



REFERENCE STANDARD RS 17
FIRE ALARMS, DETECTION AND EXTINGUISHING EQUIPMENT
***LIST OF REFERENCED NATIONAL STANDARDS**

ANSI/NFiPA No. 13	Standard for the Installation of Sprinkler System, as Modified	1989
**ANSI/NFiPA No. 13R	Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height	1994
**ANSI/NFiPA No. 13D	Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes.....	1994
ANSI/NFiPA No. 214	Standard for Water-Cooling Towers	1988
***ANSI/NFPA No. 72	National Fire Alarm Code	1993
ANSI/ASME B16.4	Cast-Iron Threaded Fittings, Class 125 and 250	1985
UL No. 193	Alarm Valves for Fire-Protection Service (Revision 9/88).....	1988
UL No. 260	Dry Pipe and Deluge Valves for Fire Protection Service.....	1988
UL No. 262	Gate Valves for Fire-Protection Service	1988
UL No. 312	Check Valves for Fire-Protection Service (Revision 10/89).....	1988
UL No. 668	Hose Valves for Fire-Protection Service	****1988
UL No. 753	Alarm Accessories for Automatic Water-Supply Control Valves for Fire-Protection Service (Revision 8/89).....	1989
UL No. 789	Indicator Posts for Fire-Protection Service (Revision 3/89).....	1987
UL No. 1091	Butterfly Valves for Fire-Protection Service	1986
UL No. 1468	Direct-Acting Pressure-Reducing and Pressure-Control Valves for Fire-Protection Service... 1985	
UL No. 1486	Quick Opening Devices for Dry Pipe Valves for Fire-Protection Service (Revision 7/85).. 1979	
UL No. 1726	Automatic Drain Valves for Standpipe Systems (Revision 9/88)	1985
UL No. 1739	Pilot-Operated Pressure-Control Valves for Fire-Protection Service.....	1988
ANSI A21.10/AWWA C110	Ductile-Iron and Grey-Iron Fittings, 3-inch through 48-inch for Water and Other Liquids. 1987	
ANSI A21.11/AWWA C111	Rubber Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings..... 1985	
***ANSI/ASTM A234	Specification for Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.....	1988
ANSI/NFiPA No. 22	Standard for Water Tanks for Private Fire Protection	1987
UL No. 217	Single and Multiple Station Smoke Detectors including Revision of February 19, 1989... 1989	
ANSI/NFiPA No. 74	Standard for the Installation, Maintenance, and Use of Household Fire Warning Equipment, as Modified	1989
ANSI/NFiPA No. 20	Installation of Centrifugal Fire Pumps	1990
ANSI/NFiPA No. 231	Standard of Indoor General Storage	1990
ANSI/NFiPA No. 231C	Standard for Rack Storage of Materials	1986

*310-90 BCR
 **DOB 6-23-99
 ***DOB 1-9-02
 ****As enacted but "1989" probably intended.

Reference Standard 17

***REFERENCE STANDARD RS 17-1
STANDPIPE SYSTEM CONSTRUCTION**

1. Materials for Standpipe Systems-

(a) Pipe-

(1) Pipe for standpipe systems shall be in accordance with table RS 17-1-1, and shall conform to the standards of table RS 16-1, of reference standard RS-16.

(2) Pipe for buried sections of the standpipe system, whether inside or outside of the building, shall be red brass, hard temper type “K” copper tubing, galvanized wrought iron, galvanized steel, cast iron, ductile iron, or approved equivalent material. All such pipe, other than cast iron, shall be adequately wrapped or otherwise

protected against corrosion.

(3) The name of the manufacturer and the pressure to which the pipe was tested shall be permanently and legibly indicated on all pipe used in standpipe systems.

(4) Only new pipe shall be used in standpipe systems.

(b) Fittings-

(1) Fittings used in standpipe systems above ground shall be malleable cast iron, ductile iron or cast steel or approved equivalent conforming to reference standard RS 17-6.

(2) Fittings used in standpipe systems underground shall be cast iron or ductile iron or approved equivalent conforming to reference standards RS 17-7 or RS 17-8.

(3) Pressure ratings shall be cast in or on the fittings. (See table RS 17-1-1 for required ratings.)

*** TABLE RS 17-1-1
REQUIRED RATINGS OF PIPE, FITTINGS AND VALVES IN STANDPIPE SYSTEMS FOR VARIOUS
HEIGHTS OF BUILDINGS ^{c,d}**

Distance from Upper Tank Check to 1 st Floor or Fire Pump (ft.)	Class of 2 ½ Hose Outlet Valves	Type of Pipe	Check and Fittings (wwp in psi)	Gate Valves (wwp in psi)
0 to 115	A ^a	Schedule 10 or 40 carbon steel	300	175
115 to 270	A ^a	Schedule 10 or 40 carbon steel	300	250
270 to 425	B ^b	Schedule 40 carbon steel	350	350
425 to 657	B ^b	Schedule 40 carbon steel	500	500
657 to 1,112	B ^b	Schedule 80 carbon steel	800	800
**1,122 and over	B ^b	Schedule 80 carbon steel	1,000	1,000

Notes.-

^aFor installation in buildings not exceeding 300 ft. in height or the uppermost 300 ft. in taller buildings. Valve shall close tightly against 300 psi normal hydraulic pressure and shall withstand a hydraulic test pressure of 750 psi.

^bFor installation in the lower portions of buildings exceeding 300 ft. in height. Valve shall close tightly against 400 psi normal hydraulic pressure and shall withstand a hydraulic test pressure at 1,250 psi.

^cSix inches and larger section and riser control valves shall have a valved bypass.

^dSiamese connections shall be rated for the same pressure as is required for interior fittings and valves.

***310-90 BCR**

****As enacted but “1,112” probably intended**

(4) Fittings used in standpipe systems that are of welded construction shall be of a type conforming to reference standard RS 17-9 for welding purposes.

(5) Approved mechanical couplings such as cut groove, rolled groove and mechanical tees may be used in the standpipe system. Fittings used in conjunction with the coupling shall be designed for use with the coupling.

(c) Valves-

(1) Valves and related products used in fire protection shall be approved and comply with reference standard RS 17-6A.

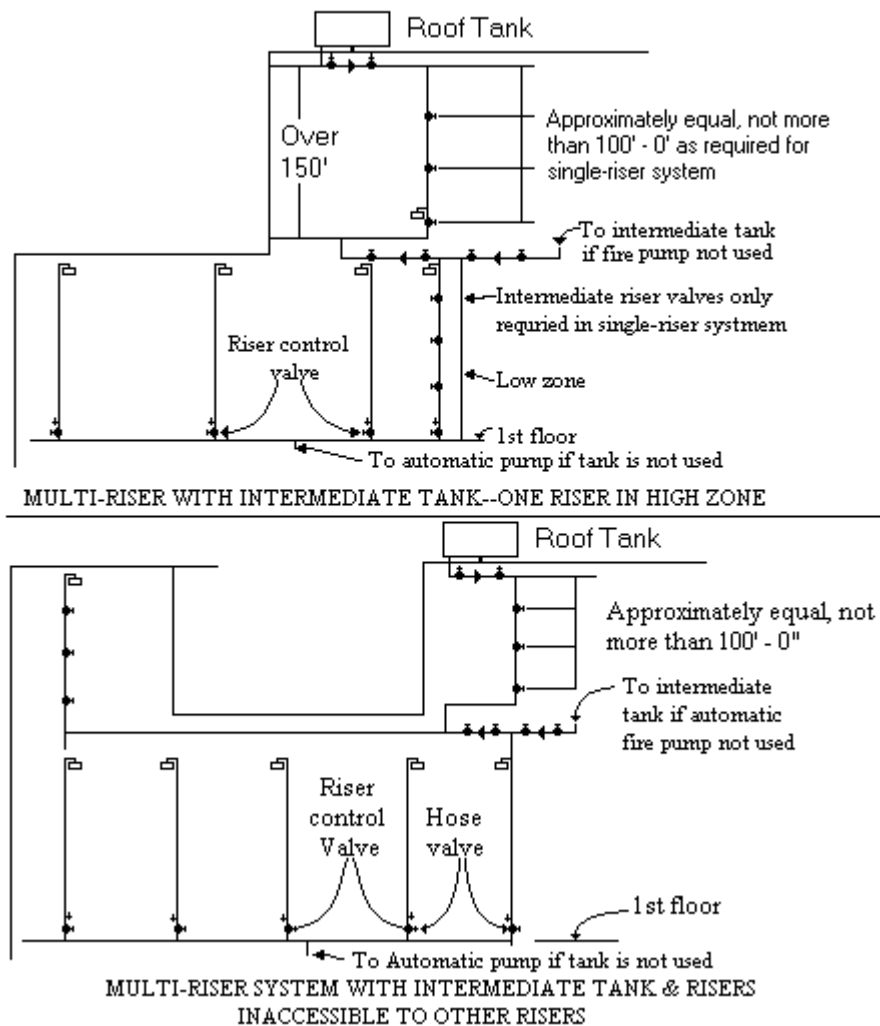
(2) O. S. & Y. indicating valves (with indicator readily visible from the floor) shall be provided to permit any riser or other section to be shut off while remaining risers or sections continue in use. Valves shall be

flanged, mechanically coupled, or wafer type and with bodies of cast iron, ductile iron, cast steel or approved equivalent material having nonferrous metal seat rings. See Table 17-1-1 for required ratings and Figures RS 17-1-1 and RS 17-1-2 for valve locations.

(3) In single riser systems, or where a single riser extends through an upper portion of the building supplying hose outlet valves more than 150 ft. above the curb level, section valves shall be installed in the single riser at the floor where the single riser starts and at increments of not more than 100 ft. above the first valve. The section valve or valves in the upper section of the riser shall be located so as to divide the riser into increments as shown in figure RS 17-1-1, and RS 17-1-2.

Reference Standard 17

Figure RS 17-1-1. Riser and Intermediate Valves (Multi-Riser System).



(4) Riser control valves, shall where practical, be located within a required stair enclosure serving the entrance floor. Where the stair enclosure extends to the basement or cellar, the riser control valve may be located within the stair enclosure at or in, the basement or cellar ceiling, providing that a sign indicating the valve location is installed within the stair enclosure at the entrance floor. The hose outlet valve for the entrance floor shall be located on the riser side of the riser control valve. Riser control valves shall not be required on a vertical line supplying one (1) or two (2) hose outlet valves.

(5) Where riser control or section valves are located outside of a required stair enclosure, the valves shall be of such type and so installed so as to be remotely operated by either electric motors or hydraulic means. The remote control shall be from either the entrance floor or from a fire pump room. Operating devices shall be grouped, suitably housed, and kept locked with

a fire department lock and key. The door of the housing shall be embossed to indicate the purpose of the device. Instructions for operating the remote valves by the control device shall be legible, detailed, and complete, and shall be permanently secured to the inner face of the door.

(6) Each valve shall be so designed and installed as to permit its manual operation at the valve location. Pressure ratings and the name of the manufacturer shall be cast raised or depressed on each valve used in the system.

