

2. The wall shall connect and make tight contact with roof decks of at least 2-hour fire-resistive noncombustible construction on both sides of the wall; or

3. The wall shall connect and make tight contact with roofs of noncombustible construction on both sides of the walls, and the roofs shall be noncontinuous at the wall.

Note: Built-up roofs, including those having class A rating, are considered combustible and do not meet the requirements of this section.

(b) Structural members shall not continue through or over the fire wall.

(c) 1. All openings in fire division walls shall be protected by fire-resistive door assemblies as specified in s. ILHR 51.047.

2. The total area of all openings in any fire division wall in any one story shall not exceed 25% of the area of the wall in that story.

(14) DETERMINATION OF NUMBER OF STORIES. * For purposes of establishing the maximum allowable stories in the various classes of construction stated in s. ILHR 51.03, the number of stories shall be determined on the following basis:

(a) The first floor shall be determined first and this level shall satisfy the following conditions:

1. Is the lowest floor having one or more required exits for that floor and for any floor above or below; and

a. If condition stated in subd. 1. is not satisfied, the highest floor level shall be considered the first floor.

2. a. Except as provided in subpar. b., the elevation of the first floor and the sills of all required exit discharges from the first floor shall be at or not more than 3 feet above an exit discharge grade.

b. Existing buildings to be licensed as child day care centers or to be converted to sheltered facilities for battered women shall comply with the requirements specified in ss. ILHR 57.015 and 60.105.

(b) 1. Except as provided in subd. 2., an interior balcony or mezzanine floor which exceeds 25,000 square feet or $\frac{1}{2}$ of the net main area enclosed within exterior walls or fire division walls or both, whichever is least, shall be counted as a story. The area of the mezzanine may not be added to the main floor area to determine the maximum area of the mezzanine.

2. An open balcony or mezzanine within a single living unit or tenant space which exceeds $\frac{1}{2}$ of the net area enclosed within the walls of that living unit or tenant space shall be counted as a story.

(c) Penthouse with a total area that exceeds 50% of the total roof area shall be counted as a story.

(d) Construction according to sub. (4) (b) 1. b. shall also be counted as a story.

(e) Total number of stories shall include the first floor plus all stories above and those stories determined by pars. (b), (c) and (d).

* See Appendix A for further explanatory material.

1. Floor levels satisfying the definition of basement, ground floor, attic, interior balcony and mezzanine floor, unless otherwise stated, shall not be counted as a story.

(15) DECORATIVE COMBUSTIBLE MATERIALS. Decorative combustible materials may be applied to all required noncombustible exterior surfaces of "0" hourly rated construction or better, up to a limit of 10% of the surface area within any 100 lineal feet of the building.

(a) *Exception.* Fire-retardant treated wood may be applied to all required noncombustible exterior surfaces of "0" hourly rated construction without limit.

(18) ACCESS TO ATTIC AND ROOF. (a) *Attic.* Every attic compartment shall be provided with access from the floor level immediately below it. The access opening shall be at least 20 by 30 inches and shall be located above the stair landing or in an accessible location.

Note: A single access point to the attic from the floor level immediately below will be acceptable if all the attic compartments are interconnected with access openings of at least 20 by 30 inches.

(b) *Roof.* 1. Except as provided in subd. 2., all buildings more than 2 stories, or 25 feet in height, where the slope of the roof is less than 3 in 12, shall be provided with a means of access to the main roof from the floor level immediately below. The roof opening shall be at least 20 by 30 inches and shall be provided with a permanent ladder or stairway.

2. Roof access shall not be required in 3 story buildings without attic space.

(19) ATTIC COMPARTMENTALIZATION. (a) Except as provided in par. (b), attics of combustible construction shall be divided into areas not greater than 3,200 square feet by firestopping as specified in s. ILHR 53.63 (1) (d).

1. Compartmentalization shall extend into the eave and soffit areas to provide a complete separation between compartments.

2. Panels for access openings in compartment walls shall be equipped with self-closing devices and shall normally be kept closed.

(b) Attic compartmentalization need not be provided in buildings completely protected, including the attic space, by an automatic fire sprinkler system.

(20) CLASS OF CONSTRUCTION SEPARATION. (a) Except as provided in par. (b) and s. ILHR 62.93, portions of buildings of different classes of construction, as specified in s. ILHR 51.03, shall be separated by fire division walls as specified in s. ILHR 51.02 (13) or the building classification will be reduced to the lowest class of construction utilized.

(b) Portions of health care facilities of different classes of construction, as specified in s. ILHR 51.03, shall be separated by 2-hour rated fire-resistive construction as specified in ss. ILHR 51.04 to 51.049 or the building classification shall be reduced to the lowest class of construction utilized.

History: Cr. Register, June, 1972, No. 198, eff. 1-1-73; r. (9) and (10), renum. (3) to be (4), (4), (5), (6), (7), (8) to be (6), (7), (8), (9), (10), am. (2) (a) cr. (3), (5), (11), (12), (13) and (14), Register, September, 1973, No. 213, eff. 10-1-73; am. (14) (d), Register, February, 1974, No. 218, eff. 3-1-74; r. and recr. (12) (a); am. (13) (c), Register, May, 1974, No. 221, eff. 6-1-

