDERS & BEAMS |  | WOOD ALL SPECIES | MIN. WIDTH X DEPTH (NOM.) | | | | 6" X 10" |
| | 27. | ARCH & TRUSS FOR ROOF ONLY |  | WOOD ALL SPECIES | MIN. WIDTH X DEPTH EACH MEMBER | | | | 4" X 6" |
| 28. | FLOOR & ROOF DECK |  | WOOD ALL SPECIES | ROOF ----- FLOOR | | | | 2" T & G. OR 3" SOLID 3" T & G. + 1" T & G. OR 4" SOLID | |

(n) Cover thickness on reinforcing steel as indicated is based on continuity of system. For simple span conditions increase cover thickness by 50%.

(p) Wire mesh reinforced and with a minimum area of 0.015 inches square per foot of length or equivalent.

History: Cr. Register, February, 1971, No. 182, eff. 7-1-71.

Ind 51.046 Calculation method. (1) The rational design of structural members for fire resistance shall be submitted to the department and shall be based on the type of span (simple or restrained), the magnitude of longitudinal restraint, accepted structural engineering principals and methods.

(a) Appropriate research data and design criteria to substantiate the method, interpreting between known information, shall accompany the above material and shall include:

1. Time—temperature relationship ASTM E-119.
2. The temperature—strength characteristics of the structural components.
3. The time—temperature characteristics of the insulating material, at temperature range designated by ASTM E-119.
4. The expansion characteristics of the materials comprising the member, at the temperature range designated by ASTM E-119.

NOTE: 1. For ASTM E-119 standard adopted see Ind 51.25 (90).

2. The department will accept published research data from Portland Cement Association, American Iron & Steel Institute, and American Institute of Steel Construction, Inc.

5. The safety factor of not less than 1.0 shall be maintained at the end of the time requirement for the full design live and dead load.

History: Cr. Register, February, 1971, No. 182, eff. 7-1-71.

Ind 51.047 Openings in fire rated construction. (1) Openings in fire rated construction where permitted by other sections of the code shall satisfy the following appropriate requirements.

(a) *Fire door assemblies.* 1. Openings. Where openings are permitted in fire rated walls protected with door assemblies they shall be time rated and labeled as 3, 1½, 1, ¾ hour by an approved laboratory and tested in accordance with ASTM E-152 standard method.

NOTE: 1. For ASTM E-152 standard adopted see section Ind 51.25 (92).

2. Three-hour rated doors are accepted for all openings in 3 and 4-hour fire-resistive walls. One and one-half (1½) hour rated doors are accepted for all openings in 2-hour fire-resistive interior and exterior walls. Three-quarter (¾) hour rated doors are accepted for openings in 1-hour fire-resistive walls and openings to exterior fire escapes. Door assemblies with glued solid wood core flush doors, 1¾ inches thick, quality certified as meeting National Woodwork Manufacturers Association Industry Standard IS-1-69, and in addition possessing no core voids, may be used where the occupancy sections of this code permit.

2. The door assemblies shall be installed with frame, hinges, latches, closing devices and counterweights in accordance with methods and standards approved by the department.

3. Methods of securing door frame to adjacent construction shall be illustrated on the plans submitted to the department for approval.

NOTE: The department will accept recommended practices for installation covered in "Standard for Fire Door and Windows" N.F.P.A. No. 80.

4. The maximum swinging door clearances to frame shall be $\frac{1}{8}$ inch on sides and top and $\frac{3}{4}$ inch at bottom between sill or floor.

5. All labeled fire doors where required shall be equipped with an approved closing device.

a. Doors with self-closing device shall remain in a closed position except when in use.

NOTE: The intent was to accept normal usage of door but not permit doors with this device to be blocked open at any time.

b. Where a pilot weight is used, it shall be suspended from a chain or wire cable and shall be installed in a protective housing.

NOTE: For type of closing device permitted please refer to chapters for classes of construction and/or occupancy.

6. Adequate clearance shall be maintained to permit free operation of fire doors.

Note: 1. See section Ind 51.15 for exit door requirements.

2. Transoms, vision panels and/or louvers may be incorporated if tested in accordance with ASTM E-152 standard method.

(b) *Fire window assemblies.** 1. Openings. Where openings are permitted in fire rated walls protected with fire window assemblies they shall be time rated as $\frac{3}{4}$ hour by an approved laboratory and tested in accordance with ASTM E-163 standard method.

NOTE: For ASTM E-163 standard adopted see section Ind 51.25 (93).

2. *Size.* The fire window assembly size shall not exceed size tested. Windows combined in multiple assemblies shall be separated by approved nonbearing metal mullions.

3. *Wired Glass.* Labeled wired glass $\frac{1}{4}$ inch thick shall be installed in a fire window assembly.

***NOTE:** Fire windows have been classified for either moderate or light fire exposure. For moderate fire exposure the individual glass size is limited to 720 sq. inches. (Size limitation either 48 inch max. width or 54 inch max. height.) For light fire exposure the individual glass size is limited to 1,296 sq. inches. (Size limitation either 54 inch max. width or 54 inch max. height.) Please refer to chapters for classes of construction and/or occupancy for fire window classifications.

4. *Installation.** a. Frames shall be securely fastened to the construction and be capable of resisting all wind stresses and other stresses to which they are likely to be subjected.

b. The wired glass shall be well bedded in approved glazing compound and all exposed joints between the metal shall be struck and pointed. The clearance between the edges of the glass and metal framing shall not exceed $\frac{1}{8}$ inch.

***NOTE:** The department will accept recommended practices for installation covered in "Standard for Fire Doors and Windows" N.F.P.A. No. 80.

(c) *Glass block.* 1. *Openings.* Where openings are permitted in fire rated walls protected with glass block they shall be time rated as $\frac{3}{4}$ hour by an approved laboratory and tested in accordance with ASTM E-163 standard method.

NOTE: For ASTM E-163 standard adopted see section Ind 51.25 (93).

2. *Size of opening.* Glass blocks are suitable for openings not exceeding 120 square feet in area, with neither the width nor height exceeding 12 feet.

3. Installation.

NOTE: The department will accept recommended practices for installation covered in "Standard for Fire Doors and Windows" N.F.P.A. No. 80.

(d) *Labels.* 1. The label shall identify the time rating for fire door assemblies and class of fire window assemblies and glass block.

2. The label shall identify the testing laboratory, listing agency and manufacturer.

3. The label shall be securely attached and located to permit visual inspection after installation.

(e) *Miscellaneous openings.* 1. Openings around ducts, pipes, conduit or other service installations penetrating required fire-resistive rated floor, wall and roof assemblies shall be filled solidly with material of fire-resistive rating equal to the required rating of assembly penetrated.

2. Duct openings in required fire-resistive rated floor and wall assemblies shall be protected as specified under section Ind 59.69 (13).

History: Cr. Register, February, 1971, No. 182, eff. 7-1-71.

Ind 51.048 Roof coverings. (1) Roof coverings of class A, B, C or unclassified shall be provided as specified under "Classes of Construction" or under the specific occupancy requirements.

NOTE: Brick, concrete, tile, slate, ferrous and cupreous metals and their alloys will be accepted as "Class A" roof coverings.

History: Cr. Register, February, 1971, No. 182, eff. 7-1-71.