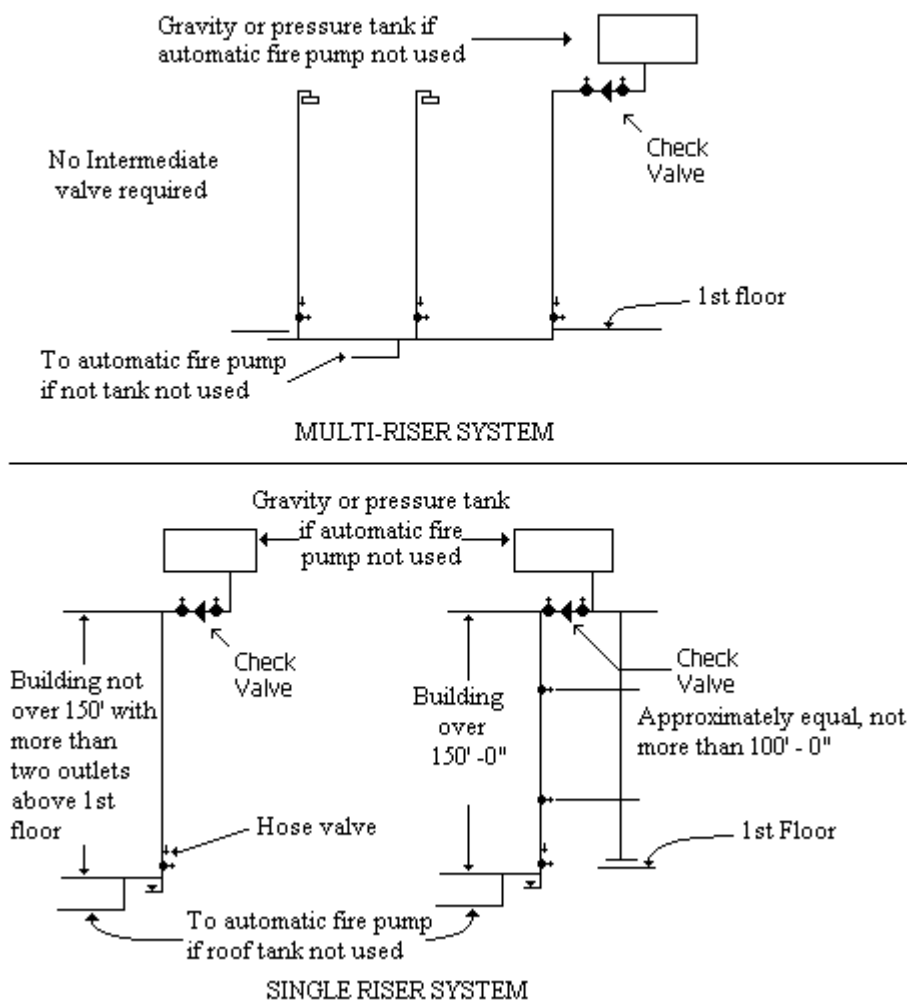
(7) The position of each remotely controlled valve, whether opened or closed, shall be indicated at its remote control point and also at the valve.

(8) Valves shall be readily accessible for inspection, repair, and use.

If the valve is placed so that its operating mechanism is more than 7 ft. above a floor or stair landing, a 12 in. wide wrought iron, steel or equivalent ladder securely fastened shall be provided for access to the valve. In

Reference Standard 17

Figure RS 17-1-2 Riser and Intermediate Valves
(Single and Multi-Riser System).



lieu of a ladder, chain operated mechanisms are permissible and shall be padlocked securely in place.

(9) Each control valve shall be conspicuously marked with the number assigned to it on the riser diagram for the standpipe system. Metal numbered tags at least 2 in. in diameter shall be securely attached to the valve. Each valve shall have a metal sign stating "STANDPIPE CONTROL VALVE" securely hung from the valve.

(10) Each control valve not controlled shall be sealed with a lock and chain in its normal position. If the normal position is the closed position, a metal placard stating such fact shall be conspicuously attached to the valve.

(d) Check valves.-(1) Check valves shall be flanged, mechanically coupled, or wafer type and be cast iron, ductile iron, cast steel or approved equivalent materials having nonferrous metal seat rings and bearings. Swing-type valves shall be installed horizontally in pipes from each siamese hose connection, and in piping from each tank, pump, and city water connection. Spring loaded check valves may be installed in the vertical or horizontal position on the discharge side of

fire pumps and tank connections.

(2) Check valves other than those in siamese and fire pump line shall be provided with an O. S. & Y. or indicating shutoff valve (with indicator readily visible from the floor) that is flanged, mechanically coupled or wafer type and connected to the inlet and outlet of such check valves. The valves on the suction and discharge of the fire pump shall be deemed to comply with this requirement when the discharge valve is placed on the discharge side of the check valve. One of the shutoff valves placed on each side of the tank check valve may be of the remote control type, and when used, shall be on the downstream side of such check valve.

(e) Supports.-Piping in standpipe systems shall be adequately supported by clamps, hangers, or other supporting devices.

2. Siamese Connections.-

(a) Design and construction.-

(1) Siamese connections shall have a swing-type check valve in each outlet branch unless such connection is at the

Reference Standard 17

shore end of a standpipe system also supplied by a siamese hose connection of the type specified for fireboat use.

(2) Siamese connections for fireboat use shall have two 3 1/2 in. swivels with fire department female threads. All other siamese hose connections, except those of the shore end type, shall have two 3 in. swivels with fire department female threads.

(3) All shore end siamese connections shall have 3 in. male hose threads and shall be subject to the approval of the fire department. In lieu of a check valve, each branch may have a drip and a long stem valve, which shall be located within the structure or otherwise protected against freezing. No siamese connections provided for fireboat use shall be installed in any standpipe system whose water supply is taken from the city water mains.

(b) Marking.-Each siamese connection shall be provided with caps painted red, and shall have the word "STANDPIPE" in letters 1 in. high and 1/8 in. deep cast in the body or on a nonferrous metal plate secured to the connection or mounted on the wall in a visible location, except that caps of each siamese connection used for combination standpipe and sprinkler systems shall be painted yellow and the words shall read

"COMBINATION STANDPIPE AND SPRINKLER SYSTEMS".

(c) Location.-

(1) Siamese connections shall be placed between 18 in. and 36 in. above the sidewalk level.

(2) Siamese connections shall be of the flush or free standing type, and with the exception of the swivel caps, shall not project beyond the street property line. The riser pipe to a free standing siamese connection shall be red brass. When siamese connections are installed in wall recesses, the recesses shall be of ample size to permit convenient hose attachment.

(d) Check valve.-Each siamese connection shall be provided with a swing-type check valve inside of the building or in a valve pit outside of the building.

(e) Drip valve.-A 3/4 in. automatic ball drip valve shall be placed between the siamese connection and the check valve, except that on a fireboat siamese connection, a 1/2 in. open drip without a shutoff may be used. Automatic ball drips shall be placed in the horizontal position.

**Local Law 5-1973*

3. Hose Stations.-

(a) Hose outlet valves.-

(1) On each floor at each riser, the required 2 1/2 in. angle hose valve shall be of a class as indicated in Table RS 17-1-1.

(2) At the top of the highest riser there shall be provided, above the main roof level, a three way manifold equipped with three 2 1/2 in. hose valves with hose valve caps. The lowest valve shall be located with the hose end at least 18 in. above the roof and the highest valve with the hose end not more than 60 in. above the roof. The manifold may be set in a horizontal or

vertical position, provided the hose outlets are set back between 18 in. and 60 in. above the roof level.

(3) Where the manifold is located other than within a heated stair enclosure, the control valve shall be located in a horizontal run of piping below the roof, with a long stem extending through the roof and equipped with a wheel handle at its upper end at least 12 in. above the roof. Between the control valve and the manifold there shall be provided within the heated space a 1/2 in. open drip or a 3/4 in. automatic ball drip, with the drip pipe extended to spill over a plumbing fixture or drain.

(b) Stations within stair enclosures.-

(1) In occupancies where a 2 1/2 in. fire hose is mandatory, the hose shall be connected to the 2 1/2 in. hose valve within the stair enclosure.

(2) In occupancies where 1 1/2 in. fire hose is permitted, a 2 1/2 in. x 1 1/2 in. brass or bronze non-swivel reducing coupling shall be attached to the 2 1/2 in. hose valve or an auxiliary hose station may be provided.

(c) Branch sizes to hose stations.-

(1) The branch size shall be predicated on the developed length from the riser or cross connection to the required 2 1/2 in. hose valve station as follows:

Up to 4 ft. - 2 1/2 in.

Over 4 ft.- 3 in. to 25 ft.

Over 25 ft. - 4 in.

(2) No valve shall be placed between the hose station valve and the riser or cross connection, except that on branches that serve three (3) or more hose stations, a valve shall be provided at the riser or cross connection.

(3) Not more than one (1) hose outlet shall be supplied from a 2 1/2 in. or 3 in. branch.

(d) Auxiliary hose stations branch size.-

(1) Branch piping from the required riser to an auxiliary hose station may be 2 1/2 in. I.P.S., and no valve shall be installed in the branch pipe with the exception of the 1 1/2 in. hose valve at the auxiliary hose station.

(e) Size, type and quality of hose.-

(1) At each hose station, hose shall be provided of a size, type and quality as required by the provisions of the building code.

(2) Hose couplings shall be of brass construction or approved equivalent materials with Fire Department threads.

(f) Nozzles.-

(1) Nozzles on 2 1/2 in. hose, except for yard hydrants, shall be at least 15 in. in length, and shall have a smooth bore with a 1 in. or 1 1/8 in. discharge orifice.

(2) Nozzles for hose used on yard hydrant systems shall be equipped with a playpipe conforming to the requirements of the Fire Department.

(3) Where 1 1/2 in. hose is within the stair enclosure, the nozzle may be a 1/2 in. smooth bore nozzle at least 12 in. in length or an adjustable combination fog nozzle.

(4) Nozzles at auxiliary hose stations shall be Fire Department approved adjustable combination fog nozzles.

(5) All nozzles shall be of brass, cast iron, aluminum or

Reference Standard 17

approved equivalent materials with Fire Department threads.

(g) Hose and valve cabinets.-

- (1) When the hose is kept in a cabinet, such cabinet shall be equipped with a single swinging door that shall have at least an 8 in. high panel of clear wired glass at the level of the hose valve and rack. The door width shall be the full inside width of the cabinet, and the glass panel shall be at least 90 percent of the width of the door. Where an extinguisher or other appurtenance are installed within the cabinet, the door shall have clear wire glass panel the full 90 percent of the door areas.
- (2) The hose valve within a stair enclosure may be kept in a cabinet. Such cabinet shall be equipped with a single swinging door that shall have a clear wired glass panel 90 percent of the door area. The valve shall be placed in the cabinet to permit coupling of 2 1/2 in. hose to the valve without causing kinks in the hose.
- (3) Each cabinet shall be readily accessible and the door shall be kept unlocked.
- (4) Cabinets may have solid metal doors when located in the entrance hall of a building. All such hose cabinets or closets shall be permanently marked "FIRE HOSE" across the door panel in red letters at least 1 in. high and shall not be used for any other purpose but concealing the hose station.