74; cr. (11) (c) and (15), Register, July, 1974, No. 223, eff. 8-1-74; cr. (16) and (17), Register, December, 1974, No. 228, eff. 1-1-75; am. (5) (a) 1 and (14) (e) 1, cr. (18), Register, December, 1975, No. 240, eff. 1-1-76; am. (16) (b), Register, July, 1976, No. 247, eff. 8-1-76; cr. (2) (c), Register, December, 1976, No. 252, eff. 1-1-77; am. (15) and cr. (19), Register, December, 1977, No. 264, eff. 1-1-78; r. (16) and (17), Register, May, 1978, No. 269, eff. 7-1-78; am. (4) (a), (18) and (19), cr. (15) (a) and (20), Register, December, 1978, No. 276, eff. 1-1-79; am. (11) (a) and (c) (intro.), (13) and (19), r. and recr. (6) (b), Register, January, 1980, No. 289, eff. 2-1-80; r. and recr. (11), am. (14) (a) 2, r. (14) (a) 3, Register, December, 1981, No. 312, eff. 1-1-82; reprinted to correct error in (14) (a) 2., Register, February, 1982, No. 314; am. (11) (a) and (19), Register, October, 1982, No. 322, eff. 11-1-82; cr. (4) (c) and (13) (c), r. (6), am. (11) (b) 3., (14) (a) 2. and (20), Register, December, 1983, No. 336, eff. 1-1-84; am. (4) (c) 2. c., (9), (11) (b) 3., (13) (c) 2., (14) (b) and (18) (b), r. and recr. (13) (a) 1., Register, August, 1985, No. 356, eff. 1-1-86.

ILHR 51.03 Classes of construction standards. (1) FIRE RESISTIVE TYPE A (NO. 1). (a) A building is of fire-resistive construction if all the walls, partitions, piers, columns, floors, ceilings, roof and stairs are built of noncombustible material, with a fire-resistive rating as specified in Table 51.03-A.

1. Concealed draft openings in columns, walls and partitions shall be firestopped with noncombustible material at each floor level.

(b) All buildings of this classification shall not be restricted in height.

(c) Stairs and stair platforms shall be constructed of noncombustible material.

(d) Doors and windows may be of wood except as otherwise specified in s. ILHR 51.02 (5), Table 51.03-B, ss. ILHR 51.17, 51.18, 51.19 and 51.20, or in the occupancy chapters of this code.

1. Doors leading into main public corridors other than rated exit corridors shall be noncombustible or 20-minute fire door assemblies, as specified in s. ILHR 51.047 or equivalent, unless otherwise specified above.

Note: Public corridors are intended to include principal corridors serving a floor and leading directly to building exits, but do not include communicating passageways within a given use area.

(e) Bays, oriels, and similar exterior projections from the walls shall be constructed of material with fire-resistive ratings as required for exterior walls.

(f) Mansards shall be constructed of noncombustible material or fire-retardant treated wood.

CLASSES OF CONSTRUCTION TABLE 51.03-A FIRE RESISTIVE RATINGS IN HOURS

BUILDING ELEMENT	MODIFYING CONDITIONS			TYPES OF CONSTRUCTION									APPLICABLE NOTES
	SEE NOTES f g	BLDG SETBACK DIS. TO P/L OR TO OTHER BLDG. ON SAME PROP.	BEARING OR NONBEARING	FIRE RESISTIVE TYPE A	FIRE RESISTIVE TYPE B	METAL FRAME PROTECTED	HEAVY TIMBER	EXTERIOR MASONRY, PROT.	EXTERIOR MASONRY, UNPROT.	METAL FRAME UNPROTECTED	WOOD FRAME PROTECTED	WOOD FRAME UNPROTECTED	
1. INTERIOR SUPPORTS (COLUMNS, PIERS, FRAME LEGS, POSTS)		Over 8 stories or more than 85 ft. in height		NC-4	NP	NP	NP	NP	NP	NP	NP	NP	a d
2.		8 stories or 85 ft. in height or less		NC-3	NC-2	See s. ILHR 51.03 (3) NC-1	See s. ILHR 51.03 (4) H.T. or 1	See s. ILHR 51.03 (5) 1	See s. ILHR 51.03 (5) 0	See s. ILHR 51.03 (6) NC-0	See s. ILHR 51.03 (7) 1	See s. ILHR 51.03 (8) 0	a d
3. FLOOR FRAMING (BEAMS, GIRDERS, JOISTS, SLABS, DECK)		More than 2 stories		NC-3	NC-2	See s. ILHR 51.03 (3) NC-1	See s. ILHR 51.03 (4) H.T. or 1	See s. ILHR 51.03 (5) 1	See s. ILHR 51.03 (5) 0	See s. ILHR 51.03 (6) NC-0	1	NP	a
4.		2 stories or less		NC-2	NC-1	NC-1	See s. ILHR 51.03 (4) H.T. or 1 or 0	1	0	See s. ILHR 51.03 (6) NC-0	1	0	a
5. ROOF FRAMING (TRUSSES, BEAMS, GIRDERS, JOISTS, FRAME RAFTERS, PURLINS, DECK)		Over 8 stories or more than 85 ft. in height		NC-2	NP	NP	NP	NP	NP	NP	NP	NP	a
6.		3 to 8 stories or 85 ft. in height or less		NC-2	NC-1-1/2	See s. ILHR 51.03 (3) NC-1	See s. ILHR 51.03 (4) H.T. or 1	See s. ILHR 51.03 (5) 1	See s. ILHR 51.03 (5) 0	See s. ILHR 51.03 (6) NC-0	1	NP	a
7.		2 stories, or under 35 ft. in height		NC-1	NC-1	NC-1	See s. ILHR 51.03 (4) H.T. or 1	See s. ILHR 51.03 (5) 1	See s. ILHR 51.03 (5) 0	NC-0	See s. ILHR 51.03 (7) 1	0	a
8.		1 story - roof framing more than 20 ft. above fl.		NC-0	See s. ILHR 51.03 (2) NC-0	NC-0	See s. ILHR 51.03 (4) H.T. or 1	0	0	0	0	0	a
9.		1 story - roof framing 20 ft. or less above fl.		NC-1	NC-1	NC-1	See s. ILHR 51.03 (4) H.T. or 1	1	0	0	See s. ILHR 51.03 (7) 1	0	a
10. ROOF COVERING				CLASS A	CLASS A	CLASS A	CLASS B	CLASS B	CLASS B	CLASS C	CLASS C	CLASS C	a
11. EXTERIOR WALLS & COURT WALLS		Less than 10 ft.	Bearing	NC-4	NC-3	NC-2	NC-2	2	2	NC-2	See s. ILHR 51.03(7)(e) NP	See s. ILHR 51.03(8)(d) NP	a d e f k
12.		3 stories									See s. ILHR 51.03(7)(f) NP	NP	a c d e
		2 stories or less	Bearing	NC-3	NC-2	NC-3/4	1	2	1	NC-0	1	NP	f k
13. (NOT INCLUDING INTERIOR FURRING ATTACHED TO INSIDE SURFACE OF WALL)		Over 30 ft.	Bearing	NC-2	NC-1	NC-0	1	2	1	NC-0	1	0	a c d e f k
14.		Less than 10 ft.	Nonbearing	NC-2	NC-2	NC-1	NC-1	2	1	NC-1	See s. ILHR 51.03(7)(e) NP	See s. ILHR 51.03(8)(d) NP	a d e f k
15.		3 stories									See s. ILHR 51.03(7)(f) NP	NP	a c d e
		2 stories or less	Nonbearing	NC-1	NC-1	NC-0	1	2	1	NC-0	1	0	f k
16.		Over 30 ft.	Nonbearing	NC-0	NC-0	NC-0	3/4	1	0	NC-0	1	0	a c d e f h k
17. INTERIOR WALLS BEARING				NC-3	NC-2	NC-1	1	1	1	NC-0	1	0	a j
18. PARTITIONS				NC-0	NC-0	NC-0	0	0	0	0	0	0	a j
19. REQUIRED EXIT CORRIDOR ENCLDS.		Over 3 stories		NC-2	NC-2	NC-1	2	2	1	1	1	1	a
20. FIRE ENCLOSURE (STAIRWAYS, ELEVATORS, VERTICAL SHAFTS)		3 stories or less		NC-2	NC-2	NC-2	2	2	NP	NP	NP	NP	a f
21. PENTHOUSE WALLS		Over 3 stories		NC-2	NC-2	NC-1	1	1	1	1	1	1	a f
22. PENTHOUSE ROOF				NC-0	NC-0	NC-0	0	NC-0 or 3/4	NC-0 or 3/4	0	0	0	a h
				NC-0	NC-0	NC-0	0	0	0	0	0	0	a b