Subsections Ind 51.08(2)(a); (2)(b) and (2)(c) are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

~~(2) Occupancy separations shall be classed as "Absolute", "Special" and "Ordinary" and shall apply to both horizontal and vertical separations.~~

(a) An absolute occupancy separation shall have no openings therein and shall be of not less than 4-hour fire-resistive construction as specified in sections Ind 51.05 and Ind 51.06.

(b) A special occupancy separation shall be of not less than 3-hour fire-resistive construction as specified in sections Ind 51.05 and 51.06. All openings in walls forming such separation shall be protected on each side thereof by self-closing fire-resistive doors as specified in section Ind 51.09, and such doors shall be kept normally closed. The total width of all openings in any such separating wall in any one story shall not exceed 25% of the length of the wall in that story and no single opening shall have an area greater than 120 square feet.

1. All openings in floors forming this type of separation shall be protected by vertical enclosures extending above and below such openings. The walls of such vertical enclosures shall be of not less than 2-hour fire-resistive construction as specified in section Ind 51.05 and all openings therein shall be protected on one side thereof by self-closing one-hour fire-resistive doors as specified in section Ind 51.09 and such doors shall be kept normally closed.

(c) An ordinary occupancy separation shall be of not less than one-hour fire-resistive construction as specified in sections Ind 51.05 and 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.

Subsections Ind 51.08(2)(a); (2)(b) and (2)(c) are created to become effective January 1, 1972.

~~(2) Occupancy separations shall be classed as "Absolute", "Special" and "Ordinary" and shall apply to both horizontal and vertical separations.~~

(a) An absolute occupancy separation shall have no openings therein and shall have walls and floors of not less than 4-hour fire resistive construction as specified in section Ind 51.04.

(b) A special occupancy separation shall have walls and floors of not less than 3-hour fire-resistive construction as specified in section Ind 51.04. All openings in walls forming such separation shall be protected on each side thereof by self-closing fire-resistive doors as specified in section Ind 51.047, and such doors shall be kept normally closed. The total width of all openings in any such separating wall in any one story shall not exceed 25% of the length of the wall in that story and no single opening shall have an area greater than 120 square feet.

1. All openings in floors forming this type of separation shall be protected by vertical enclosures extending above and below such openings. The walls of such vertical enclosures shall be of not less than 2-hour fire-resistive construction as specified in section Ind 51.04 and all openings therein shall be protected on one side thereof by self closing 1-hour fire-resistive doors as specified in section Ind 51.047 and such doors shall be kept normally closed.

(c) An ordinary occupancy separation shall have walls and floors of not less than 1-hour fire-resistive construction as specified

51.04.

in sections Ind ~~51.05~~ and ~~51.06~~. All openings in such separations shall be protected by self-closing fire-resistive doors as specified in section Ind 51.047 and such doors shall be kept normally closed.

History: 1-2-56; r. and rec. (2) (c), Register, October, 1967, No. 142, eff. 11-1-67; am. (2) (a), (b) and (c), Register, February, 1971, No. 182, eff. 7-1-71.

Sections Ind 51.09 through 51.11 are created effective August 1, 1971 and expiring January 1, 1972.

NOTE: SECTIONS IND 51.09 THROUGH IND 51.11 ARE REPEALED EFFECTIVE JANUARY 1, 1972.

Ind 51.09 Fire-resistive doors. (1) Fire-resistive doors have no time resistance rating established by governmental agencies. It will be the policy of the department of industry, labor and human relations to approve, subject to the provisions of this section, any door given a rating by the Underwriters' Laboratories in their "Building Materials List" as class A, B, C, D and E having varying degrees of resistance, and suitable for various locations.

(2) Where fire-resistive doors are required, class A doors, or equal shall be used for all openings in 3 and 4 hour fire-resistive walls. Class B, 1½-hour fire-resistive doors, or equal shall be used for all openings in 2-hour walls. Doors for elevator shafts shall be of class B type or equal. Class C doors, or equal, shall be used in openings in corridor partitions in fire-resistive buildings and for openings in one-hour fire-resistive partitions except that wood doors of solid flush type, 1¾ inches thick may be used in such buildings which are less than 85 feet in height. Class D and E doors, or better, shall be used in outside wall openings where required for fire escapes.

(3) All required fire-resistive doors shall be equipped with a self-closing device.

Ind 51.10 Fire-resistive windows. (1) Windows shall be of a design approved by the department of industry, labor and human relations for the intended use as provided under occupancy classifications. The term "window" in this section shall include the frame, sash and all other parts of a complete assembly. Approved wire glass ¼ inch in thickness shall be used for glazing.

(2) Windows shall be limited to sizes for which effective fire-resistance has been demonstrated by actual fire test, and which in no case exceed 84 square feet in area and 12 feet in greatest dimension. Such windows may be combined in multiple assemblies when separated by approved metal mullions, which shall be considered non-bearing.

(3) Individual glass lights shall not exceed 720 square inches in area, and 54 inches in vertical and 48 inches in horizontal dimension.

Note: It will be the policy of the department of industry, labor and human relations to approve, subject to the provisions of this section, any window bearing the inspection manifest of the Underwriters' Laboratories for the situation of installation.

Ind 51.11 Glass block. (1) USE. Approved glass block may be used in non-load bearing panels in walls where ordinary glass will be permitted, unless specifically prohibited by occupancy requirements of this code.

(2) INSTALLATION. Glass block panels shall not exceed 144 square feet in unsupported area, with a maximum height of 20 feet and a maximum width of 20 feet. The horizontal and vertical mortar joints between each block shall be composed of one part of Portland cement, one part of lime and 4 parts of sand, or its equivalent.

(a) All panels over 6 feet in width shall be supported on each side by chases, not less than 1½ inches in depth, of metal or other incombustible material.

(b) Approved continuous metal bond ties shall be provided in each horizontal mortar joint for block of nominal 12 x 12 inch size and in at least every third joint for block of smaller dimension.

(c) Provision shall be made in all panels for expansion, using approved expansion material not less than ½ inch thick for heads and lintels and not less than ¼ inch thick for jambs.

Subsections Ind 51.17(1) and (2) are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

Ind 51.17 Smokeproof stair tower. (1) A smokeproof stair tower shall be an enclosed stairway which is entirely cut off from the building and which is reached by means of open balconies or platforms. The stairways, landings, platforms and balconies shall be of incombustible material throughout. The enclosing walls shall be of not less than 4-hour fire-resistive construction as specified in section Ind 51.05, and the floors and ceilings of not less than 2-hour fire-resistive construction as specified in section Ind 51.06.

(2) The doors leading from the buildings to the balconies and from the balconies to the stairways shall be fire-resistive doors as specified in section Ind 51.09, and all openings within 10 feet of any balcony shall be protected with fire-resistive windows as specified in section Ind 51.10, or fire-resistive doors.

Subsections Ind 51.17(1) and (2) are created to become effective January 1, 1972.

Ind 51.17 Smokeproof stair tower. (1) A smokeproof stair tower shall be an enclosed stairway which is entirely cut off from the building and which is reached by means of open balconies or platforms. The stairways, landings, platforms and balconies shall be of non-combustible material throughout. The enclosing walls shall be of not less than 4-hour fire-resistive construction, and the floors and ceilings of not less than 2-hour fire-resistive construction as specified in section Ind 51.04.

(2) The doors leading from the buildings to the balconies and from the balconies to the stairways shall be fire-resistive doors, and all openings within 10 feet of any balcony shall be protected with fire-resistive windows, or fire-resistive doors as specified in section Ind 51.047.