(h) Hose rack.-

- (1) The hose at each outlet shall be kept upon a hose rack firmly supported and placed between 5 ft. and 6 ft.-6 in. above the floor or landing.
- (2) The use of dump or reel-type racks is prohibited.

4. Tanks in Standpipe System.-

(a) Construction and support of tanks.-Tanks for the standpipe system supply shall be constructed and supported in accordance with the provisions of Reference Standard RS 16, Reference Standard RS 17-2, and applicable provisions of the building code for loads and structural work.

(b) Combination tanks.-Gravity tanks may be used to provide the required primary water supply to the standpipe system and may also be used to supply automatic sprinkler and/or domestic water in a building provided all the following conditions are met:

- (1) The connections to the tank are made in such a manner as to provide the required sprinkler and/or fire standpipe reserve. The domestic supply is above the sprinkler and/or standpipe reserve. The standpipe reserve is above the sprinkler reserve. Where a standpipe riser is used to supply water to a combination sprinkler and standpipe system as permitted, the connection to the tank shall be made in such a manner as to provide the required sprinkler or standpipe reserve, whichever is greater.

**Local Law 5-1973*

- (2) The connections to the system are made outside of the tank. When connections or piping are installed inside

the tank, the piping shall be assembled without couplings and shall be of red brass or approved equivalent material in accordance with Reference Standard RS-16.

- (3) The tank is filled by means of an automatic pump at a rate of not less than 65 gpm.

(c) Filling of tanks.-

(1) Pressure or gravity tanks shall be filled at the rate of at least 65 gpm. Pipes used to fill the tanks shall not be used for any other purpose; nor shall required fire pumps be used for filling purposes.

(2) Where there is sufficient pressure in the city water main to fill tanks at the required rate during all hours of each day, and a filling pump is not provided, the connection to the city water supply shall be made near the point where the city water service enters the building.

******(3) A combined fire standpipe reserve and domestic water tank shall only be filled by direct public water connection or separate fill pumps, or direct connection to equipment, or pumps used to supply domestic water systems in accordance with Reference Standard RS-16.

(d) Emergency Drains on standpipe tanks.-Each standpipe tank shall be provided with a drain of at least 4 in. National Pipe Thread. Each drain pipe shall be controlled by a manually operated gate valve located so as to be readily accessible. The drain shall be installed in accordance with the provisions of Reference Standard RS-16.

(e) Heating of standpipe tanks.-

(1) Where the water in the tank is subject to freezing, the tank shall be equipped with a tank heater in accordance with the provisions of Reference Standard RS 17-10.

(2) Where the standpipe supply and domestic water supply are combined in a single tank, heating of such tank shall not be required in hotels, multiple dwellings, hospitals, or other occupancies where the domestic supply is drawn upon during all hours of every day of the week.

(f) Strainer.-

(1) Every standpipe gravity or suction tank shall be provided with a brass or bronze strainer at the discharge to risers or to pump supply lines.

(2) Each strainer shall have clear openings with an aggregate area equal to, or more than, the required area of the pipe into which the tank discharges. Openings shall be not more than 1 in. nor less than 1/2 in. in diameter.

(g) Overflow pipe for standpipe tanks.-Each gravity standpipe tank shall be provided with an overflow in accordance with the provisions of reference standard RS 16.

(h) Access to standpipe tanks.-Access to the top of each gravity tank shall be by means of a steel, wrought iron or approved equivalent material gooseneck ladder, constructed of flat side bars at least 2 in. by 3/8 in, or equivalent, spaced at least 14 in. apart, with round or square rungs at least 5/8 in. thick spaced not more than 12 in. on centers. The ladder shall be rigidly braced and shall not tip outward from the vertical at any point.

Reference Standard 17

When ladders exceed 25 ft. in height, body irons spaced not more than 2 ft. on center and a metal platform at least 14 in. square, rigidly secured to the stringers of the ladder or other type of enclosed safe access, shall be provided near the top of the tank.

(i) Tank alarms for standpipe systems.-

(1) Gravity tanks not filled by an automatic pump or by city pressure shall be equipped with a high and low water level electrical alarm system.

(2) All pressure tanks used to provide the required primary water supply of a standpipe system shall be equipped with a high and low air pressure and a high and low water level electrical alarm system. Air-to-water ratio shall be 1 to 2 by volume and may be maintained by automatic electrical controls.

****384-82 BCR**

5. Fire Pumps in Standpipe Systems.-

*** (a) Installation of standpipe fire pumps.-

(1) Fire pumps shall be placed on concrete pads at least 12 in. above the pump room floor with a clearance of at least 3 ft. maintained on all sides from walls or from other equipment in the pump room. In the event of the use of a vertical shaft centrifugal fire pump, the 12 in. high concrete pad may be omitted, provided the bottom of the electric driving motor and all electrical appurtenances are raised at least 12 in. above the pump room floor.

(2) The control of the manually operated fire pump shall be designed to operate at predetermined speeds to give pressure increments of 50 psig. The first step of the starter shall provide 100 psig at the pump, and each succeeding step shall produce increments of 50 psig up to the required pump pressure.

(3) Each automatic fire pump shall be equipped with a 3 in. National Pipe Thread pressure relief valve installed in the pump discharge. Such relief valve shall be set to relieve below the shutoff head of the pump, but above the pressure required to maintain the operating pressure at the highest hose valve. The discharge from the relief valve may be piped back into the suction side of the pump on the pump side of the suction valve provided a visual sight glass is installed in the discharge of the relief valve. Automatic fire pumps may be provided with a time delay switch to insure a minimum running time for the pump.

(4) Each manually operated fire pump shall be equipped with a 3 in. National Pipe Thread pressure relief valve for 500 gpm pumps and a 4 in. National Pipe Thread pressure relief valve for 750 gpm pumps. The relief shall be installed in the pump discharge line and set to relieve at a pressure not to exceed 15 lb. over the pressure required to deliver the rate capacity of the pump at the highest hose outlet. Discharge of the relief valve may be piped back into the suction side of the pump on

the pump side of the suction valve provided a visual sight glass is installed in the discharge of the relief valve.

(5) Each manually operated pump shall be equipped with a test valve installed in the pump discharge line that may be connected to the discharge side of the relief valve if the discharge pipe is piped back to the suction side of the pump as provided in (4) above. The size of the test line shall be 3 in. National Pipe Thread for a 500 gpm pump and 4 in. National Pipe Thread for a 750 gpm pump.

(6) The check valves in the pump discharge line shall be either swing type or spring loaded.

** (b) Wiring for fire pumps.-

(1) When the fire pump feeder conductors are routed through the building(s), they shall be enclosed by two (2) inches of concrete or shall be listed electrical circuit protective systems with a minimum of one-hour fire resistance.

*****177-72 BCR; 1014-80 BCR**

****DOB 7-24-96**

***310-90 BCR**

* REFERENCE STANDARD RS 17-2

** ANSI/NFiPA No. 13 – 1989

STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS

The provisions of NFiPA No. 13 – 1989 shall be subject to the following modifications. The section and paragraph numbers are from that standard.

****DOB 6-26-99**

CHAPTER 1-General Information

1-1 Delete.

1-4 Delete.

1-6 Delete.

1-7 Classification of Occupancies

Add 1-7.5 For purposes related to sprinkler installation, classification of occupancies in paragraphs 1-7.2.1, 1-7.3.1, 1-7.3.2, 1-7.3.3 and 1-7.4.1 shall be considered as equivalent to classifications of buildings and spaces in the building code as follows:

Light Hazard-E, G, H-1, H-2, J-1, J-2, J-3

Ordinary Hazard-B-1, B-2, D-1, D-2, C, F-1, F-3, F-4 except restaurant and cafeteria seating areas, shall be considered light hazard. Conference rooms and auditorium spaces related to Class E occupancies shall be considered light hazard.

Extra Hazard-A

1-9 Delete.

1-10 Delete.

1-11.1 Delete.

1-11.2 Delete except for 1-11.2.4 and 1-11.2.5

1-11.3 Delete.

1-12 Delete.

CHAPTER 2-Water Supplies

Reference Standard 17

2-1 Delete.

Revise table 2-2.1 (a) and notes to read as follows:

**TABLE 2-2.1.1(a)
GUIDE TO WATER SUPPLY REQUIREMENTS FOR
PIPE SCHEDULE SPRINKLER SYSTEMS**

Occupancy Classification	Residual Pressure Required (See Note 1)	Acceptable Flow at Base of Riser (See Note 2)	Duration in Minutes (See Notes 3, 4 & 5)
Light Hazard	15 psi	500-750 gpm	30
Ordinary Hazard (Group 1)	15 psi or higher	700-1000 gpm	40
Ordinary Hazard (Group 2)	15 psi or higher	850-1500 gpm	40
Ordinary Hazard (Group 3)	Pressure and flow requirements for sprinklers and hose streams to be determined from Table 2-2.1.1 (b)		40
Warehouses (See Note 6)	Pressure and flow requirements as determined by Chapter 7 and subject to Commissioner's approval.		
High Rise Buildings	Pressure and flow requirements for sprinklers in accordance with Table 2-2.1.1(b).		
Woodworker's Shop - See Appendix A	Pressure and flow requirements subject to Commissioner's approval.		
Extra Hazard	Pressure and flow requirements subject to Commissioner's approval.		

Notes:

1. The pressure required at the base of the sprinkler(s) is defined as the residual pressure required of the elevation at the highest sprinkler plus the pressure required to reach this elevation.
2. The lower figure is the minimum flow ordinarily acceptable for pipe schedule sprinkler systems. The higher flow should normally suffice for all cases under each group.
3. Where there is a requirement for a sprinkler alarm, a central station signal shall be provided.
4. In existing buildings only, the Commissioner may authorize reduction of storage to 20 minutes provided there are provisions for acceptable mechanical automatic means of makeup to the storage tank.
The following conditions should be met for determining acceptable means for makeup:
 - a) Automatic means of makeup for a tank fire reserve should be capable of pumping water into the tank at a rate, for a period of 20 minutes, sufficient to equal the difference between the normal 30-minute demand and the alternate 20-minute demand. The demand required is established by calculations for the "most demanding remote area" from the riser as shown by examples of Appendix A of NFPA 13-1989 and as now determined for the 30-minute demand.
 - b) There should be at least two (2) automatic means of makeup, each having the same capacity, so that in the event a unit must be removed for repairs the other unit can be placed in service.
 - c) An approved low water alarm is to be provided and located at a point 500 gallons above the available fire reserve level.
5. Where the water supply to a system sized in accordance with the pipe sizing schedules is taken from a water storage tank, the adequacy of the tank capacity shall be verified with a hydraulic calculation.
6. This occupancy classification shall apply when the warehouse contains high-piled or rack storage as defined in Section 4-1.3.10 and complies with the requirements of NFPA 231 and 231C.

Reference Standard 17

***Delete Table 2-2.1 (b) in its entirety, except for Density Curves and add the following:**

TABLE 2-2.1.1(b)

TABLE AND DESIGN CURVES FOR DETERMINING DENSITY, AREA OF SPRINKLER OPERATION AND WATER SUPPLY REQUIREMENTS FOR HYDRAULICALLY DESIGNED SPRINKLER SYSTEMS

Minimum Water Supply Requirements

Hazard Classification	Sprinklers Only-gpm	Duration in Minutes (See Notes 1, 2, & 3)
Light	See 2-2.1.3	30
Ord.-Gp. 1	See 2-2.1.3	40
Ord.-Gp. 2	See 2-2.1.3	40
Ord.-Gp. 3	See 2-2.1.3	40

For SI Units: 1 gpm = 3.785 L/min.