KEY TO ABBREVIATIONS

NC - Noncombustible
NP - Not Permitted
H.T. - Heavy Timber
P/L - Property Line

a - See occupancy sections of the code for other basic requirements and more restrictive limitations.
b - Roof covering same as for main building.
c - Walls of solid wood 4 inches in thickness are acceptable as equal to one hour fire-resistive ratings.
d - Fire-resistive requirements also apply for those bracing members required for gravity loading.
e - Refer to Table 51.03-B for allowable areas for windows and other openings in exterior walls.
f - For exceptions refer to s. ILHR 51.02.
g - Setbacks and distances to P/L or other buildings on same property do not apply to P/L along streets.
h - Approved fire-retardant treated wood will be accepted in lieu of 3/4-hour fire-resistive ratings.
j - For openings in partitions and interior bearing walls, see s. ILHR 51.02.
k - Hourly ratings specified as for fire exposure from the inside of the building only.

KEY EXAMPLE TO READING CHART

0 = 0 (No Hour Rating)
1 = Combustible or Noncombustible 1 Hour Rating
NC-0 = Noncombustible 0 Hour Rating

(b) All outside railings which are more than 60 feet above grade shall be at least 6 feet high, measuring vertically from floor of platform or from nose of step. Such railings shall be of special design approved by the department, having not less than 4 longitudinal rails, and vertical lattice bars not more than 8 inches apart, and proper stiffening braces or brackets.

(9) LADDER TO ROOF. Every fire escape which extends higher than the second floor shall be provided with a ladder leading from the upper platform to the roof, unless the fire escape stairway leads to the roof. The ladder shall have stringers not less than 1¼ inch pipe, or not less than 2 x ½ inch flat bars, at least 17 inches apart in the clear. The rungs shall be not less than ½ inch square or ⅝ inch round bars, 14 inches center to center. The stringers shall be securely tied together at intervals no greater than every fifth rung. The stringers of each ladder shall extend not less than 4 feet above the roof coping and return to within 2 feet of the roof, with the top rung of the ladder level with the coping.

(10) OTHER TYPES OF FIRE ESCAPES. Sliding or chute fire escapes may be used, upon the approval of the department of industry, labor and human relations, in place of "A" or "B" fire escapes. Every sliding fire escape shall be provided with a ladder constructed as in sub. (9), extending from 5 feet above grade, to 4 feet above the roof coping.

History: 1-2-56; am. Register, December, 1962, No. 84, eff. 1-1-63; am. (1) (a), Register, February, 1971, No. 182, eff. 7-1-71; am. (7), Register, February, 1971, No. 182, eff. 3-1-71; r. and recr. 51.20 (1) (a) eff. 8-1-71 and exp. 1-1-72 and cr. (1) (a) eff. 1-1-72, Register, July, 1971, No. 187; am. (1) (a), Register, June, 1972, No. 198, eff. 7-1-72; am. (3) (intro. par.), Register, December, 1974, No. 228, eff. 1-1-75; am. (1) (a), Register, December, 1975, No. 240, eff. 1-1-76; am. (8) (intro.), Register, January, 1980, No. 289, eff. 2-1-80; am. (8) (b), Register, December, 1981, No. 312, eff. 1-1-82.