History: 1-2-56; am. Register, December, 1962, No. 84, eff. 1-1-63; am. (1) and (2), Register, February, 1971, No. 182, eff. 7-1-71.

Subsections Ind 51.18(1) and (3) are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

Ind 51.18 Interior enclosed stairway. (1) An interior enclosed stairway shall be completely enclosed with walls of not less than 2-hour fire-resistive construction as specified in section Ind 51.05, except that in ordinary or frame buildings and in mill or fire-resistive buildings not more than 3 stories in height one-hour fire-resistive enclosures may be used. All doors opening into such enclosures shall be as specified in section Ind 51.09.

(3) If windows are placed in any such enclosure they shall be fixed fire-resistive windows as specified in section Ind 51.10, except in outside walls.

Subsections Ind 51.18(1) and (3) are created to become effective January 1, 1972.

Ind 51.18 Interior enclosed stairway. (1) An interior enclosed stairway shall be completely enclosed with walls of not less than 2-hour fire-resistive construction as specified in section Ind 51.04, except that in ordinary or frame buildings and in mill or fire-resistive buildings not more than 3 stories in height 1-hour fire-resistive enclosures may be used. All doors opening into such enclosures shall be as specified in section Ind 51.047.

(3) If windows are placed in any such enclosure they shall be fixed fire-resistive windows as specified in section Ind 51.047 except in outside walls.

History: 1-2-56; am. (1) and (3), Register, February, 1971, No. 182, eff. 7-1-71.

Subsections Ind 51.19(2) and (4) are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(2) Openings used in connection with horizontal exits shall be protected by fire-resistive doors as specified in section Ind 51.09. If swinging doors are installed in pairs, they shall be arranged to swing in opposite directions; with direction of travel indicated by signs, except that where the travel is in one direction only, both doors shall swing in that direction. Such doors shall be kept continuously unlocked whenever the building is occupied and be normally closed or be self-closing and equipped with fusible links.

(4) All doors and windows within 10 feet of any balcony or bridge shall be fire-resistive doors as specified in Wis. Adm. Code section Ind 51.09, or fire-resistive windows as specified in section Ind 51.10, except that if such doors or windows are in the same plane, this requirement shall apply only to those within 5 feet of the balcony or bridge.

Subsections Ind 51.19(2) and (4) are created to become effective January 1, 1972.

(2) Openings used in connection with horizontal exits shall be protected by fire-resistive doors as specified in section Ind 51.047. If swinging doors are installed in pairs, they shall be arranged to swing in opposite directions; with direction of travel indicated by signs, except that where the travel is in one direction only, both doors shall swing in that direction. Such doors shall be kept continuously

unlocked whenever the building is occupied and be normally closed or be self-closing and equipped with fusible links.

(4) All doors and windows within 10 feet of any balcony or bridge shall be fire-resistive doors or fire-resistive windows as specified in section Ind 51.047, except that if such doors or windows are in the same plane, this requirement shall apply only to those within 5 feet of the balcony or bridge.

History: 1-2-56; am. (2) and (4), Register, February, 1971, No. 182, eff. 7-1-71

Subsection Ind 51.20(1)(a) is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

Ind 51.20 Fire escapes. (1) ~~Every fire escape shall be so located as to lead directly to a street, alley or open court connected with a street.~~

(a) Every fire escape shall be placed against a blank wall if possible. If such a location is not possible then every wall opening which is less than 6 feet distant horizontally from any tread or platform of the fire escape shall be protected by a fire-resistive door as specified in section Ind 51.09 or by a fire-resistive window as specified in section Ind 51.10.

Subsection Ind 51.20(1)(a) is created to become effective January 1, 1972.

Ind 51.20 Fire escapes. (1) ~~LOCATION: Every fire escape shall be so located as to lead directly to a street, alley or open court connected with a street.~~

(a) Every fire escape shall be placed against a blank wall if possible. If such a location is not possible then every wall opening which is less than 6 feet distant horizontally from any tread or platform of the fire escape shall be protected by a fire-resistive door or by a fire-resistive window as specified in section Ind 51.047.

History: 1-2-56; am. Register, December, 1967, pp. 81, eff. 1-1-63; am. (1) (a), Register, February, 1971, No. 182, pp. 1-1-71; am. (7), Register, February, 1971, No. 182, eff. 3-1-71.

Subsections Ind 51.25(88) through (93) are repealed and recreated to become effective January 1, 1972.

(88) SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS. Part 14 ASTM Designation E 84-68.

(89) FIRE TESTS OF ROOF COVERINGS. Part 14 ASTM Designation E 108-70.

(90) FIRE TESTS OF BUILDING CONSTRUCTION AND MATERIALS. Part 14 ASTM Designation E 119-69.

(91) NONCOMBUSTIBILITY OF ELEMENTARY MATERIALS. Part 14 ASTM Designation E 136-65.

(92) FIRE TESTS OF DOOR ASSEMBLIES. Part 14 ASTM Designation E 152-66.

(93) FIRE TEST OF WINDOW ASSEMBLIES. Part 14 ASTM Designation E 163-65.

Note: The above standards may be obtained for personal use from American Society of Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103. They are available for inspection in the office of the department, the secretary of state and the revisor of statutes.

History: Cr. Register, October, 1967, No. 142, eff. 11-1-67; cr. (88), (89), (90), (91), (92), and (93), Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 52.01(5) is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(5) In every building more than 4 stories in height, all doors, windows and other openings in outside walls shall be protected with fire-resistive doors or shutters as specified in Wis. Adm. Code section Ind 51.09 or fire-resistive windows as specified in section Ind 51.10, unless such openings are on streets or on alleys or outer courts 20 feet or more in width.

Subsection Ind 52.01(5) is created to become effective January 1, 1972.

(5) In every building more than 4 stories in height, all doors, windows and other openings in outside walls shall be protected with fire-resistive doors or shutters or fire-resistive windows as specified in section Ind 51.047, unless such openings are on streets or on alleys or outer courts 20 feet or more in width.

History: 1-2-56; am. (5), Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 54.01(3) is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(3) No building shall be limited in area when divided into sections which do not exceed the maximum areas tabulated in this section by division walls. Such division walls shall have not less than a 4-hour fire-resistive rating as specified in Wis. Adm. Code section Ind 51.05 and shall extend 3 feet above the roof unless the roof is of fire-resistive construction. All openings in such walls shall be protected by fire-resistive doors as specified in section Ind 51.09. Such doors may normally remain open if held in that position by fusible links.

Subsection Ind 54.01(3) is created to become effective January 1, 1972.

(3) No building shall be limited in area when divided into sections which do not exceed the maximum areas tabulated in this section by division walls. Such division walls shall have not less than a 4-hour fire-resistive rating as specified in Wis. Adm. Code section Ind 51.04 and shall extend 3 feet above the roof unless the roof is of fire-resistive construction. All openings in such walls shall be protected by fire-resistive doors as specified in section Ind 51.047. Such doors may normally remain open if held in that position by fusible links.

History: 1-2-56; am. (2) and (3), Register, September, 1959, No. 45, eff. 10-1-59; am. (3), Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 54.02(1)(b) is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(b) The second story of a 2 story building, provided such story is used only for offices; is not over 3000 square feet in area; and has a stairway enclosed with not less than one-hour fire-resistive construction, as specified in section Ind 51.05, leading directly to the outside and not leading to the basement. Such enclosure shall be unpierced except for the entrance and exit doors.