Notes:

1. In existing buildings only, the Commissioner may authorize reduction of storage to 20 minutes provided there are provisions for acceptable mechanical automatic means of makeup to the storage tank. Where 20 minutes storage cannot be achieved with existing storage facilities, alternative means of supply may be considered by the Commissioner. In any event, no fire reserve storage facility shall have less than 3500 gallons.

The following conditions should be met for determining acceptable automatic means of makeup:

a) Automatic means of makeup for a tank fire reserve should be capable of pumping water into the tank at a rate, for a period of 20-minutes, sufficient to equal the difference between the normal 30-minute demand and the alternate 20-minute demand. The demand required is established by calculations for the most demanding remote area from the riser as shown by examples of Appendix A of NFPA 13-1989 and as now determined by the 30-minute demand.

b) There should be at least two (2) automatic means of makeup, each having the same capacity, so that in the event that a unit must be removed for repairs the other unit can be placed in service.

c) An approved low water alarm is to be provided and located at a point 500 gallons above the fire level reserve.

2. Where there is a requirement for a sprinkler alarm, a central station signal shall be provided.

3. In no case shall existing sprinkler storage capacities be reduced to less than the amount required for comparable new construction.

4. In fully sprinklered buildings the storage capacity of the fire reserve in the tank shall be as required for the sprinkler demand, but shall not be less than 3500 gallons in buildings with a single fire standpipe riser nor less than 5000 gallons in buildings with multiple fire standpipe risers.

5. Storage in light hazard occupancies where not more than 15 percent of the building is of ordinary hazard may have storage capacity predicated on light hazard occupancy provided that any such space shall not exceed 5,000 square feet in area.

***633-83 BCR**

2-2.4.1 to 2-2.4.6 Delete Except 2-2.4.3

2-3 Connections of Water Works Systems.

2-3.1.2 Delete.

2-4 Gravity Tanks.

2-4.2 Add an additional sentence to read as follows: "If any of the sprinkler heads are supplied from domestic water tanks, the combined water supply in the tank shall be at least 5,000 gallons. Further, that the sprinkler supply shall be taken from the lowest level of the tank."

Add 2-4.3 Combined Use. In E, F, G, H and J Occupancies, with only limited ordinary hazard areas, the sprinkler and standpipe reserve may be common to both. Reserve shall be sized for the greater demand.

Interpretations: Limited, may be defined as less than 30% of the floor area.

Add 2-4.3.1 Buildings whose occupancies are more than 85 percent light hazard, may have a light hazard water supply provided the ordinary hazard areas are designed for ordinary hazard requirements in respect to sprinkler spacing and pipe sizing.

Add 2-4.3.2 Combined standpipe and sprinkler systems may be used in D-2 Laboratory Occupancies, E, F, G, H and J. If an automatic fire pump is used as the primary supply, the requirements of 2-5.3 shall be complied with.

2-5 Pumps

Add 2-5.3 Combined Use. In light hazard occupancies with only limited ordinary hazard areas, an automatic fire pump serving the lower 300 feet of the standpipe system may be used as the primary supply to the sprinkler system, provided that a secondary power supply is available to drive the pump; and such power supply shall be automatic switching.

Add 2-5.4 In hydraulically designed sprinkler systems supplied from a gravity tank, the pressure may be increased by means of an automatic, special service fire pump. The pump shall be sized to satisfy the requirements of Table 2-2.1.1(a) or Table 2-2.1.1(b) and shall be arranged in a bypass to permit the portion of the system so supplied to be served by the system's siamese connections.

(a) If the pump is not supplied from the street side of the building service switch, the electrical service and pump operation shall be fully supervised; provided that a secondary power supply is available to drive the pumps and such power supply shall be automatic switching.

*2-5.5 Wiring for fire pumps. When the fire pump feeder conductors are routed through the building(s), they shall be enclosed by two (2) inches of concrete or shall be listed electrical circuit protective systems with a minimum of one-hour fire resistance.

***DOB 7-24-96**

Reference Standard 17

2-6 Pressure Tanks

Delete 2-6.1 to 2-6.3 and substitute:

2-6.1 Acceptability.

2-6.1.1 A pressure tank in accordance with Table 2-2.1.1(a) or 2-2.1.1(b) is an acceptable water supply source. The total available quantity of water in pressure tanks need not exceed 15,000 gallons when there is a secondary source of water supply available from a gravity tank or a street connection acceptable to the Commissioner of Buildings. The maximum gross capacity of a single pressure tank shall be 9,000 gallons and shall include the needed extra capacity to fill dry-pipe or preaction systems when installed.

2-6.1.2 Each tank shall be kept at a maximum of 2/3 full of water and a minimum of 1/3 full of air maintained under a minimum pressure of 75 psig. The water-to-air ratio shall be so proportioned and the tank so located that a minimum pressure of 15 psig will be available on the highest line of sprinklers below the main roof when all the water is being discharged from the tank.

2-6.1.3 The tank supports shall be designed on the basis of the tank being full of water.

2-6.2 The tanks shall be supplied with water through a fixed pipe, independent of the sprinkler piping and at least 2 inch in size. The water supply shall be capable of supplying the tank at a rate of at least 65 gpm without decreasing the pressure in the tank. The tank shall have a fixed water level plate on the end of the tank opposite the gage glass, or equivalent devices, to indicate the level of the water in the tank.

2-6.3 The air compressor shall be provided with automatic controls for maintaining the air pressure. The capacity of the compressor shall be sufficient to build up the tank pressure to 75 psig within 3 hr. or less.

2-6.4 Pressure tanks shall be provided with approved closed circuit high and low water and high and low air pressure alarms.

2-6.5 Pressure tanks shall be located at or above the top level of sprinklers.

2-7 Delete.

2-8 Delete.

CHAPTER 3-System Components

3-1.1 Delete

3-1.1.1 Delete

3-1.1.4 Delete

3-1.1.5 Delete

Add the following, in lieu of the above:

Piping Specifications.

3-1.1 Pipe or tube used in sprinkler systems shall be welded and seamless steel, wrought steel, wrought iron, drawn seamless copper tube or threadless copper pipe.

The chemical and physical properties of wrought steel or wrought iron pipe should be at least equal to those manufactured in accordance with the specifications of the American Society for Testing and Materials for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel-Pipe for Ordinary uses.

ANSI/ASTM Designation A120-80; Welded and Seamless Steel Pipe ANSI/ASTM Designation A53-79; ASTM Designation A72-68.

Dimensions for wrought steel or wrought iron pipe should be in accordance with the American Standard for Wrought Steel and Wrought Iron Pipe, ANSI B36.10-1979. Pipe used in sprinkler systems should be designed to withstand a working pressure of not less than 175 psig. It is intended that this sprinkler standard permit the use of "standard wall" pipe as described in ANSI B36.10-1979 for pressure up to 300 psig. Schedule 40 pipe is considered "standard wall" pipe. Schedule 30 pipe is acceptable in sizes 8 inches and larger. However, "light wall" schedule 10 pipe is acceptable in sizes 10 inches and smaller, provided that the piping is designed to withstand a working pressure of not less than 175 psig, when approved.

Tube or threadless pipe used in sprinkler systems shall be drawn seamless copper tube or threadless copper pipe conforming to the chemical and physical properties of one of the following standards issued by the American Society for Testing and Materials:

Seamless Copper Tube ANSI/ASTM *B75-79

Seamless Copper Water Tube ANSI/ASTM B88-76

General Requirements for Wrought Seamless Copper and

Copper-Alloy Tube ANSI/ASTM B251 M-79

Threadless Copper Pipe ANSI/ASTM B302-76

Copper Tube or threadless pipe used in sprinkler systems as specified in the above standards shall be limited to wet systems for light and ordinary hazard occupancies using sprinkler heads having 165° F rating or less, and shall have minimum wall thickness capable of withstanding a working pressure of not less than 175 psig at a service temperature of 300° F for both annealed and drawn tempers.

Copper Water Tube Types K and L ANSI/ASTM B88-76, and Threadless Copper Pipe Type TP, ANSI/ASTM B302-76.

Copper Pipe Type TP, ANSI/ASTM B302-76. Ferrous Piping (Welded and Seamless), ANSI/ASTM A 135-79 Specification for Electric-Resistance Welded Steel Pipe, pursuant to Board of Standards & Appeals Calendar No. 75-77-SA are acceptable.

Other approved types of pipe or tube may be used, but only those investigated and listed for this service by a nationally recognized testing and inspection agency and acceptable to the Commissioner. The use of pipe or tube other than that described above must involve consideration of many factors, e.g.,

**As enacted but "B75-81" probably intended.*

1. Pressure rating.

Reference Standard 17

2. Beam strength (hangers).
3. Corrosion (Chemical and electrolytic).
4. Resistance to failure when exposed to elevated temperatures.
5. Methods of joining (strength, permanence, fire hazard).
6. Availability of fittings (for sprinkler outlets and proper routings).
7. Toxicity.

3-1.1.5 Delete, and substitute the following:

3-1.1.5 Other types of pipe or tube may be used, but only those investigated and listed for this service by a nationally recognized testing and inspection agency acceptable to the Commissioner. The use of pipe or tube other than that described above must involve consideration of many factors, e.g.

1. Pressure rating
2. Beam strength (hangers)
3. Corrosion (chemical and electrolytic)
4. Resistance to failure when exposed to elevated temperatures
5. Methods of joining (strength, permanence, fire hazard)
6. Availability of fittings (for sprinkler outlets and proper routings)
7. Physical characteristics related to integrity during earthquakes.
8. Toxicity
9. Combustibility
10. Movement during sprinkler operation (water distribution).

3-2 Definitions. Add the following: Fire Section-See sub-article 201.0. Each floor of a sprinklered building may be considered a fire section.

Add 3-3.4.1 In altering existing sprinkler systems which contain 3/4-inch pipe, the existing 3/4-inch pipe may be retained except that extension from such 3/4-inch pipe shall be made using pipe having a minimum diameter of one-inch.

3-3.7 One and One-Half-Inch Hose Connections. Delete.

3-3.8 Hose Connections For Fire Department Use. Delete. Add the following in lieu of the above:

3-3.7 Fire Standpipe Hose Connections. Where permitted in E, F, G, H and J occupancies by Section 2-4.3, and where permitted by the Commissioner, the sprinkler systems may be connected to the distribution system of mains and risers serving the required standpipe hose connections. Connections to the common sprinkler and standpipe systems shall be valved and fitted with an approved supervised tamper switch and flow detector.