ILHR 51.21 Standpipe and hose systems. (1) GENERAL REQUIREMENTS. FP
All required standpipe and hose systems shall meet the requirements of this section.

Note: The department will accept installations conforming to the latest edition of NFPA No. 14—Standard for Installation of Standpipe and Hose Systems.

(2) CLASSES OF SERVICE. (a) *Class I - Fire department standpipes.* For use by fire departments and those trained in handling heavy fire streams from a 2½-inch hose.

(b) *Class II - First-aid standpipes.* For use primarily by occupants of a building until the arrival of the fire department (1½-inch hose).

(c) *Class III - Combination fire department and first-aid standpipes.* For use by either fire departments and those trained in handling heavy hose streams or by the building occupants.

(3) CLASS I - FIRE DEPARTMENT STANDPIPES. (a) *Where required.* Fire department standpipes shall be provided for all buildings exceeding 60 feet in height.

1. Required standpipes shall be installed as construction progresses, to make them available for fire department use in the topmost floor constructed. Temporary standpipes may be provided in place of permanent standpipes during the period of construction when approved by the local fire department.

(b) *Number of standpipes.* Standpipes shall be sufficient in number so that any part of every floor area can be reached within 30 feet by a nozzle

attached to 100 feet of hose connected to the standpipe in an unsprinklered building and 150 feet of hose in a sprinklered building.

(c) *Cross connections.* When 2 or more standpipes are required, they shall be cross connected and equipped with individual control valves. All control valves shall be of an approved indicating type valve. The valves shall be located so that the water supply to any standpipe riser can be shut off without interrupting the water supply to the remaining standpipes and be readily accessible to the fire department.

(d) *Location of outlets.* Hose outlets shall be located in stairway enclosures. Where stairways are not enclosed, outlets shall be at the inside of outside walls, within one foot of a smokeproof tower, interior stairway or fire escape. In buildings containing large interior areas, standpipes may be located at accessible interior locations.

(e) *Protection of standpipes.* Standpipes shall be protected against mechanical and fire damage. Dry standpipes shall be visible for inspection and not concealed.

Note: It is not the intent of this section to require standpipes to be protected with an hourly rated fire protection.

(f) *Size.* No required standpipe shall be less than 4 inches in diameter, and not less than 6 inches in diameter for standpipes in excess of 100 feet in height unless the building is completely sprinklered and the standpipe system is hydraulically designed in accordance with the requirements of sub. (6).

(g) *Hose valves and connections.* An approved 2½-inch hose-connection valve shall be located at each story, not less than 3 feet nor more than 6 feet above the floor level. Hose-connection valves shall be equipped with a tight-fitting cap on a chain and having lugs for a spanner wrench. When the building is completely sprinklered, and class II service is omitted, each standpipe outlet location shall be equipped with a 2½-inch hose valve, a 2½-inch by 1½-inch reducer, and a cap with an attached chain.

(h) *Hose threads.* All threads on hose connections shall be of national standard dimensions.

Note: Section 213.15, Stats., requires that all hose connections be fitted with the national standard hose threads adopted by the national fire protection association.

(i) *Fire department connection.* An approved fire department connection shall be installed on a 4-inch or larger pipe connection with each standpipe system. The connection shall be marked "Standpipe". If automatic fire sprinklers are also supplied by the hose connection, the sign shall read "Standpipe and Automatic Sprinkler". The elevation of the connection may be not less than 18 inches nor more than 42 inches above the sidewalk or ground. If municipal water is available at the building site, the fire department connection shall be located as close as possible to and within 150 feet of any fire hydrant.

(j) *Automatic water supply.* An automatic water supply for a wet standpipe system shall be designed to provide not less than the following capacity from top outlets at not less than 65 psi flowing pressure for a period of 30 minutes; 500 gpm for a single standpipe; 750 gpm for 2 interconnected standpipes; 1,000 gpm for larger systems. Any of the following supplies will be acceptable:

1. Public waterworks system where pressure and discharge capacity are adequate;
2. Approved automatic fire pump (or pumps);
3. Pressure tank;
4. Gravity tank;
5. Approved manually controlled fire pump operated by remote control devices at each hose outlet; or
6. Reservoirs.

(k) *Dry standpipes.* If only one standpipe is required, a dry standpipe may be used. A dry standpipe shall be limited to a single riser and shall not exceed 150 feet in height.

(4) CLASS II - FIRST-AID STANDPIPES. (a) *Where required.* First-aid standpipes shall be provided as required by the occupancy chapters of this code.

Note: See ss. ILHR 54.15, 55.33, 56.20 and 57.21.

(b) *Number and location.* Standpipes shall be sufficient in number so that any part of every floor area, including basements, can be reached within 30 feet by a nozzle attached to not more than 100 feet of hose connected to a standpipe.

1. Hose outlets shall be located in occupied areas and preferably in corridors or at interior columns.

(c) *Size.* No required standpipe shall be less than 2 inches in diameter for buildings 4 or less stories or 50 feet in height, and not less than 2½ inches in diameter for buildings exceeding 4 stories or 50 feet in height.

(d) *Hose valves and connections.* An approved 1½-inch hose valve shall be located not more than 5 feet above the floor level. Where the static pressure at any standpipe hose outlet exceeds 100 psi, an approved device shall be installed at the outlet to reduce the pressure with the required flow at the outlet to not more than 100 psi.