Subsection Ind 54.02(1)(b) is created to become effective January 1, 1972.

(b) The second story of a 2 story building, provided such story is used only for offices; is not over 3,000 square feet in area; and has a stairway enclosed with not less than 1-hour fire-resistive construction, as specified in section Ind 51.04, leading directly to the outside and not leading to the basement. Such enclosure shall be unpierced except for the entrance and exit doors.

History: 1-2-56: cr. (1) (c), Register, September, 1959, No. 45, eff. 10-1-59; am. (1) (b), Register, February, 1971, No. 182, eff. 7-1-71.

Subsections Ind 54.08(1)(a); (1)(b); (1)(c); (1)(d) and (2) are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(a) Fire-resistive buildings, not less than 2-hour fire-resistive construction as specified in section Ind 51.05.

(b) Mill constructed buildings, not less than 2-hour fire-resistive construction as specified in section Ind 51.05.

(c) Ordinary constructed buildings, not less than one-hour fire-resistive construction as specified in section Ind 51.05.

(d) Frame constructed buildings, not less than one-hour fire-resistive construction as specified in section Ind 51.05.

(2) All doors opening into such enclosures shall be as specified in section Ind 51.09, and all windows shall be of wired glass and metal frames and sash.

Subsections Ind 54.08(1)(a); (1)(b); (1)(c); (1)(d) and (2) are created to become effective January 1, 1972.

(a) Fire-resistive buildings, not less than 2-hour fire-resistive construction as specified in section Ind 51.04.

(b) Mill constructed buildings, not less than 2-hour fire-resistive construction as specified in section Ind 51.04.

(c) Ordinary constructed buildings, not less than 1-hour fire-resistive construction as specified in section Ind 51.04.

(d) Frame constructed buildings, not less than 1-hour fire-resistive construction as specified in section Ind 51.04.

(2) All doors opening into such enclosures shall be as specified in section Ind 51.047, and all windows shall be of wired glass and metal frames and sash.

History: 1-2-56; am. (1) (a), (b), (c), (d) and (2), Register, February, 1971, No. 182, eff. 7-1-71.

Section Ind 54.10 is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

Ind 54.10 Trap doors and floor openings. Every opening through any floor or through any roof used by the public or by employes shall be guarded by a substantial enclosure or rail not less than 3 feet 6 inches high. Floor openings in buildings of more than 2 stories, unless enclosed with fire-resistive enclosures as specified in section Ind 54.08 shall be protected by fire-resistive doors as specified in section Ind 51.09.

Section Ind 54.10 is created to become effective January 1, 1972

Ind 54.10 Trap doors and floor openings. Every opening through any floor or through any roof used by the public or by employes shall be guarded by a substantial enclosure or rail not less than 3 feet 6 inches high. Floor openings in buildings of more than 2 stories, unless enclosed with fire-resistive enclosures as specified in section Ind 54.08 shall be protected by fire-resistive doors as specified in section Ind 51.047.

History: 1-2-56; am. Register, February, 1971, No. 182, eff. 7-1-71.

Subsections Ind 54.13(1) and (2) are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

Ind 54.13 Isolation of hazards. (1) All heating boilers and furnaces, power boilers, fuel rooms, storage vaults for paints, oils, and similar combustibles and other similar hazards in a building shall be isolated from the rest of the building by at least a 2-hour fire-resistive enclosure as specified in sections Ind 51.05 and Ind 51.06; except that in buildings not more than 2 stories in height and having a floor area of not more than 3000 square feet per floor, a one-hour fire-resistive enclosure as specified in sections Ind 51.05 and Ind 51.06, or better, shall be provided.

(2) All openings shall be protected with self-closing fire-resistive doors as specified in section Ind 51.09.

Subsections Ind 54.13(1) and (2) are created to become effective January 1, 1972.

Ind 54.13 Isolation of hazards. (1) All heating boilers and furnaces, power boilers, fuel rooms, storage vaults for paints, oils, and similar combustibles and other similar hazards in a building shall be isolated from the rest of the building by at least a 2-hour fire-resistive enclosure as specified in section Ind 51.04; except that in buildings not more than 2 stories in height and having a floor area of not more than 3,000 square feet per floor, a 1-hour fire-resistive enclosure as specified in section Ind 51.04, or better, shall be provided.

(2) All openings shall be protected with self-closing fire-resistive doors as specified in section Ind 51.047.

History: 1-2-56; am. (1) and (2), Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 55.02(2)(a) is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(a) Not more than one story in height without a balcony, and with no basement except a heating and fuel room enclosed with fire-resistive construction as specified in section Ind 55.29, with all interior openings protected with self-closing fire-resistive doors as specified in section Ind 51.09.

Subsection Ind 55.02(2)(a) is created to become effective January 1, 1972.

(a) Not more than one story in height without a balcony, and with no basement except a heating and fuel room enclosed with fire-resistive construction as specified in section Ind 55.29, with all interior openings protected with self-closing fire-resistive doors as specified in section Ind 51.047.

History: 1-2-56; (1); (1) (a); (2); (2) (a); (2) (b); (2) (c); (2) (d); (2) (e); (2) (f); (3); am. Register, June, 1956; No. 6, eff. 7-1-56; am. (1) (a), Register, August, 1957, No. 20, eff. 9-1-57; am. Register, January, 1961, No. 61, eff. 2-1-61; am. (2) (a), Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 55.04(3) is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(3) The width of every exit court shall be at least 6 feet for an occupancy not exceeding 500 persons, and shall be increased at the rate of one foot per each 500 persons additional. Every such court shall lead to a public thoroughfare, either directly, or through a passageway of equal width, not less than 8 feet high enclosed with unpierced 4-hour fire-resistive walls, ceiling and floor as specified in sections Ind 51.05 and Ind 51.06. The floor and ceiling shall be designed for a live load of not less than 150 pounds per square foot. No such court, or passageway shall be used for storage or any other purpose whatsoever.

Subsection Ind 55.04(3) is created to become effective January 1, 1972.

(3) The width of every exit court shall be at least 6 feet for an occupancy not exceeding 500 persons, and shall be increased at the rate of one foot per each 500 persons additional. Every such court shall lead to a public thoroughfare, either directly, or through a passageway of equal width, not less than 8 feet high enclosed with unpierced 4-hour fire-resistive walls, ceiling and floor as specified in section Ind 51.04. The floor and ceiling shall be designed for a live load of not less than 150 pounds per square foot. No such court, or passageway shall be used for storage or any other purpose whatsoever.

History: 1-2-56; am. (3), Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 55.05(3) is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(3) Where a garage which is more than 500 square feet in area, chemical laboratory or other occupancy where flammable or explosive liquids or gases are used or stored is built in connection with a building used for a theater or assembly hall, it shall be separated therefrom by means of 4-hour fire-resistive walls as specified in section Ind 51.05 and unpierced 4-hour fire-resistive floors above and below as specified in section Ind 51.06. All openings in the wall to adjoining parts of the building shall be protected by means of self-closing fire-resistive doors as specified in section Ind 51.09.

Subsection Ind 55.05(3) is created to become effective January 1, 1972.