3-3.1 Delete the first sentence and add the following:

"The maximum floor area to be protected by a single riser, from a control and alarm device, on any one floor shall be as follows:"

3-4 Pipe Schedules

3-4.1.1 Delete-Add the following:

3-4.1.1 A test pipe of not less than 1-inch diameter terminating in a smooth bore corrosion resistant outlet giving a flow equivalent to one sprinkler shall be provided. This test pipe shall be provided for each

system through a pipe not less than 1-inch in diameter, in the upper story, and the connection should preferably be piped from the end of the most remote branch line. The discharge should be at a point where it can be readily observed. In locations where it is not practical to terminate the test pipe outside the building, the test pipe may terminate in a drain. In this event, the test connection shall be made using an approved sight test connection containing a smooth bore corrosion resistant orifice giving a flow equivalent to one sprinkler. The test valve shall be located at an accessible point, and preferably not over seven feet above the floor. The control valve on the test connection shall be located at a point not exposed to freezing.

Add 3-4.4.1 In buildings having mezzanine floors, large platforms, or large openings between floors which cannot be closed or satisfactorily cut off, the possibility that all or most of the sprinklers might be opened by a single fire should be considered in determining the size of risers. Where occupancy and construction are exceptionally good and where there is little likelihood of a fire spreading beyond the vicinity of its origin, the size of the feed main should be based on the total number of sprinklers in the main area plus half the number in the area not cut off. A sprinkler water, curtain may be considered an exceptionable cut off for openings of less than 1000 square feet.

Add 3-4.6 Sizes for Domestic Water Piping. Where permitted by the building code, 10 or less heads, that are connected to the domestic water system shall have the piping sized in accordance with the tables herein and the domestic water line to which the sprinkler line connected thereto. Connections may be made directly to cross-connections or headers.

3-6.2.3 Delete first sentence and change to read: Each interior sectional or floor control valve shall be provided with a drain connection sized as shown in Table 3-6.2.3 so as to drain that portion of the system controlled by the sectional or floor valve.

Table 3-6.2.3

Sectional or Floor Valve Size	Minimum Size of Drain Connection
Up to 2 1/2 in.	1-in.
3-in., 3 1/2-in., 4-in.	1 1/4 in.
5-in. and 6-in.	1 1/2-in.
8-in.	2-in.

Delete Section 3-7.4 and substitute the following:

3-7.4 Joints for the connection of copper tube or threadless pipe shall be brazed. Brazing filler metal classed BCuP-3, BCuP-5, BAG-2 (ANSI/AWS A5.8-89) may be used.

Add Lead free solder joints may be permitted for wet pipe systems in Light Hazard Occupancies when the temperature classification of the installed sprinklers is Ordinary or Intermediate.

Reference Standard 17

3-8 Fittings

Re-number Section 3-8.1.4 to 3-8.1.6

Re-number Section 3-8.1.5 to 3-8.1.7

Add a new Section 3-8.1.4 to read as follows:

3-8.1.4 Fittings used in the assembly of copper tube shall conform to the following standards issued by the American National Standards Institute:

Bronze Flanges and Flanged Fittings
150 to 300 lb. ANSI B16.24-79

Add a new section 3-8.1.5 to read as follows:

3-8.1.5 Fittings used in the assembly of threadless copper pipe (Type TP) shall conform to the following standards:

Cast Bronze, Brazed-Joint Pressure Fittings

Dimensions MIL F-1183 J-87

Chemical and physical properties ANSI/ASTM B61-86 or
ANSI/ASTM B62-86

Bronze Flanges and Flanged Fittings

150 and 300 lb. ANSI B16.24-79

3-8.6 One and One-Half-Inch Hose Connections. Delete.

3-8.7 Hose Connections for Fire Department Use. Delete.

Add the following in lieu of the above.

3-8.7 Fire Standpipe Hose Connections. Where permitted in E, F, G, H and J Occupancies by Section 2-4.3 and where permitted by the Commissioner, the sprinkler system may be connected to the distribution system of mains and risers serving the required standpipe hose connections. Connections to the common sprinkler and standpipe systems shall be valved and fitted with an approved supervised tamper switch and flow detector.

3-9 Valves

3-9.1.1 Delete-Add the following:

3-9.1.1 A test pipe of not less than 1-inch diameter terminating in a smooth bore corrosion resistant outlet giving a flow equivalent to one sprinkler shall be provided. This test pipe shall be provided for each system through a pipe not less than 1 inch in diameter in the upper story, and the connection should preferably be piped from the end of the most remote branch line. The discharge should be at a point where it can be readily observed. In locations where it is not practical to terminate the test pipe outside the building, the test pipe may terminate into a drain. In this event, the test connection shall be made using an approved sight test connection containing a smooth bore corrosion resistant orifice giving a flow equivalent to one sprinkler. The test valve shall be located at an accessible point and preferably not over seven feet above the floor. The control valve on the test connection shall be located at a point not exposed to freezing.

3-9.1.1 Add the following sentence:

An approved indicating shutoff valve may be used in lieu of an O.S.&Y. gate valve wherever referred to in these modifications except such valve shall not be part of the pressure reducing valve. The indicator shall be readily visible from the floor.

3-9.2 Valves Controlling Sprinkler Systems.

3-9.2.3 Delete exception #2.

3-9.2.5 Delete.

3-9.2.6 Delete.

3-9.2.7 Delete.

Add 3-9.2.5 Where there is one water supply connection a check valve shall be installed. Such check valve may be a swing check, an approved fire meter or an approved detector check.

Add 3-9.2.6 Where a system having only one dry-pipe valve is supplied with city water and Fire Department connection, it will be satisfactory to install the main check valve in water supply connection in a vertical position immediately inside of the building after the main indicating valve.

Add 3-9.2.7 Where either a wet or dry pipe sprinkler system is supplied by city water and a Fire Department connection and has more than one riser with O.S.&Y. gate valve in each, and the whole system is controlled by one outside post indicator valve, it will be satisfactory to install the main check valve in the water supply connection immediately inside building. If the supply is controlled by an underground gate valve with a Department of Environmental Protection standard roadway box, the main check valve in the water supply connection should be installed immediately after the O.S.&Y. gate valve inside the building.

Add 3-9.2.8 Where a wet pipe sprinkler system is supplied by city water and a Fire Department connection with only one riser, the alarm valve will be considered as a check valve and an additional check will not be required.

Add 3-9.2.9 A gate valve should be installed on each side of each check valve under conditions other than described in Paragraphs 3-9.2.6, 3-9.2.7 and 3-9.2.8. However, this shall not apply to Fire Department Siamese check valves.

Add 3-9.2.10 Where a gravity tank is located on a tower in the yard, the gate valve on the tank side of the check valve shall be of O.S.&Y. type; the other shall be either an O.S.&Y. valve or an indicator post valve. Where a gravity tank is located on a building, both gate valves shall be the O.S.&Y. type; and all fittings inside the buildings, except the drain tee fill line, and heater connections, shall be under the control of a gate valve.

Add 3-9.2.11 In a city connection serving as one source of supply the city valve in the connection may serve as one of the required gate valves. An O.S.&Y. valve or an indicator post valve should be installed on the systems (water supply) side of the check valve.

Add 3-9.2.12 A connection from public water system shall not extend into or through a building unless such connection is under the control of an outside indicator post or O.S.&Y. gate or under the control of an inside O.S.&Y. gate valve located near the outside wall of the building.

Add 3-9.2.13 When a pump, located in a combustible pump house or exposed to danger from fire or falling walls, or a tank discharges into a yard main valve, fed by another supply, either the check valve in the connection shall be located in a pit or the gate valve should be of the indicator post type, located a safe

Reference Standard 17

distance outside of buildings.

Add 3-9.2.14 Check valves on tank or pump connections, when located underground, may be placed inside of buildings and at a safe distance from the tank riser or pump, except in cases where the building is entirely of one fire area, when it is ordinarily considered satisfactory to locate the check valve over-head in the lowest level.

Add 3-9.2.15 All gate valves controlling water supplied for sprinklers shall be located where readily accessible and when necessary, permanent ladders, clamped treads on risers, chains and wheels, or other accepted means should be provided.

Add 3-9.2.16 Section Valves in Underground Fire Mains. Large yard systems shall have section controlling valves at appropriate points, in order to permit sectionalizing the system in the event of a break, or for the making of repairs or extension (See Standard for Outside Protection, ANSI/NFPA No. 24-87).

Add 3-9.2.17 Floor Valves. Floor control valves shall be provided where required or in special cases where area or height, or number of tenants is excessive, both in manufacturing and mercantile buildings, or where contents are more than ordinarily susceptible to damage. Floor valves shall be located where they are readily accessible. They are to be O.S.&Y. or indicating type located ahead of the inlet of any pressure reducing valve.

Add 3-9.2.18 Indicator Posts for Gate Valves.

Add 3-9.2.18.1 Outside Control shall be provided.

Add 3-9.2.18.2 Where sprinklers are supplied from a yard main, an approved outside indicator post gate valve shall be placed in the connecting pipe at a safe distance from the building.

Add 3-9.2.18.3 Indicator post valves should be located not less than 40 feet from buildings; but where necessary to place a valve close to a building, it should be located at a blank part of the wall.

Add 3-9.2.18.4 When a building has no basement, and an outside post indicator control cannot be furnished, a short post indicator may be installed in a horizontal position in riser with handwheel projecting outside of wall.

Add 3-9.2.19 Pits for Underground Valves. Pits for underground valves except those located at the base of a tank riser, are described in the Standard for Outside Protection (ANSI/NFPA No. 24-87). For pits protecting valves located at the base of a tank riser, refer to RS-10.

Add 3-9.2.20 Securing of Valves. All gate valves in supply pipes to automatic sprinklers, whether or not of indicator or post pattern, shall be sealed open in a satisfactory manner.

Add 3-9.2.21 Valves controlling sprinkler supplied from the standpipe system shall be approved for standpipe service in the pressure zone in which it is installed. They shall be O.S.&Y. or indicating valves and shall be located ahead of the inlet of any pressure reducing valve installed.

3-9.3.4. Delete.

3-11.5.2 Add to first sentence; and subject to the Commissioner's approval.

3-12.3.2 Delete this Section, and substitute the following:

Dry Pipe Valves. The alarm apparatus for a dry-pipe system shall consist of approved low and high air pressure alarm attachments to the dry-pipe valve. When a dry-pipe valve is located on the system side of an alarm valve, the actuating device of the alarms for the dry-pipe valve may be connected to the alarms on the wet-pipe system.

Delete Section 3-12.4 and the following, in lieu of the above:

3-12.4 Joints for the connection of copper tube or threadless pipe shall be brazed. Brazing filler metal classes BCuP-3, BCuP-5, BAg-2 *(ANSI/AWS A5.8-77) may be used.

**As enacted but "(ANSI/AWS A5.8-76)" probably intended.*

3-12.6 Delete this section and add; refer to RS 17-3

3-12.7 Delete this section and add; refer to RS 17-3

3-12.8 Delete this section, and substitute the following:

Identification Signs. Identification signs shall be provided for outside alarm devices. The sign should be located near the device in a conspicuous position and shall be worded as follows: "**SPRINKLER FIRE ALARM-WHEN BELL RINGS CALL FIRE DEPARTMENT OR POLICE**".

Add 3-12.9 Drains

Add 3-12.9.1 Where vents are necessary for satisfactory electric alarm switch operations, such vents should be properly piped to a drain.