(e) *Hoses.* Not more than 100 feet of hose shall be attached to each outlet. Hoses shall be of an approved type, 1½-inches in diameter, with ½-inch solid stream or combination nozzle attached, and shall be located in approved cabinets, racks or reels. In locations where the use of a solid stream may contribute to the spread of fire by scattering the burning material or where the existence of flammable liquids make the use of spray stream desirable, combination nozzles which give a spray or a solid stream shall be provided instead of ½-inch nozzles.

(f) *Water supply.* An automatic water supply shall be provided. The water supply shall be designed for 100 gpm for 30 minutes with 65 psi flowing pressure at the top outlet. The water supply may be from a city connection, gravity tank, pressure tank or pump.

Note #1: The department will permit the domestic water supply to service class II standpipes provided no intervening control valves are installed to interrupt the service of the standpipe and a check valve is installed to prevent contamination of the domestic water supply.

Note #2: The department will permit pumps, other than fire pumps, provided the water supply meets the requirements of sub. (4) (f).

Note #3: See ch. ILHR 82 for requirements pertaining to cross connections.

(5) **CLASS III — COMBINED FIRE DEPARTMENT AND FIRST-AID STAND-PIPES.** (a) *Where permitted.* The features of class I and II service may be combined in a single system if served by an acceptable automatic water supply conforming to the requirements of sub. (3) (j).

(b) *Requirements.* Class III standpipes shall conform to the requirements of class I service except that 1½-inch outlets with a hose and 2½-inch outlets shall be provided on each floor and shall be installed to the requirements of the respective classes of service.

(6) **COMBINED AUTOMATIC SPRINKLER AND STANDPIPE SYSTEM.** (a) *Definition.* A combined system is a system where the vertical water piping serves both the automatic sprinkler system and the 2½-inch hose outlets of the standpipes used by the fire department. The combined system shall comply with the automatic sprinkler requirements of s. ILHR 51.23 and the standpipe and hose requirements of s. ILHR 51.21.

(b) *Water supply and riser size.* The minimum water supply and riser size for a combined system shall comply with the requirements of sub. (3) (f) and (j), except the minimum water supply for a combined system for a completely sprinklered, light hazard occupancy building shall be 500 gallons per minute. When the building is completely sprinklered, the risers may be sized by hydraulic calculations.

Note: NFPA No. 13—Standard for Installation of Sprinkler Systems, defines light hazard occupancy as occupancies where the quantity and/or combustibility is low and fires with relatively low rates of heat release are expected, such as: churches; clubs; educational; hospitals; institutional; libraries, except large stack rooms; museums; nursing or convalescent homes; offices, including data processing; residential; restaurant seating areas; theaters and auditoriums, excluding stages and prosceniums.

(c) *Connections.* Each connection from a vertical riser of a combined system shall be provided with an individual control valve of the same size as the outlet.

FP (7) MAINTENANCE. Standpipe systems and equipment, whether required by this code or not, shall be maintained in an operable condition.

History: 1-2-56; r. and recr. Register, December, 1976, No. 252, eff. 1-1-77; am. (7), Register, December, 1978, No. 276, eff. 1-1-79; am. (3) (i), Register, June, 1983, No. 330, eff. 7-1-83.

FP ILHR 51.22* Fire extinguishers. (1) **GENERAL.** All required fire extinguishers shall be approved by the department, and shall comply with the provisions of NFPA No. 10-1981 — Standard for Portable Fire Extinguishers.

(2) **INSTALLATION.** Fire extinguishers as specified in chs. ILHR 54-62 shall be installed as specified in NFPA No. 10-1981 — Standard for Portable Fire Extinguishers.

(3) **MAINTENANCE.** All portable fire extinguishers, whether required by chs. ILHR 54-62 or not, shall be maintained in operable condition as specified in NFPA No. 10-1981 — Standard for Portable Fire Extinguishers.

History: 1-1-56; am. Register, October, 1967, No. 142, eff. 11-1-67; r. and recr. Register, December, 1981, No. 312, eff. 1-1-82; am. Register, December, 1983, No. 336, eff. 1-1-84.

*See Appendix A for further explanatory material.

ILHR 51.23 Automatic sprinklers. (1) **GENERAL REQUIREMENTS.** (a) All automatic fire sprinkler systems shall be designed and installed in accordance with NFPA No. 13-1980, Standard for the Installation of Sprinkler Systems.

(b) The sprinkler system shall be so installed and maintained as to provide complete coverage for all portions of the building.

(c) Reinstallation of used sprinkler heads shall be prohibited.

(d) Approved secondhand devices other than sprinkler heads may be installed by special permission of the department.

Note: The department will accept equipment, materials and devices listed or labeled by Underwriters' Laboratories or approved by Factory Mutual. Other testing laboratories or inspection agencies will be recognized as an approved agency if accepted in writing by the department.

(2) **WATER SUPPLY.** (a) Approved automatic water supplies for the sprinkler system recognized by the department are listed below: **FP**

1. City water main;
2. Gravity or pressure tank;
3. Ground storage reservoir; or
4. Natural bodies of water approved by the department (lakes, rivers, streams, etc.).

(b) If the water supply has inadequate pressure, an approved fire pump or tank shall be provided. The design and installation of water supply facilities for gravity tanks, fire pumps, reservoirs or pressure tanks, and underground piping shall conform to NFPA No. 22, Standard for Water Tanks for Private Fire Protection; NFPA No. 20, Installation of Centrifugal Fire Pumps; and NFPA No. 24, Outside Protection [ILHR 51.27 (7a)].

(3) **BASEMENT SPRINKLERS.** Every basement sprinkler system shall also include sprinklers in all shafts (except elevator shafts) leading to the story above.