(3) Where a garage which is more than 500 square feet in area, chemical laboratory or other occupancy where flammable or explosive liquids or gases are used or stored is built in connection with a building used for a theater or assembly hall, it shall be separated therefrom by means of 4-hour fire-resistive walls and unpierced 4-hour fire-resistive floors above and below as specified in section Ind 51.04. All openings in the wall to adjoining parts of the building shall be protected by means of self-closing fire-resistive doors as specified in section Ind 51.047.

History: 1-2-56; am. Register, January, 1961, No. 61, eff. 2-1-61; am. (3), Register, February, 1971, No. 182, eff. 7-1-71.

Section Ind 55.20 is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

Ind 55.20 Elevator and vent shafts. Enclosures for elevator and vent shafts shall be of 2-hour fire-resistive construction as specified in section Ind 51.05 and all openings therein protected by fire-resistive doors or windows as specified in sections Ind 51.09 and Ind 51.10.

Section Ind 55.20 is created to become effective January 1, 1972.

Ind 55.20 Elevator and vent shafts. Enclosures for elevator and vent shafts shall be of 2-hour fire-resistive construction as specified in section Ind 51.04 and all openings therein protected by fire-resistive doors or windows as specified in section Ind 51.047.

History: 1-2-56; am. Register, February, 1971, No. 182, eff. 7-1-71.

Subsections Ind 55.21(1) intro. par. and (1)(a) are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

Ind 55.21 Stage separation. (1) In every theater and assembly hall the stage shall be completely separated from the auditorium by a proscenium wall of 4-hour fire-resistive construction as specified in section Ind 51.05, except as follows:

(a) In theaters and assembly halls having a capacity not exceeding 500 persons, the proscenium wall shall be of 2-hour fire-resistive construction as specified in section Ind 51.05, or better.

Subsections Ind 55.21(1) intro. par. and (1)(a) are created to become effective January 1, 1972.

Ind 55.21 Stage separation. (1) In every theater and assembly hall the stage shall be completely separated from the auditorium by a proscenium wall of 4-hour fire-resistive construction as specified in section Ind 51.04, except as follows:

(a) In theaters and assembly halls having a capacity not exceeding 500 persons, the proscenium wall shall be of 2-hour fire-resistive construction as specified in section Ind 51.04, or better.

History: 1-2-56; am. (1) intro par., and (1) (a), Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 55.29(1) is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

Ind 55.29 Boiler and furnace rooms. (1) Every boiler or furnace room, including the breeching and fuel room, shall be enclosed with a 3-hour fire-resistive enclosure as specified in sections Ind 51.05 and 51.06, except that in case of an assembly hall accommodating not more than 300 persons, a 2-hour fire-resistive enclosure as specified in sections Ind 51.05 and 51.06 may be used. All openings shall be protected with self-closing fire-resistive doors as specified in section Ind 51.09.

Subsection Ind 55.29(1) is created to become effective January 1, 1972.

Ind 55.29 Boiler and furnace rooms. (1) Every boiler or furnace room, including the breeching and fuel room, shall be enclosed with a 3-hour fire-resistive enclosure as specified in section Ind 51.04, except that in case of an assembly hall accommodating not more than 300 persons, a 2-hour fire-resistive enclosure as specified in section Ind 51.04 may be used. All openings shall be protected with self-closing fire-resistive doors as specified in section Ind 51.047.

History: 1-2-56; r. and recr. (2), Register, August, 1957, No. 20, eff. 9-1-57; am. (1), Register, September, 1959, No. 45, eff. 10-1-59; am. (1), Register, February, 1971, No. 182, eff. 7-1-71.

Section Ind 55.41 is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

Ind 55.41 Construction of booth. The floor of each motion picture booth shall be constructed of masonry or reinforced concrete, or shall be covered with not less than 2 inches of fire-resistive material. The walls and ceiling shall be not less than 2-hour fire-resistive construction as specified in section Ind 51.05.

Section Ind 55.41 is created to become effective January 1, 1972.

Ind 55.41 Construction of booth. The floor of each motion picture booth shall be constructed of masonry or reinforced concrete, or shall be covered with not less than 2 inches of fire-resistive material. The walls and ceiling shall be not less than 2-hour fire resistive construction as specified in section Ind 51.04.

History: 1-2-56; am. Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 55.42(2) is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(2) The door shall be a tight-fitting self-closing fire door as specified in section Ind 51.09, shall open outwardly, and shall not be equipped with any latch.

Subsection Ind 55.42(2) is created to become effective January 1, 1972.

(2) The door shall be a tight-fitting self-closing fire door as specified in section Ind 51.047, shall open outwardly, and shall not be equipped with any latch.

History: 1-2-56; am. (2), Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 55.51(1) is repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

Ind 55.51 Grandstands. (1) Grandstands erected of frame construction shall be located at least 20 feet from any other building or adjoining property line unless the exterior walls of such adjacent building are of 2-hour fire-resistive construction or better and all openings therein are protected with fire-resistive doors and windows as specified in sections Ind 51.09 and Ind 51.10.

Subsection Ind 55.51(1) is created to become effective January 1, 1972.

Ind 55.51 Grandstands. (1) Grandstands erected of frame construction shall be located at least 20 feet from any other building or adjoining property line unless the exterior walls of such adjacent building are of 2-hour fire-resistive construction or better and all openings therein are protected with fire-resistive doors and windows as specified in section Ind 51.047.

History: 1-2-56; am. (1), Register, February, 1971, No. 182, eff. 7-1-71.

Section Ind 56.04 is repealed and recreated effective August 1, 1971 and expires January 1, 1972.

Ind 56.04 Subdivisions and fire stops. Every building of this classification which is built in connection with a building of a lower grade of construction shall be separated from such other building by walls of 4-hour fire-resistive construction as specified in section Ind 51.05, and all communicating openings shall be protected by fire-resistive doors as specified in section Ind 51.09 or equal. If such openings are used as a means of egress, they shall be kept normally open during the occupancy of the building.

Section Ind 56.04 is created to become effective January 1, 1972.

Ind 56.04 Subdivisions and fire stops. Every building of this classification which is built in connection with a building of a lower grade of construction shall be separated from such other building by walls of 4-hour fire-resistive construction as specified in section Ind 51.04, and all communicating openings shall be protected by fire-resistive doors as specified in section Ind 51.047 or equal. If such openings are used as a means of egress, they shall be kept normally open during the occupancy of the building.

History: 1-2-56; am. Register, February, 1971, No. 182, eff. 7-1-71.

Section Ind 56.15 is repealed and recreated effective August 1, 1971 and expires January 1, 1972.

Ind 56.15 Heating plants. (1) In every building more than one story in height, all heating plants and fuel rooms shall be enclosed with not less than 4-hour fire-resistive construction as specified in Wis. Adm. Code sections Ind 51.05 and Ind 51.06. All openings shall be protected with self-closing fire-resistive doors as specified in section Ind 51.09.

(2) In one story buildings all heating plants and fuel rooms shall be enclosed with not less than 2-hour fire-resistive construction as

specified in sections Ind 51.05 and 51.06, except that this requirement shall not apply to buildings where jacketed stoves or school room heaters are permitted. All openings shall be protected by self-closing fire-resistive doors as specified in section Ind 51.09.

Section Ind 56.15 is created to become effective January 1, 1972.

Ind 56.15 Heating plants. (1) In every building more than one story in height, all heating plants and fuel rooms shall be enclosed with not less than 4-hour fire-resistive construction as specified in Wis. Adm. Code section Ind 51.04. All openings shall be protected with self-closing fire-resistive doors as specified in section Ind 51.047.