Add 3-12.9.2 Drains from alarm devices shall be so arranged that there will be no danger of freezing, and so that there will be no overflowing at the alarm apparatus, at domestic connections or elsewhere with the sprinkler drains wide open and under pressure.

Add 3-12.9.3 Drain from retarding chamber and electric alarm switch should preferably discharge through an open cone and be run separate from main system drains to a safe and visible point of free discharge or to sewer or ground drain. Drain from water-motor-operated alarm device may run separately to sewer or ground drain or may be connected to drain from retarding chamber at a point between such sewer and a check valve on this drain, a union or plug being inserted in the drain from the alarm device to permit inspection. Where checks are used they shall be so located as to have the equivalent of at least a four-foot head and shall not be installed in a vertical position.

Add 3-12.9.4 Where drains are conveyed to a sewer, a proper trap shall be provided.

Add 3-12.9.5 Where it is necessary to drain alarm valves outside the wall, an open discharge cone shall be provided inside to break the pipe line so that cold air will not conduct directly into the retarding chamber. Alternately, all drains shall have at least 4 feet of pipe beyond the valves, in a warm area.

3-13 Fittings

Renumber Section 3-13.1.4 to 3-13.1.6

Renumber Section 3-13.1.5 to 3-13.1.7

Add a new Section 3-13.1.4 to read as follows:

3-13.1.4 Fittings used in the assembly of copper tube shall conform to the following standards issued by the American National Standards Institute:

Reference Standard 17

Bronze Flanges and Flanged Fittings

150 to 300 lb. ANSI B16.24-79

Add a new section 3-13.1.5 to read as follows:

3-13.1.5 Fittings used in the assembly of threadless copper pipe (Type TP) shall conform to the following standards:

Cast Bronze, Brazed-Joint Pressure Fittings

Dimensions MIL F-1183 G-78

Chemical and physical properties ANSI/ASTM B61-80 or

ANSI/ASTM B62-80

Bronze Flanges and Flanged Fittings

150 to 300 lb. ANSI B16.24-79

3-14 Valves.

123-14.1.1 Add the following sentence:

"An approved indicating valve may be used in lieu of an O.S.&Y. gate valve wherever referred to in these modifications except where such valve is to be installed in conjunction with a pressure reducing valve."

3-14.2 Valves Controlling Sprinkler Systems.

Amend 3-14.2.1 Each system shall be provided with a listed indicating valve so located as to control all sources of water supply except fire department connections.

3-14.2.5 Delete.

3-14.2.6 Delete.

3-14.2.7 Delete.

Add 3-14.2.5 Where there is one water supply connection, a check valve shall be installed. Such check valve may be a swing check, an approved fire meter or an approved detector check.

Add 3-14.2.6 Where a system having only one dry-pipe valve is supplied with city water and Fire Department connection, it will be satisfactory to install the main check valve in water supply connection in a vertical position immediately inside of the building after the main indicating valve.

Add 3-14.2.7 Where either a wet or dry pipe sprinkler system is supplied by city water and Fire Department connection and has more than one riser with O.S.&Y. gate valve in each and the whole system is controlled by one outside post indicator valve, it will be satisfactory to install the main check valve in the water supply connection immediately inside building. If the supply is controlled by an underground gate valve with an approved roadway box, the main check valve in the water supply connection should be installed immediately after the O.S.&Y. gate valve inside the building.

Add 3-14.2.8 Where a wet pipe sprinkler system is supplied by city water and a Fire Department connection with only one riser, the alarm valve will be considered as a check valve and an additional check will not be required.

Add 3-14.2.9 A gate valve should be installed on each side of each check valve under conditions other than described in Paragraphs 3-14.2.6, 3-14.2.7, 3-14.2.8. However, this shall not apply to Fire Department Siamese check valves.

Add 3-14.2.10 Where a gravity tank is located on a

tower in the yard, the gate valve on the tank side of the check valve shall be of O.S.&Y. type, the other shall be either an O.S.&Y. valve or an indicator post valve.

Where a gravity tank is located on a building both gate valves shall be the O.S.&Y. type; and all fittings inside the buildings, except the drain ice fill line, and heater connections, shall be under the control of a gate valve.

Add 3-14.2.11 In a city connection serving as one source of supply the city valve in the connection may serve as one of the required gate valves. An O.S.&Y. valve or an indicator post valve should be installed on the systems (water supply) side of the check valve.

Add 3-14.2.12 A connection from public water system shall not extend into or through a building unless such connection is under the control of an outside indicator post or O.S.&Y. gate valve or under the control of an inside O.S.&Y. gate valve located near the outside wall of the building.

Add 3-14.2.13 When a pump, located in a combustible pump house or exposed to danger from fire or falling walls, or a tank discharges into a yard main fed by another supply, either the check valve in the connection shall be located in a pit or the gate should be of the indicator post type, located a safe distance outside of buildings.

Add 3-14.2.14 Check valves on tank or pump connections, when located underground, may be placed inside of buildings and at a safe distance from the tank riser or pump, except in cases where the building is entirely of one fire area, when it is ordinarily considered satisfactory to locate the check valve over-head in the lowest level.

Add 3-14.2.15 All gate valves controlling water supplied for sprinklers shall be located where readily accessible and when necessary, permanent ladders, clamped treads on risers, chains and wheels, or other accepted means should be provided.

Add 3-14.2.16 Section Valves in Underground Fire Mains. Large yard systems shall have section controlling valves at appropriate points in order to permit sectionalizing the system in the event of a break, or for the making of repairs or extension. (See Standard for Outside Protection, ANSI/NFPA No. 24)

Add 3-14.2.17 Floor Valves. Floor control valves shall be provided where required or in special cases where area or height, or number of tenants is excessive, both in manufacturing and mercantile buildings, or where contents are more than ordinarily susceptible to damage. Floor valves shall be located where they are readily accessible. They are to be O.S.&Y. type located ahead of the inlet of any pressure reducing valve.

Add 3-14.2.18 Indicator Posts for Gate Valves.

Add 3-14.2.18.1 Outside control shall be provided.

Add 3-14.2.18.2 Where sprinklers are supplied from a yard main, an approved outside indicator post gate valve shall be placed in the connecting pipe at a safe distance from the building.

Add 3-14.2.18.3 Indicator post valves should be located not less than 40 feet from buildings; but where necessary to place a valve close to a building, it should

Reference Standard 17

be located at a blank part of the wall.

Add 3-14.2.18.4 When a building has no basement and an outside post indicator control cannot be furnished, a short post indicator may be installed in a horizontal position in riser with handwheel projecting outside of wall.

Add 3-14.2.19 Pits for Underground Valves. Pits for underground valves except those located at the base of a tank riser are described in the Standard for Outside Protection (ANSI/NFPA No. 24). For pits protecting valves located at the base of a tank riser, refer to the Standard for Water Tanks for Private Fire Protection (ANSI/NFPA No. 22).

Add 3-14.2.20 Securing of Valves. All gate valves in supply pipes to automatic sprinklers, including indicator or post pattern, shall be sealed open in a satisfactory manner.

Add 3-14.2.21 Valves controlling sprinkler supplied from the standpipe system shall be approved for standpipe service in the pressure zone in which it is installed. They shall be O.S.&Y. valves and shall be located ahead of the inlet of any pressure reducing valve installed.

3-15 Hangers

3-15.1.10 Delete this section and substitute the following:

3-15.1.10 Maximum Distance Between Hangers. With Steel Pipe as specified in this chapter, the maximum distance between hangers shall not exceed 12 feet for 1 and 1 1/4 inch sizes nor 15 feet for sizes 1 1/2 inch and larger except as provided in 3-15.6. See Figure A-3-15.1.10.

With copper tube or pipe as specified in this chapter, maximum spacing between hangers shall not exceed the distance indicated on Figure A-3-15.5.4 with steel band and ring hangers confirming therewith.

HANGER SPACE FOR COPPER PIPE AND COPPER TUBE-HORIZONTAL RUN HORIZONTAL RUN HANGER SPACING

Tube Size	Spacing
3/4" to 1"	5-8 feet
1 1/4" and 1 1/2"	8-10 feet
2" and 3"	10-12 feet
4"-8"	12-15 feet

SIZING OF SPS** STEEL STRAP AND RING HANGERS FOR USE WITH COPPER TUBE SPS Steel Strap or Ring Hanger

Copper Tube Size inches	Nominal Outside Diameter, inches	Size, inches	Minimum Inside Diameter, inches
1/4	0.875	1/2 or 3/4	1.050 or 1.315
1	1.125	1/4 or 1	1.315
1 1/4	1.375	1	1.660
1 1/2	1.625	1 1/4	0.840
2	2.125	2	2.375

*Above 2-inch, use the same SPS hanger size as the tube size.

**Standard Pipe Size Figure A-3-15.5.4.

3-17.3.2 Delete this Section, and substitute the following: Dry Pipe Valves. The alarm apparatus for a dry-pipe system shall consist of approved flow and low and high air alarm

attachments to the dry-pipe valve. When a dry-pipe valve is located on the system side of an alarm valve, the actuating device of the alarms for the dry-pipe valve may be connected to the alarms on the wet-pipe system.

3-17.7 Delete this Section, and substitute the following: Identification Signs. It is essential to provide identification signs for outside alarm devices. The sign should be located near the device in a conspicuous position and shall be worded as follows: **"SPRINKLER FIRE ALARM-WHEN BELL RINGS CALL FIRE DEPARTMENT OR POLICE."**

Add 3-17.8 Drains.

Add 3-17.8.1 Where vents are necessary for satisfactory electric alarm switch operation, such vents should be properly piped to a drain.

Add 3-17.8.2 Drains from alarm devices shall be so arranged that there will be no danger of freezing and so that there will be no overflowing at the alarm apparatus, at domestic connections or elsewhere with the sprinkler drains wide open and under pressure.

Add 3-17.8.3 Drain from retarding chamber and electric alarm switch should preferably discharge through an open cone and be run separate from main system drains to a safe and visible point of free discharge or to sewer or ground drain. Drain from water-motor-operated alarm device may run separately to sewer or ground drain or may be connected to drain from retarding chamber at a point between such sewer and a check valve on this drain, a union or plug being inserted in the drain from the alarm device to permit inspection. Where checks are used they shall be so located as to have the equivalent of at least a four-foot head and shall not be installed in a vertical position.

Add 3-17.8.4 Where drains are conveyed to a sewer, a proper trap shall be provided.

Add 3-17.8.5 Where necessary to drain alarm valves outside the wall, an open discharge cone shall be provided inside to break the pipe line so that cold will not be conducted directly into the retarding chamber. Alternately, all drains shall have at least four foot of pipe beyond the valves in a warm area.

CHAPTER 4-Spacing, Location and Position of Sprinklers

4-1.2 Delete.

4-2.2.1 Delete the first sentence and add the following: "The maximum floor area to be protected by a single riser, from a control and alarm device, on any one floor shall be as follows:"

4-4.7.1 Delete

4-4.7.2.1 Delete

4-4.7.2.2 Delete

4-4.7.2.3 Add to last sentence:

when required by other sections of this code

Delete the Exception

4-4.7.2.4 Delete

4-4.8 Add the following:

Sprinklers shall be provided in chute vestibules on all floors, if no vestibule exists, then sprinklers shall be provided above chute doors and shall be located no

Reference Standard 17

more than 1-foot horizontally from face of chute door. All building service chute sprinkler systems shall be provided with a local water flow and valve supervisory alarm and be connected to an authorized fire alarm central office.