(4) **FIRE DEPARTMENT CONNECTION.** Every sprinkler system shall have an approved fire department connection as specified in NFPA 13-1980. The connection shall be marked "Sprinkler". If standpipes are also supplied by the hose connection, the sign shall read "Standpipe and Automatic Sprinkler". The elevation of the connection shall be not less than 18 inches nor more than 42 inches above the sidewalk or ground. If municipal water is available at the building site, the fire department connection shall be located as close as possible to and within 150 feet of any fire hydrant.

(5) **SPRINKLER ALARMS.** Every sprinkler system shall be provided with a suitable audible alarm. In all buildings over 60 feet in height, each sprinkler system on each floor shall be equipped with a separate water flow device connected to an alarm system.

(6) **MAINTENANCE.** (a) All installed automatic sprinkler systems, whether required by this code or not, shall be properly maintained for efficient service pursuant to NFPA No. 13A-1981—Standard for the Care and Maintenance of Sprinkler Systems. Owners or operators shall **FP**

be responsible for the condition of their sprinkler system and shall use due diligence in keeping the system in good operating condition. A copy of the inspection report as specified in NFPA No. 13A-1981 shall be kept and shall be made available, upon request, to the department or its authorized deputies.

(b) The requirements of par. (a) shall apply to all buildings in existence on the effective date of this section and to those buildings constructed thereafter.

Note: See ss. ILHR 81.10 (6) and 81.11 (9) and s. 145.165, Stats., for additional requirements pertaining to maintenance and repair or automatic fire sprinkler systems.

(7) **PARTIAL AUTOMATIC FIRE SPRINKLER SYSTEMS.** Partial automatic fire sprinkler systems may be connected without a fire department connection to the domestic water supply service or a first-aid standpipe or a fire department standpipe provided the following conditions are satisfied:

(a) The number of sprinkler heads per building does not exceed 20;

(b) The connection is equipped with an approved indicating valve with a monitor or an approved locking device and a check valve;

(c) The water pressure and volume is adequate to supply the required flow of the largest number of sprinkler heads in any one of the enclosed areas; and

(d) An audible alarm is provided to sound when the system is in operation.

Note: See ch. ILHR 82 for requirements pertaining to cross connections.

(8) **SUBSTITUTE AUTOMATIC FIRE SUPPRESSION SYSTEMS.** When approved by the department, substitute automatic fire suppression systems may be used in lieu of an automatic fire sprinkler system in areas where the use of water could cause unusual damage to equipment, or where water may have a limited effect or may be hazardous to use because of the nature of processes involved.

History: 1-2-56; r. and recr. Register, December, 1974, No. 228, eff. 1-1-75; cr. (7) (a), Register, December, 1976, No. 252, eff. 1-1-77; am. (6), Register, December, 1981, No. 312, eff. 1-1-82; r. and recr. (1), (4), (6) and (7), cr. (8), Register, June, 1983, No. 330, eff. 7-1-83; am. (6), Register, December, 1983, No. 336, eff. 1-1-84.

ILHR 51.24 Fire alarm systems. Interior fire alarm systems required under ss. ILHR 54.17, 56.19 and 57.17 shall be designed and constructed in conformity with the following requirements:

(1) All such alarm systems shall consist of operating stations on each floor of the building, including the basement, with bells, horns, or other approved sounding devices which are effective throughout the building. The system shall be so arranged that the operation of any one station will actuate all alarm devices connected to the system except in the case of a presignal system. Fire alarms shall be readily distinguishable from any other signalling devices used in the building. A system designed for fire alarm and paging service may be used if the design is such that fire alarm signals will have precedence over all others;

(a) In all buildings where a fire alarm system and a complete automatic sprinkler system are required, a water flow detecting device shall be provided to actuate the fire alarm system.

(2) Every fire alarm system shall be electrically operated or activated by non-combustible, nontoxic gas. Electrically operated systems shall be operated on closed circuit current under constant electrical supervision, so arranged that upon a circuit opening and remaining open or in case of a ground or short circuit in the undergrounded conductor, audible trouble signals will be given instantly. Gas-activated systems shall be mechanically supervised and under constant gas pressure, so arranged that in case of a pressure drop an audible trouble signal will be given instantly. Means shall be provided for testing purposes;

(3) (a) Except as provided in par. (b), coded fire alarm systems shall be provided in buildings more than 3 stories in height and the systems shall be so arranged that the code transmitted shall indicate the location and story of the structure in which the signal originated;

(b) The department shall approve noncoded continuous sounding fire alarm systems under constant electric or gas activated supervision in apartment buildings.

(4) Operating stations shall be prominently located in an accessible position at all required exit doors and required exit stairways. Operating stations shall be of an approved type and shall be conspicuously identified. All such operating stations shall be of a type, which after being operated, will indicate that an alarm has been sent therefrom until reset by an authorized means. (Operating stations having a "Break Glass" panel will be acceptable. On coded systems having a device to permanently record the transmission of an alarm, "Open Door" type stations may be used). The fire alarm operating stations shall be mounted not less than 3 feet nor more than 4 feet above the finished floor as measured from the floor to the center of the box;

(5) All alarm systems shall be tested at least once a month and a record of the tests shall be kept; **FP**

(6) Existing fire alarm systems that are effective in operation will be accepted if approved by the department;

(7) The gas for operation of non-combustible, non-toxic gas activated fire alarm systems shall be supplied from approved pressure cylinders on the premises. The cylinders shall have sufficient capacity and pressure to properly operate all sounding devices connected to the system for a period of not less than 10 minutes. Cylinders shall be removed for recharging immediately after use and shall be replaced by fully charged cylinders;

(8) Spare cylinders shall be kept on the premises at all times for immediate replacement and separate cylinders for testing shall be incorporated in the system;

(9) Tubing in connection with non-combustible, non-toxic gas activated fire alarm systems shall be installed in rigid metal conduit, flexible metal conduit, or surface metal raceways where subject to mechanical injury. Non-corrosive metallic tubing not less than 3/16" in diameter which will withstand a bursting pressure of not less than 500 pounds per square inch shall be used. The maximum length of 3/16" tubing shall not exceed 300 feet between charged cylinders. All tubing and other compo-

ment parts shall be installed by skilled workers in accordance with the provisions of this code; and

Note: See Wisconsin State Electrical Code, Volume 2, ch. ILHR 16.