(2) In one story buildings all heating plants and fuel rooms shall be enclosed with not less than 2-hour fire-resistive construction as

specified in section Ind 51.04, except that this requirement shall not apply to buildings where jacketed stoves or school room heaters are permitted. All openings shall be protected by self-closing fire-resistive doors as specified in section Ind 51.047.

History: 1-2-56; am. Register, February, 1971; No. 182, eff. 7-1-71.

Subsection Ind 57.02(1) is repealed and recreated effective August 1, 1971 and expires January 1, 1972.

Ind 57.02 First floor fire-resistive. (1) In 3 story buildings, except those having not more than one family on each floor, the first floor and its supports shall be of not less than 3-hour fire-resistive construction as specified in section Ind 51.06, except that in a 3 story apartment house which will accommodate not more than 4 families, or a 3 story hotel or rooming house which will accommodate not more than 30 persons, above the first story, the basement ceiling shall be of not less than one-hour fire-resistive construction as specified in section Ind 51.06 or shall be protected by automatic sprinklers as specified in section Ind 51.23.

Subsection Ind 57.02(1) is created to become effective January 1, 1972.

Ind 57.02 First floor fire-resistive. (1) In 3 story buildings, except those having not more than one family on each floor, the first floor and its supports shall be of not less than 3-hour fire-resistive construction as specified in section Ind 51.04, except that in a 3 story apartment house which will accommodate not more than four families, or a 3 story hotel or rooming house which will accommodate not more than 30 persons, above the first story, the basement ceiling shall be of not less than 1-hour fire-resistive construction as specified in section Ind 51.04 or shall be protected by automatic sprinklers as specified in section Ind 51.23.

History: 1-2-56; am. (1), Register, February, 1971, No. 182, eff. 7-1-71.

Section Ind 57.03 is repealed and recreated effective August 1, 1971 and expires January 1, 1972.

Ind 57.03 Garage and business separation. (1) In every building in which a lower story is used for garage purposes, the ceiling over the garage shall be of unpierced 4-hour fire-resistive construction as specified in section Ind 51.06. Stairways from garages leading to the upper stories shall be separated from the garage area with walls of 4-hour fire-resistive construction as specified in section Ind 51.05, with openings protected as specified for special occupancy separation, section Ind 51.08.

(2) In a building more than 2 stories in height where the lower story is used for business purposes, other than the hazards listed in Chapter Ind 57 of this code, the ceiling over the lower story shall be of not less than one-hour fire-resistive construction as specified in section Ind 51.06.

Section Ind 57.03 is created to become effective January 1, 1972.

Ind 57.03 Garage and business separation. (1) In every building in which a lower story is used for garage purposes, the ceiling over the garage shall be of unpierced 4-hour fire-resistive construction as specified in section Ind 51.04. Stairways from garages leading to the upper stories shall be separated from the garage area with walls of 4-hour fire-resistive construction as specified in section Ind 51.04, with openings protected as specified for special occupancy separation, section Ind 51.08.

(2) In a building more than 2 stories in height where the lower story is used for business purposes, other than the hazards listed in Chapter Ind 57 of this code, the ceiling over the lower story shall be of not less than 1-hour fire-resistive construction as specified in section Ind 51.04.

History: 1-2-66; am. Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 57.04(1) is repealed and recreated effective August 1, 1971 and expires January 1, 1972.

Ind 57.04 Corridor and dividing partitions. (1) All 3 story places of abode which have more than one apartment or 8 rooms on any floor, shall have the public passageways enclosed with partitions of not less than one-hour fire-resistive construction as specified in section Ind 51.05. If there is more than one apartment on any floor, such apartments shall be separated by such partitions. If there are more than 8 rooms on any floor, they shall be divided by such partitions into groups of not more than 8 rooms each.

Subsection Ind 57.04(1) is created to become effective January 1, 1972.

Ind 57.04 Corridor and dividing partitions. (1) All 3 story places of abode which have more than one apartment or 8 rooms on any floor, shall have the public passageways enclosed with partitions of not less than 1-hour fire-resistive construction as specified in section Ind 51.04. If there is more than one apartment on any floor, such apartments shall be separated by such partitions. If there are more than 8 rooms on any floor, they shall be divided by such partitions into groups of not more than 8 rooms each.

History: 1-2-56; am. (1), Register, February, 1971, No. 182, eff. 7-1-71.

Section Ind 57.05 is repealed and recreated effective August 1, 1971 and expires January 1, 1972.

Ind 57.05 Court walls. The walls of courts and similar interior shafts for light and air shall be of not less than 3-hour fire-resistive construction as specified in section Ind 51.05, except that when the building is permitted to be of ordinary construction, the court walls may be of one-hour fire-resistive construction.

Section Ind 57.05 is created to become effective January 1, 1972.

Ind 57.05 Court walls. The walls of courts and similar interior shafts for light and air shall be of not less than 3-hour fire-resistive construction as specified in section Ind 51.04, except that when the building is permitted to be of ordinary construction, the court walls may be of 1-hour fire-resistive construction.

History: 1-2-56; am. Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 57.07(4) is repealed and recreated effective August 1, 1971 and expires January 1, 1972.

(4) Apartment buildings 3 stories or less in height whose floors and supporting members are of not less than 2-hour fire-resistive construction, as specified in section Ind 51.06, and which have a plan so arranged that not more than 2 occupancies on any floor make use of a common stairway, may be constructed with one common stairway as a single exit, provided the walls between occupancies and those

enclosing the stairway are of 2-hour fire-resistive construction as specified in section Ind 51.05. In this case, the stairways must be of not less than 2-hour fire-resistive construction, must lead directly to the outside and have all interior openings protected by approved fire-resistive doors as specified in section Ind 51.09.

Subsection Ind 57.07(4) is created to become effective January 1, 1972.

(4) Apartment buildings 3 stories or less in height whose floors and supporting members are of not less than 2-hour fire-resistive construction as specified in section Ind 51.04, and which have a plan so arranged that not more than 2 occupancies on any floor make use of a common stairway, may be constructed with one common stairway as a single exit, provided the walls between occupancies and those enclosing the stairway are of 2-hour fire-resistive construction as specified in section Ind 51.04. In this case, the stairways must be of not less than 2-hour fire-resistive construction, must lead directly to the outside and have all interior openings protected by approved fire-resistive doors as specified in section Ind 51.047.

History: 1-2-56; r. and recr. (1), Register, December, 1970, No. 180, eff. 1-1-71; am. (4), Register, February, 1971, No. 182, eff. 7-1-71.

Section Ind 57.12 is repealed and recreated effective August 1, 1971 and expires January 1, 1972.

Ind 57.12 Enclosure of stairways and shafts. (1) In 3 story buildings all stairways shall be enclosed as provided in sections Ind 51.17 or 51.18, with one-hour fire-resistive partitions, as specified in section Ind 51.05, or better, unless the building is either of fire-resistive construction or equipped throughout with automatic sprinklers. The doors may be omitted in the stories above the basement in one stairway enclosure. In all 3 story buildings accommodating more than 2 families, or 15 persons, above the first story, all basement stairways shall be enclosed with 2-hour fire-resistive partitions as specified in section Ind 51.05.