4-4.8.1 Delete.

4-4.8.2 Delete.

4-4.8.2.4 Delete.

Add 4-4.17.4 Safe deposits or other vaults of fire-resistive construction will not require sprinkler protection when used for the storage of records, files and other documents when stored in metal cabinets.

4-4.8.1 Delete and substitute the following:

In cooking areas protected by automatic sprinklers, sprinklers shall be provided to protect commercial-type cooking equipment and ventilation systems that are designed to carry away grease laden vapors unless otherwise protected (see RS 13-2 and RS 13-3). Sprinklers shall be so located as to give complete coverage of cooking surfaces, within exhaust ducts, within exhaust hood plenum chamber, and under filters, if any.

Add 4-4.16.4 Safe deposits or other vaults of less than 1,000 cubic feet in size of fire-resistive construction may not require sprinkler protection when used for the storage of records, files and other documents, when stored in metal cabinets. These vaults shall be equipped with either a smoke or heat detection system connected to an authorized fire alarm central office.

4-4.17.1 Delete, and substitute the following:

In cooking areas protected by automatic sprinklers, sprinklers shall be provided to protect commercial-type cooking equipment and ventilation systems that are designed to carry away grease laden vapors unless otherwise protected (see RS 13-2 and RS 13-3). Sprinklers shall be so located as to give complete coverage of

cooking surfaces, within exhaust ducts, within exhaust hood plenum chamber, and under filters, if any.

4-4.19.2 Add the following:

and provided that hard wired smoke detectors are provided in the sleeping rooms.

*Add section 4-4.19.4 to follow section 4-4.19.3 as follows:

*4-4.19.4 In buildings and spaces classified in Occupancy Groups J-2 and J-3, sprinklers may be omitted from bathrooms, water closet compartments, general toilet rooms and shower rooms.

Add section 4-4.19.5 to follow section 4-4.19.4 as follows:

*4-4.19.5 In buildings and spaces classified in Occupancy Groups J-2 and J-3, sprinklers may be omitted from clothes closets, linen closets and pantries.

*DOB 6-25-99

CHAPTER 5-Types of Systems

5-3.4 Delete and substitute the following:

Location and Spacing of Fire Detection Devices. Spacing of fire detection devices shall be in accordance with their listing by nationally recognized testing laboratories or in accordance with manufacturer's specifications, subject to the approval of the Commissioner of Buildings.

5-3.5 Delete and substitute the following:

Location and Spacing of Fire Detection Devices. Spacing of fire detection devices shall be in accordance with their listing by a nationally recognized testing laboratory or in accordance with the manufacturer's specifications, subject to the approval of the Commissioner of Buildings.

Fig. 5-5.4 Delete and substitute the following:

Fig. 5-5.4 See detail of Typical Installation.

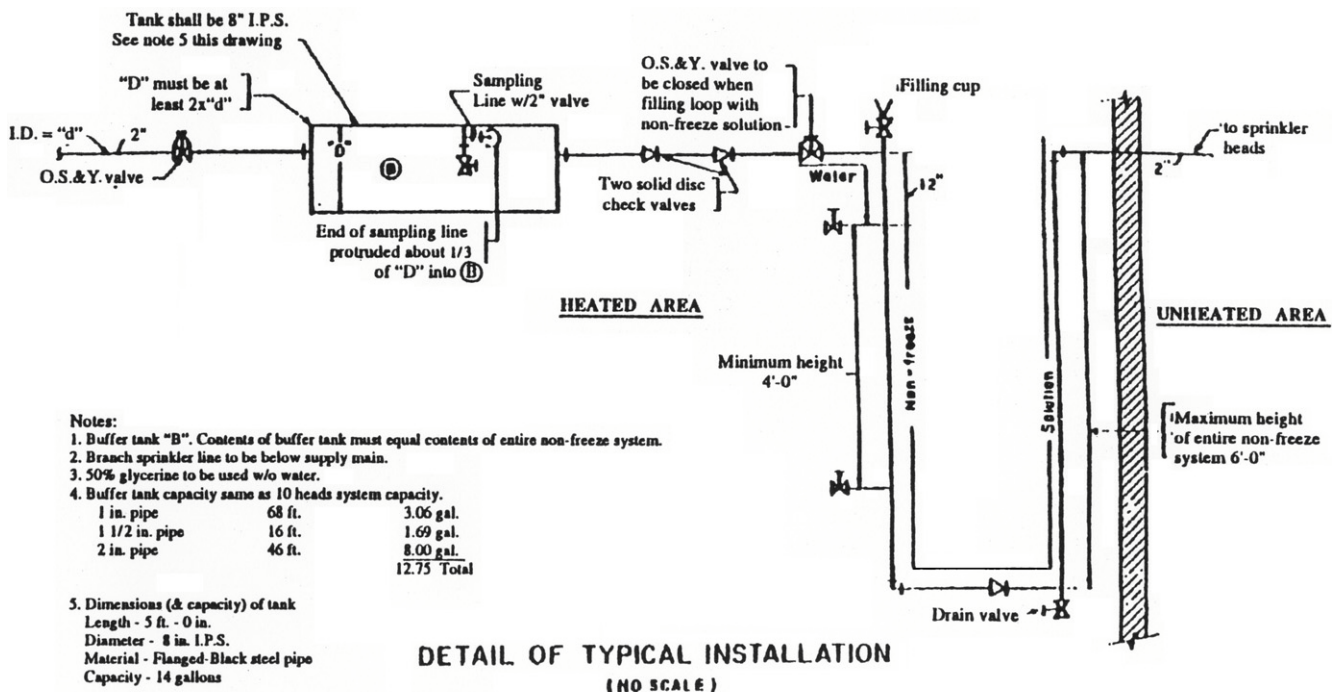


Figure 5-5.4 Arrangement of Supply Piping and Valves

Reference Standard 17

CHAPTER 6-Outside Sprinklers for Protection Against Exposure Fires

- 6-1 Water Supply and Control. Delete
- 6-2 System Components. Delete

CHAPTER 7-Hydraulically Designed Sprinkler Systems

7-1.1.2 Delete and substitute the following:

7-1.1.2 The design basis for such a system supersedes the rules in the sprinkler standard governing pipe schedules except that all systems continue to be limited by area, and pipe shall be not less than 1 inch nominal for ferrous piping and 3/4 inch nominal for copper tube and threadless copper pipe. The size of the pipe, number of sprinklers per branch line and number of branch lines per cross main are otherwise limited only by the available water supply.

However, sprinkler spacing and all other rules covered in this and other applicable standards shall be observed.

7-2.1 Delete and substitute the following:

Design criteria and calculations shall be submitted to the Commissioner along with the plans to obtain the necessary approval.

Table 7-4.3.1.4 Delete under column Pipe or Tube, "Plastic (listed)-All "and under C Value, Delete" 150"

CHAPTER 8-Pipe Schedule Systems

8-1 Delete and substitute the following:

The provisions of this Chapter shall apply to buildings of Class 1 construction, predominantly light hazard occupancy, and more than 100 feet high.

Add 8-1.2.1 Combined Systems Risers-Risers providing the water supply for both standpipe and sprinkler systems shall have a minimum diameter of 6-inches, however, a minimum diameter of 4-inches may be authorized in existing buildings if hydraulic calculations indicate that an adequate supply of water can be assured.

Add 8-1.2.2 When a combined riser is fed by a special service fire pump, a minimum diameter of 4-inches is required to feed fire hose stations. Riser size beyond last hose station is to be determined by hydraulic calculations.

Add 8-1.3.1 In buildings having mezzanine floors, large platforms, or large openings between floors which cannot be closed or satisfactorily cut off, the possibility that all or most of the sprinklers might be opened by a single fire should be considered in determining the size of risers. Where occupancy and construction are exceptionally good, and where there is a little likelihood of a fire spreading beyond the vicinity of its origin, the size of the feed main may be based on the total number of sprinklers in the main area plus half the number in the secondary area. A sprinkler water curtain may be considered an acceptable cut off for openings of less than 1000 square feet.

Add 8-1.4 Sizes for Domestic Water Piping. Where

permitted by the building code, 10 or less heads, that are connected to the domestic water system shall have the piping sized in accordance with the tables herein, and the domestic water line to which the sprinkler piping is connected shall be at least the size of the sprinkler line connected thereto. Connections may be made directly to cross-connections or headers.

8-3.2 Delete.

8-4.2 Add the following to the first sentence: "or as modified by Table 2-2.1B."

8-4.3 Delete.

8-4.4 Add the following:

8-4.4 Combined Systems. Risers providing the water supply for both standpipe and sprinkler systems shall have a minimum diameter of 6 inches: provided, however, a minimum diameter of 4 inches may be authorized in existing buildings if hydraulic calculations indicate that an adequate supply of water can be assured.

Chapter 10-Delete

Appendix A, B and C and D shall be considered part of this Reference Standard, subject to the following modifications:

A-1-7.2.1 Delete.

A-1-7.3.1 Delete.

A-1-7.3.2 Delete.

A-1-7.3.3 Delete.

A-1-7.4 Delete and substitute the following:

A-1-7.4 New installations protecting extra hazard occupancies may be hydraulically designed or pipe schedule systems may be utilized, provided that a sufficient volume of water is supplied, and the water pressure is adequate. When the pipe schedule is used hydraulic calculations shall be done to prove that adequate water volume and water pressure are available.

A-1-7.4.1 Delete.

A-1-8.1.2 Delete and substitute the following:

A-1-8.1.2 Used equipment shall not be permitted unless completely overhauled by the manufacturers; and shall be subject to the approval of the Commissioner.

A-1-9 Delete.

A-2-2.3.3 Delete.

A-2-6.3 Amend sub-section titled "Location of Pressure Tanks" to read as follows:

Pressure tanks shall be located at or above the top level of sprinklers.

A-2-7.1 Delete.

A-2-7.2 Delete.

A-2-7.3 Delete.

A-3-1.1.5 Delete.

A-3-3.2 Delete.

A-3-3.7 Delete.

A-3-7.4 Delete and substitute the following:

A-3-7.4 The fire hazard of the brazing and welding process should be suitably safeguarded. Fire guards having Certificates of Fitness from the Fire

Reference Standard 17

Department shall be provided as required, and portable fire fighting equipment shall be provided.

Add new sentence:

Self-cleaning fluxes shall not be used. Continued corrosive action after the soldering process is completed could result in leaks from the seats of sprinklers.

A-3-10.2 In second paragraph, delete the words "copper tube" and substitute "brass piping or equivalent."

A-3-12.4 Delete and substitute following:

A-3-12.4 The fire hazard of the brazing and welding process should be suitably safeguarded. Fire guards having Certificates of Fitness from the Fire Department shall be provided as required and portable fire fighting equipment shall be provided.

A-4-4.4.4 Add to end of first sentence:

Subject to the approval of the Commissioner.

A-5-3.3 Delete paragraph(b) and add:

(b) The dry-pipe valve should be adequately pressurized to conform to manufacturer's design and available water pressure.