FP (10) MAINTENANCE. All fire alarm systems, whether required by this code or not, shall be maintained in an operable condition.

History: 1-2-56; am. (4) (a), Register, November, 1963, No. 95, eff. 12-1-63; am. Register, August, 1964, No. 104, eff. 9-1-64; r. (10), (11) and (12), Register, December, 1975, No. 240, eff. 1-1-76; cr. (1) (a) and am. intro. and (2), Register, December, 1976, No. 252, eff. 1-1-77; am. (intro.) and (4), r. (3) (a), Register, January, 1980, No. 289, eff. 2-1-80; am. (3) and (6), cr. (10), Register, December, 1981, No. 312, eff. 1-1-82; am. (5), Register, August, 1985, No. 356, eff. 1-1-86.

ILHR 51.245 Smoke detectors. (1) **GENERAL REQUIREMENTS.** All required smoke detectors shall be approved by the department and shall comply with the provisions of NFPA No. 72E-1982 — Standard on Automatic Fire Detectors or NFPA No. 74-1980 — Household Fire Warning Equipment.

FP (2) INSTALLATION. (a) Smoke detectors and smoke detector systems shall be installed in accordance with the provisions of NFPA No. 72E-1982 — Standard on Automatic Fire Detectors or NFPA No. 74-1980 — Household Fire Warning Equipment and in accordance with the manufacturer's directions and specifications.

(b) Except as provided in s. ILHR 57.16 (2) (b), all smoke detectors interconnected with each other or with the manual fire alarm system shall be installed in accordance with the provisions of NFPA No. 72A-1979 — Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems for Guard's Tour, Fire Alarm and Supervisory Service. Where smoke detectors are interconnected with the manual fire alarm system, the smoke detectors shall be wired in accordance with the provisions specified in s. ILHR 16.34.

FP (3) MAINTENANCE. (a) The owner shall be responsible for maintaining the smoke detectors and the smoke detection system in good working order.

(b) Tenants shall be responsible for informing the owner, in writing, of any smoke detector malfunction, including the need for a new battery.

(c) The owner shall have 5 days upon receipt of written notice from the tenant to repair or replace the smoke detector or replace the battery. The owner shall check batteries at the beginning of a new lease and shall replace the battery at least annually.

(d) The owner shall furnish to the tenant written notice of the responsibilities of the tenant and the obligations of the owner regarding smoke detector maintenance.

History: Cr. Register, December, 1981, No. 312, eff. 1-1-82; am. (2) and (3) (c), Register, October, 1982, No. 322, eff. 11-1-82; am. (1) and (2) (a) Register, December, 1983, No. 336, eff. 1-1-84.

ILHR 51.25 Adoption of ASTM standards. Pursuant to s. 227.025, Stats., the attorney general and the revisor of statutes have consented to the incorporation by reference of the following standards of the American Society of Testing and Materials (ASTM), 1916 Race Street, Philadelphia, PA 19103. Copies of the standards in reference are on file in the

SUM CONCRETE, ANSI A59.1-1968 (R-1972); SPECIFICATION FOR VERMICULITE CONCRETE ROOFS AND SLABS ON GRADE, ANSI A122.1-1965; DIRECT GAS-FIRED MAKE-UP AIR HEATERS, ANSI Z83.4-1980; PERFORMANCE SPECIFICATIONS AND METHODS OF TESTING FOR SAFETY GLAZING MATERIALS USED IN BUILDINGS, ANSI Z97.1-1975.

(6) American Welding Society, P.O. Box 351040, Miami, Florida 33135, STRUCTURAL WELDING CODE-STEEL, AWS D1.1-84; STRUCTURAL WELDING CODE-SHEET STEEL, AWS D1.3-81.

(6a) American Wood Preservers Bureau, 2772 S. Randolph St., P.O. Box 6085, Arlington, Virginia 22206, STANDARD FOR SOFTWOOD LUMBER, TIMBER AND PLYWOOD PRESSURE TREATED WITH WATER-BORNE PRESERVATIVES FOR ABOVE GROUND USE, AWPB standard LP-2, 1980; STANDARD FOR SOFTWOOD LUMBER, TIMBER AND PLYWOOD PRESSURE TREATED WITH WATER-BORNE PRESERVATIVES FOR GROUND CONTACT USE, AWPB standard LP-22, 1980; QUALITY CONTROL PROGRAM FOR SOFTWOOD LUMBER, TIMBER AND PLYWOOD PRESSURE TREATED WITH WATER-BORNE PRESERVATIVES FOR GROUND CONTACT USE IN RESIDENTIAL AND LIGHT COMMERCIAL FOUNDATIONS, AWPB standard FDN, 1980.