(2) In buildings more than 3 stories in height, all stairways shall be enclosed with 2-hour fire-resistive partitions, as specified in section Ind 51.05, except that one stairway may be unenclosed in the first and second stories, provided such stairway does not lead to the basement.

(3) In all buildings more than 2 stories in height in which the first story is used for business purposes, at least one stairway shall be enclosed in the first story with an unpierced wall of 2-hour fire-resistive construction, as specified in section Ind 51.05, and such stairway shall not connect with the basement.

(4) Every elevator shaftway, dumbwaiter shaftway, clothes chute, waste paper chute, pipe shafts and other similar vertical shafts in buildings more than 2 stories in height shall be enclosed with 2-hour fire-resistive partitions, as described in section Ind 51.05, except that for 3 story buildings, one-hour fire resistive partitions may be used where the enclosure does not pass through a business portion. In all cases the basement enclosure shall be of not less than 4-hour fire-resistive construction.

Section Ind 57.12 is created to become effective January 1, 1972.

Ind 57.12 Enclosure of stairways and shafts. (1) In 3 story buildings all stairways shall be enclosed as provided in sections Ind 51.17 or 51.18, with 1-hour fire-resistive partitions, as specified in section Ind 51.04, or better, unless the building is either of fire-resistive construction or equipped throughout with automatic sprinklers. The doors may be omitted in the stories above the basement in one stairway enclosure. In all 3 story buildings accommodating more than 2 families, or 15 persons, above the first story, all basement stairways shall be enclosed with 2-hour fire-resistive partitions as specified in section Ind 51.04.

(2) In buildings more than 3 stories in height, all stairways shall be enclosed with 2-hour fire-resistive partitions, as specified in section Ind 51.04, except that one stairway may be unenclosed in the first and second stories, provided such stairway does not lead to the basement.

(3) In all buildings more than 2 stories in height in which the first story is used for business purposes, at least one stairway shall be enclosed in the first story with an unpierced wall of 2-hour fire-resistive construction, as specified in section Ind 51.04, and such stairway shall not connect with the basement.

(4) Every elevator shaftway, dumbwaiter shaftway, clothes chute, wastepaper chute, pipe shafts and other similar vertical shafts in buildings more than 2 stories in height shall be enclosed with 2-hour fire-resistive partitions, as described in section Ind 51.04, except that for 3 story buildings, 1-hour fire-resistive partitions may be used where the enclosure does not pass through a business portion. In all cases the basement enclosure shall be of not less than 4-hour fire-resistive construction.

History: 1-2-56; am. Register, February, 1971, No. 182, eff. 7-1-71.

Section Ind 57.20 is repealed and recreated effective August 1, 1971 and expires January 1, 1972.

Ind 57.20 Isolation of fire hazards. (1) All boiler and furnace rooms, including fuel rooms and breeching, all laundries, drying rooms, carpenter shops, paint shops, and other hazardous work rooms and storage rooms in hospitals and buildings accommodating transients which are more than 3 stories in height and in all asylums and other places of detention shall be enclosed with a 4-hour fire-resistive enclosure as specified in sections Ind 51.05 and 51.06. All openings shall be protected by self-closing fire-resistive doors as specified in section Ind 51.09.

(2) In all other buildings under this classification, such rooms shall be enclosed with a 2-hour fire-resistive enclosure as provided in sections Ind 51.05 and 51.06, or better, except as otherwise provided in this section.

(3) In apartment buildings not more than 2 stories in height, such rooms shall be enclosed with a one-hour fire-resistive enclosure as specified in section Ind 51.05 and 51.06, or better, except as provided in subsection (5).

(4) In one-story buildings having a floor area of not more than 3,000 square feet and 2-story buildings having a floor area of not more than 1,500 square feet per floor which are used for business purposes

and also accommodate not more than 2 families, such rooms shall be enclosed with a one-hour fire-resistive enclosure, as specified in sections Ind 51.05 and 51.06, or better.

(5) The enclosure for the heating plant may be omitted in apartment buildings not more than 2 stories in height and having not more than 2 apartments on a floor and in rooming houses not more than 2 stories in height and having not more than 8 living or sleeping rooms on a floor, provided no part of the building is used for business purposes and all interior basement stairways are enclosed with a one-hour fire resistive enclosure as specified in sections Ind 51.05 and Ind 51.06, or better. See section Ind 57.25 for exception for row house installations. *Exception:*

(a) Gas-fired space heaters may be used in private apartments and in guest rooms in motels or tourist courts without an enclosure if approved by the department of industry, labor and human relations. Space heaters fired with liquid fuel may be used without an enclosure in motels and apartment buildings not more than one story in height.

Section Ind 57.20 is created to become effective January 1, 1972.

Ind 57.20 Isolation of fire hazards. (1) All boiler and furnace rooms, including fuel rooms and breeching, all laundries, drying rooms, carpenter shops, paint shops, and other hazardous work rooms and storage rooms in hospitals and buildings accommodating transients which are more than 3 stories in height and in all asylums and other places of detention shall be enclosed with a 4-hour fire-resistive enclosure as specified in section Ind 51.04. All openings shall be protected by self-closing fire-resistive doors as specified in section Ind 51.047.

(2) In all other buildings under this classification, such rooms shall be enclosed with a 2-hour fire-resistive enclosure as provided in section Ind 51.04, or better, except as otherwise provided in this section.

(3) In apartment buildings not more than 2 stories in height, such rooms shall be enclosed with a 1-hour fire-resistive enclosure as specified in section Ind 51.04, or better, except as provided in subsection (5).

(4) In one-story buildings having a floor area of not more than 3,000 square feet and two-story buildings having a floor area of not more than 1,500 square feet per floor which are used for business purposes and also accommodate not more than two families, such rooms shall be enclosed with a 1-hour fire-resistive enclosure, as specified in section Ind 51.04, or better.

(5) The enclosure for the heating plant may be omitted in apartment buildings not more than 2 stories in height and having not more than 2 apartments on a floor and in rooming houses not more than 2 stories in height and having not more than 8 living or sleeping rooms on a floor, provided no part of the building is used for business purposes and all interior basement stairways are enclosed with a 1-hour fire-resistive enclosure as specified in section Ind 51.04, or better. See section Ind 57.25 for exception to row house installations.

Exception:

(a) Gas-fired space heaters may be used in private apartments and in guest rooms in motels or tourist courts without an enclosure if approved by the Department of Industry, Labor and Human Relations. Space heaters fired with liquid fuel may be used without an enclosure in motels and apartment buildings not more than one story in height.

History: 1-2-56; am. (1), Register, September, 1959, No. 45, eff. 10-1-59; am. Register, February, 1971, No. 182, eff. 7-1-71.

Subsections Ind 57.50(2)(a) intro. par.; (2)(b); (2)(c); (2)(d) and (3) intro. par. are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(2) CONSTRUCTION REQUIREMENTS. (a) All garages, except private garages, which are more than 500 square feet in area shall have walls and roof of ordinary construction, as specified in section Ind 51.02, or better, and all floors of vehicle storage rooms, salesrooms, and repair shops shall be of not less than 4-hour fire-resistive construction, as specified in section Ind 51.06.

(b) All walls, or parts of walls, nearer than 5 feet to a boundary line between premises or to any other building shall be unpierced; all walls, or parts of walls, nearer than 10 feet, but not nearer than 5 feet, to a boundary line between premises or to any other building shall have all openings therein protected by means of fire-resistive doors and windows as specified in sections Ind 51.09 and 51.10.

(c) Where a garage which is more than 500 square feet in area is built in connection with a building used for other purposes, it shall be separated therefrom by means of 4-hour fire-resistive walls as specified in section Ind 51.05 and unpierced 4-hour fire-resistive floors above and below as specified in section Ind 51.06. All openings in the walls to adjoining parts of the building shall be protected by means of self-closing fire-resistive doors as specified in section Ind 51.09. Stairways from garages leading to upper stories shall be separated from the garage area with walls of 4-hour fire-resistive construction as specified in section Ind 51.05 with all openings protected by means of self-closing fire-resistive doors as specified in section Ind 51.09.

(d) Where a garage which is less than 500 square feet in area is built in connection with a public building or place of employment under this code, the garage shall have walls and ceiling of not less than one-hour fire-resistive construction as specified in sections Ind 51.05 and Ind 51.06, and the openings to adjoining parts of the building shall be protected by means of fire-resistive doors as specified in section Ind 51.09.

(3) FIRE PROTECTION. Boilers, furnaces and all open flame equipment within garages and service stations shall be effectively separated from other areas by not less than 2-hour fire-resistive walls, floors and ceilings as specified in sections Ind 51.05 and 51.06. Such enclosures in basements shall have no openings into other basement areas. All stairways leading to such basement enclosures from the first floor shall be enclosed on the first floor with not less than 2-hour fire-resistive construction as specified in sections Ind 51.05 and Ind 51.06, and the opening thereto protected with a fire-resistive door as specified in section Ind 51.09.

Subsections Ind 57.50 (2)(a) intro. par.; (2)(b); (2)(c); (2)(d) and (3) intro. par. are created to become effective January 1, 1972.

(2) CONSTRUCTION REQUIREMENTS. (a) All garages, except private garages, which are more than 500 square feet in area shall have walls and roof of ordinary construction, as specified in section Ind 51.02, or better, and all floors of vehicle storage rooms, salesrooms, and repair shops shall be of not less than 4-hour fire-resistive construction, as specified in section Ind 51.04.

(b) All walls, or parts of walls, nearer than 5 feet to a boundary line between premises or to any other building shall be unpierced. All walls, or parts of walls, nearer than 10 feet, but not nearer than 5 feet, to a boundary line between premises or to any other building shall have all openings therein protected by means of fire-resistive doors and windows as specified in section Ind 51.047.

(c) Where a garage which is more than 500 square feet in area is built in connection with a building used for other purposes, it shall be separated therefrom by means of 4-hour fire-resistive walls as specified in section Ind 51.04 and unpierced 4-hour fire-resistive floors above and below as specified in section Ind 51.04. All openings in the walls to adjoining parts of the building shall be protected by means of self-closing fire-resistive doors as specified in section Ind 51.047. Stairways from garages leading to upper stories shall be separated from the garage area with walls of 4-hour fire-resistive construction as specified in section Ind 51.04 with all openings protected by means of self-closing fire-resistive doors as specified in section Ind 51.047.

(d) Where a garage which is less than 500 square feet in area is built in connection with a public building or place of employment under this code, the garage shall have walls and ceilings of not less than 1-hour fire-resistive construction as specified in section Ind 51.04, and the openings to adjoining parts of the building shall be protected by means of fire-resistive doors as specified in section Ind 51.047.

(3) FIRE PROTECTION. Boilers, furnaces and all open flame equipment within garages and service stations shall be effectively separated from other areas by not less than 2-hour fire-resistive walls, floors and ceilings as specified in section Ind 51.04. Such enclosures in basements shall have no openings into other basement areas. All stairways leading to such basement enclosures from the first floor shall be enclosed on the first floor with not less than 2-hour fire-resistive construction as specified in section Ind 51.04, and the opening thereto protected with a fire-resistive door as specified in section Ind 51.047.

History: 1-2-56; r. and recr. (2) (c), Register, September, 1959, No. 45, eff. 10-1-59; am. Register, January, 1961, No. 61, eff. 2-1-61; am. (3) (a), Register, December, 1967, No. 144, eff. 1-1-68; am. (2) (a) intro. par., (b), (c), (d) and (3) intro. par., Register, February, 1971, No. 182, eff. 7-1-71.

Subsections Ind 57.51(2)(d) and (2)(f)3. are repealed and recreated effective August 1, 1971 and expiring January 1, 1972.

(d) All walls, or parts of walls, in buildings under (a) which are nearer than 5 feet to a boundary line between premises or to any other building shall be unpierced; all walls, or parts of walls nearer than 10 feet, but not nearer than 5 feet, to a boundary line between premises or to any other building shall have all openings therein protected by means of fire-resistive doors and windows as specified in sections Ind 51.09 and 51.10.

3. The floor and enclosure of the under floor space is of 4-hour fire-resistive construction as specified in sections Ind 51.05 and 51.06.

Subsections Ind 57.51(2)(d) and (2)(f)3. are created to become effective January 1, 1972.

(d) All walls, or parts of walls, in buildings under par. (a) which are nearer than 5 feet to a boundary line between premises or to any other building shall be unpierced. All walls, or parts of walls nearer than 10 feet, but not nearer than 5 feet, to a boundary line between premises or to any other building shall have all openings therein protected by means of fire-resistive doors and windows as specified in section Ind 51.047.

3. The floor and enclosure of the underfloor space is of 4-hour fire-resistive construction as specified in section Ind 51.04.

History: 1-2-56; am. (2) (a); cr. (2) (a) 1., Register, September, 1959, No. 45, eff. 10-1-59; am. (2) (d) and (2) (f) 3., Register, February, 1971, No. 182, eff. 7-1-71.

Subsection Ind 57.53(2)(a) is repealed and recreated effective August 1, 1971 and expires January 1, 1972.

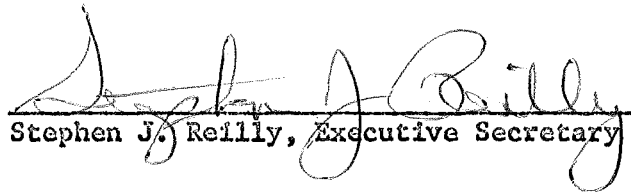
(2) CONSTRUCTION REQUIREMENTS. (a) Parking decks may be erected without enclosing walls except that unpierced enclosing walls of not less than 2-hour fire-resistive construction, as specified in Wis. Adm. Code section Ind 51.05, shall be provided on all sides which are located less than 10 feet from the boundary line between premises or from any other building.

Subsection Ind 57.53(2)(a) is created to become effective January 1, 1972.

(2) CONSTRUCTION REQUIREMENTS. (a) Parking decks may be erected without enclosing walls except that unpierced enclosing walls of not less than 2-hour fire-resistive construction, as specified in section Ind 51.04, shall be provided on all sides which are located less than 10 feet from the boundary line between premises or from any other building.

History: Cr. Register, June, 1956, No. 6, eff. 7-1-56; cr. (2) (g), Register, August, 1957, No. 20, eff. 9-1-57; am. Register, December, 1962, No. 84, eff. 1-1-63; am. (2) (a), Register, February, 1971, No. 182, eff. 7-1-71.

DEPARTMENT OF INDUSTRY, LABOR & HUMAN RELATIONS


Stephen J. Reilly, Executive Secretary

Date: June 14, 1991