(7) National Fire Protection Association, Batterymarch Park, Quincy, Mass. 02269;

(a) STANDARD FOR PORTABLE FIRE EXTINGUISHERS, NFPA No. 10-1984;

(b) STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS, NFPA No. 13-1983;

(c) STANDARD FOR THE CARE AND MAINTENANCE OF SPRINKLER SYSTEMS, NFPA No. 13A-1981;

(d) STANDARD FOR THE INSTALLATION OF CENTRIFUGAL FIRE PUMPS, NFPA No. 20-1983;

(e) STANDARD FOR WATER TANKS FOR PRIVATE FIRE PROTECTION, NFPA No. 22-1981;

(f) STANDARD FOR OUTSIDE PROTECTION, NFPA No. 24-1984;

(g) STANDARD FOR THE INSTALLATION OF OIL-BURNING EQUIPMENT, NFPA No. 31-1983;

(h) NATIONAL FUEL GAS CODE, NFPA No. 54-1984;

(i) STANDARD FOR CENTRAL STATION PROTECTIVE SIGNALING SYSTEMS, NFPA No. 71-1982;

(j) STANDARD FOR THE INSTALLATION, MAINTENANCE AND USE OF LOCAL PROTECTIVE SIGNALING SYSTEMS FOR GUARD'S TOUR, FIRE ALARM AND SUPERVISORY SERVICE, NFPA No. 72A-1979;

(k) STANDARD FOR AUXILIARY PROTECTIVE SIGNALING SYSTEMS, NFPA No. 72B-1979;

(l) STANDARD FOR REMOTE STATION PROTECTIVE SIGNALING SYSTEMS, NFPA No. 72C-1982;

(m) STANDARD FOR PROPRIETARY PROTECTIVE SIGNALING SYSTEMS, NFPA No. 72D-1979;

(n) STANDARD ON AUTOMATIC FIRE DETECTORS, NFPA No. 72E-1982;

(o) STANDARD FOR HOUSEHOLD FIRE WARNING EQUIPMENT, NFPA No. 74-1984;

(p) STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS, NFPA No. 90A-1981;

(q) STANDARD FOR CHIMNEYS, FIREPLACES, VENTS AND SOLID FUEL BURNING APPLIANCES, NFPA No. 211-1984.

(8) National Forest Products Association, 1619 Massachusetts Ave. NW, Washington, D.C. 20036, NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION, 1982 edition, with amendments to sections 2.2.5.3, 4.1.7 and 4.2.2, including DESIGN VALUES FOR WOOD CONSTRUCTION, a March, 1982 supplement to the 1982 edition of National Design Specification for Wood Construction; THE ALL-WEATHER WOOD FOUNDATION SYSTEM, BASIC REQUIREMENTS, Technical Report No. 7, Revised March, 1982, with amendments to Article 3.3.1 of section 3.3.

(9) Steel Joist Institute, Suite A, 1205 48th Ave. North, Myrtle Beach, South Carolina 29577, STANDARD SPECIFICATIONS, LOAD TABLES AND WEIGHT TABLES FOR STEEL JOISTS AND JOIST GIRDERS, 1984.

(10) Truss Plate Institute, Inc., 583 D'onofrio Dr., Suite 200, Madison, Wisconsin 53719, DESIGN SPECIFICATION FOR METAL PLATE CONNECTED WOOD TRUSSES, TPI-85.

(11) American Plywood Association, 7011 South 19th Street, Tacoma, Washington 98460, U.S. PRODUCT STANDARD FOR CONSTRUCTION AND INDUSTRIAL PLYWOOD, PS 1-74.

(12) Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, GUIDELINES FOR CONSTRUCTION AND EQUIPMENT FOR HOSPITALS AND MEDICAL FACILITIES, DHHS PUBLICATION No. (HRS-M-HF) 84-1.

(14) American Society of Heating, Refrigerating and Air Conditioning Engineers, 1791 Tullie Circle NE, Atlanta, Georgia 30329, HANDBOOK OF FUNDAMENTALS, 1977; METHODS OF TESTING AIR-CLEANING DEVICES USED IN GENERAL VENTILATION FOR REMOVING PARTICULATE MATTER, ASHRAE STANDARD No. 52-76.

(15) Underwriters' Laboratories, Inc., 333 Pfingsten Road, Northbrook, Illinois 60062, FACTORY-MADE AIR DUCTS AND CONNECTORS, UL STANDARD No. 181-1981, sixth edition including revisions dated March 19, 1984; OUTLINE OF INVESTIGATION FOR ROOF DECK CONSTRUCTION, UL No. 1256, June 15, 1979.

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(16) Factory Mutual, Inc., 1151 Boston-Providence Turnpike, Norwood, Mass. 02062, APPROVAL STANDARD FOR CLASS I INSULATED STEEL DECK ROOFS, FM Standard 4450, Revised August 5, 1977.

History: Cr. Register, July, 1974, No. 223, eff. 1-1-75, am. (5) and (10), cr. (7a), Register, December, 1974, No. 228, eff. 1-1-75; am. (2) and r. (7), Register, December, 1976, No. 252, eff. 1-1-77; cr. (6a) and am. (8), Register, December, 1978, No. 276, eff. 1-1-79; am. (10), Register, February, 1979, No. 278, eff. 3-1-79; am. (2), (6), (7a), (9) and (10), Register, January, 1980, No. 289, eff. 2-1-80; am. (1) and (3) to (10), r. and recr. (11), cr. (12) to (15), Register, December, 1981, No. 312, eff. 1-1-82; cr. (12) to (15), Register, February, 1982, No. 314, eff. 3-1-82; am. (7a), Register, October, 1982, No. 322, eff. 11-1-82; am. (7a), Register, June, 1983, No. 330, eff. 7-1-83; am. (5), (7a) and (8), r. and recr. (15), cr. (16), Register, December, 1983, No. 336, eff. 1-1-84; am. (6), (9), (10), (12) and (15), renum. (7a) to be (7) and am., r. (13), Register, August, 1985, No. 356, eff. 1-1-86.