B-4-2.4.6 Delete.

B-7 Delete.

Appendix C Referenced Publications Delete

* 310-90 BCR; 633-83 BCR

*REFERENCE STANDARD RS 17-2A STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS IN RESIDENTIAL OCCUPANCIES UP TO AND INCLUDING SIX STORIES IN HEIGHT

ANSI/NFPA No. 13R-1994 - Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height.

Modifications - The provisions of NFPA No. 13R-1994 shall be subject to the following modifications. The section and paragraph numbers are from that standard.

Preface

Change NFPA 72, *National Fire Alarm Code* to Section 27-979 of the Administrative Code.

Chapter 1 - General Information

Section 1-1 – Change four stories to six stories.

Section 1-3 – The definition of Multipurpose Piping shall be deleted.

Section 1-3 – The definition of Residential Occupancies shall be deleted. The definition of such use as stated in Title 27, Chapter 1, subchapter 3 of the Building Code shall be used.

Section 1-5.2 – Delete and substitute the following:
Section 1-5.2 - Other types of pipe or tube may be used, but only those investigated and listed for this service by a nationally recognized testing and inspection agency in accordance with Underwriters Laboratory Standard 1821

and 1887. The use of pipe or tube other than that described above must involve consideration of many factors, e.g.

(a) Pressure rating

(b) Beam strength (hangers)

(c) Corrosion (chemical and electrolytic)

(d) Resistance to failure when exposed to elevated temperatures

(e) Methods of joining (strength, permanence, fire hazard)

(f) Availability of fittings (for sprinkler outlets and proper routings.)

(g) Physical characteristics related to integrity during earthquakes

(h) Toxicity

(i) Combustibility

(j) Movement during sprinkler operation (water distribution).

Nonmetallic pipe and tube shall comply with the portions of the ASTM standards specified in Table 1-5.2 that apply to fire protection service in addition to the provisions of this paragraph. Nonmetallic pipe shall only be used in wet pipe systems. Nonmetallic pipe shall be installed in accordance with the manufacturer's installation instructions, and in accordance with rules promulgated by the Commissioner of Buildings.

Table 1-5.2 Delete Special Listed Polybutylene (PB) Pipe.

Section 1-5.6 - Delete and substitute the following:

Section 1-5.6 - Joints for the connection of copper tube or threadless pipe shall be brazed. Brazing filler metal classed BCuP-5, BAG-2 (ANSI/AWS A5.8-89) or other approved methods may be used. Lead free solder joints may be permitted for wet pipe systems when the temperature classification of the installed sprinklers is Ordinary or Intermediate.

Section 1-5.7 - Delete and substitute the following:

Section 1-5.7 - Other types of fittings may be used, but only those investigated and listed for this service by a nationally recognized testing and inspection agency in accordance with Underwriters Laboratory Standard 1821 and 1887. The use of fittings other than that described above must involve consideration of many factors as described in Section 1-5.2. Nonmetallic pipe and tube fittings shall comply with the portions of the ASTM standards specified in Table 1-5.7 that apply to fire protection service in addition to the provisions of this paragraph. Nonmetallic pipe and tube fittings shall only be used in wet pipe systems. Nonmetallic pipe and tube fittings shall be installed in accordance with the manufacturer's installation instructions, and in accordance with rules promulgated by the Commissioner of Buildings.

Section 1-6.2.1 - Change NFPA 13 to RS 17-2, and add the following: "The use of antifreeze solutions other than glycerine-water in sprinkler systems using plastic pipe shall not be permitted."

Chapter 2 - Working Plans, Design, Installation, Accepted Tests and Maintenance

Reference Standard 17

Section 2-1 - Delete

Section 2-1.1 - Delete

Section 2-1.1.1 - Delete

Section 2-1.1.2 - Delete

Section 2-1.2 - Delete

Section 2-1.2.1 - Delete

Figure 2-1.2.1 - Delete

Section 2-1.2.2 - Delete

Section 2-1.3 - Delete

Section 2-1.3.1 - Delete

Section 2-1.3.1.1 - Delete

Section 2-1.3.1.2 - Delete

Section 2-1.3.1.3 - Delete

Section 2-1.3.2 - Delete

Section 2-3.2 - Add subparagraph (e) as follows:

(e) A common supply main to the building, serving both sprinklers and domestic uses, may be used if provision is made to prevent flow on the domestic water system upon operation of sprinklers, and closure of the main sprinkler control valve, i.e., the house control valve, will shut off the domestic water supply.

Section 2-3.3 - Delete

Section 2-3.3.1 - Delete

Section 2-3.3.2 - Delete

Section 2-4.1.1 - Delete the "exception"

Renumber Sections 2-4.1.2 and 2-4.1.3 to be as follows:

Section 2-4.1.2 to be 2-4.1.3

Section 2-4.1.3 to be 2-4.1.4

Add new Section 2-4.1.2 to read as follows:

Section 2-4.1.2 - Except for the meter set controlling combined domestic water and fire sprinkler systems, sectional control valves and other valves if provided in supply pipes to sprinklers shall be locked open and supervised open by one of the following methods:

(a) Central station, proprietary or remote station signaling service, or

(b) Local signaling service that will cause the sounding of an audible signal at a constantly attended point.

Exception- Underground gate valves with roadway boxes need not be supervised.

Section 2-4.2 - Delete and substitute as follows:

Section 2-4.2 - Except in buildings classified in occupancy group J-1, at least one 3 in. (76 mm) single inlet fire department connection shall be provided and located in accordance with Section 27-940 of the Building Code. Buildings classified in occupancy group J-1 shall be provided with siamese connections in accordance with RS 17-2.

Section 2-6 - *Exception No. 1:* - Delete and substitute the following: *Sprinklers are not required in bathrooms, water closet compartments, general rooms and shower rooms.*

Section 2-6 - *Exception No. 2:* - Delete and substitute the following: *Sprinklers are not required in clothes closets, linen closets and pantries.*

Section 2-6 - At the end of the section add the

following:

Location of sprinklers installed in buildings classified in occupancy group J-1 shall be in accordance with the requirements of RS 17-2.

Section 2-7 - Delete and substitute the following:

Section 2-7 - The owner is responsible for the condition of a sprinkler system and shall properly maintain the sprinkler system in accordance with the Fire Department's rules and regulations.

Chapter 3 - Referenced Publications

Delete in its entirety.

Appendix A - Explanatory Material

A-1-1, first paragraph, - Change four to six.

A-1-5.2 - Delete

A-1-5.7 - Delete

A-2-1.3.2 - Delete

A-2-3.3.1 - Delete

Figure A-2-3.2(a), (b) and (c) Delete

Appendix B - Referenced Publications

Delete in its entirety.

NOTE: Subjects that are not covered under this reference standard shall be in accordance with Reference Standard 17-2.

**DOB 6-25-99*

*REFERENCE STANDARD RS 17-2B STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS IN ONE- AND TWO-FAMILY DWELLINGS AND MANUFACTURED HOMES

ANSI/NFPA No. 13D-1994 - Standard for the Installation of Sprinkler Systems in One-and Two-Family Dwellings and Manufactured Homes.

Modifications - The provisions of NFPA No. 13D-1994 shall be subject to the following modifications. The section and paragraph numbers are from that standard.

Preface

Change NFPA 72, *National Fire Alarm Code* to Section 27-979 of the Administrative Code.

Chapter 1 - General Information

Section 1-3 - Delete the definition of Multi-purpose Piping System.

Section 1-3 - Delete the definition of Pre-engineered System.

Section 1-5.2 - Revise the exception to read: Listing may be waived for tanks and pumps.

Section 1-5.3 - Delete

Section 1-5.4 - Delete and substitute with the following:

Section 1-5.4 - Testing of a system can be accomplished by pressurizing the system 50 pounds (3.5 bar) above the normal system operating pressure and checking visually for leakage at each joint or coupling.

Fire Department connections are not required for systems covered by this standard, but may be installed

Reference Standard 17

at the discretion of the owner. In these cases, hydrostatic tests in accordance with Reference Standard RS 17-2 are necessary.

Dry systems should also be tested by placing the system under 40 pounds (2.8 bar) air pressure. Any leak that results in a drop in system pressure greater than 2 psi (0.14 bar) in 24 hours should be corrected. Check for leaks using soapy water brushed on each joint or coupling. Leaks will be shown by the presence of bubbles. This test should be made prior to concealing of piping.

Chapter 2 – Water Supply

Section 2-2 – Add subparagraph (e) as follows:

(e) A common supply main to the building serving both sprinkler and domestic uses may be used if provision is made to prevent flow on the domestic water system upon operation of sprinklers, and closure of the main sprinkler control valve, i.e., house control valve, will shut off the domestic water supply.

Section 2-3 - Delete

Chapter 3 - System Components

Section 3-1.1 - Delete the exceptions.

Add new Section 3-1.5 to read as follows:

Section 3-1.5 - Except for the meter set controlling combined domestic water and fire sprinkler systems, sectional control valves and other valves if provided in supply pipes to sprinklers shall be locked open and supervised open by one of the following methods:

(a) Central station, proprietary or remote station signaling service, or

(b) Local signaling service that will cause the sounding of an audible signal.

Exception - Underground gate valves with roadway boxes need not be supervised.

Section 3-3.2 - Delete and substitute the following:

Section 3-3.2 - Other types of pipe or tubes may be used, but only those investigated and listed for this service by a nationally recognized testing and inspection agency in accordance with Underwriters Laboratory Standard 1821 and 1887. The use of pipe or tube other than that described above must involve consideration of many factors, e.g.,

- (a) Pressure rating
- (b) Beam strength (hangers)
- (c) Corrosion (chemical and electrolytic)
- (d) Resistance to failure when exposed to elevated temperatures
- (e) Methods of joining (strength, permanence, fire hazard)
- (f) Availability of fittings (for sprinkler outlets and proper routings)
- (g) Physical characteristics related to integrity during earthquakes
- (h) Toxicity
- (i) Combustibility
- (j) Movement during sprinkler operation (water distribution)

Nonmetallic pipe shall comply with the portions of the ASTM standards specified in Table 3-3.2 that apply to fire

protection service in addition to the provisions of this paragraph. Nonmetallic pipe shall only be used in wet pipe systems. Nonmetallic pipe shall be installed in accordance with the manufacturer's installation instructions, and in accordance with rules promulgated by the Commissioner of Buildings.

Table 3-3.2 - Delete Specification for Special Listed Polybutylene (PB) Pipe and ASTM D3309.

Section 3-3.6 - Delete and substitute the following:

Section 3-3.6 - Joints for the connection of copper tube or threadless pipe shall be brazed. Brazing filler metal classed BCuP-5, BAG-2 (ANSI/AWS A5.8-89) or other approved methods may be used. Lead free solder joints may be permitted for wet pipe systems when the temperature classification of the installed sprinklers is Ordinary or Intermediate.

Section 3-3.7 - Delete and substitute the following:

Section 3-3.7 - Other types of fittings may be used, but only those investigated and listed for this service by a nationally recognized testing and inspection agency in accordance with Underwriters Laboratory Standard 1821 and 1887. The use of fittings other than that described above must involve consideration of many factors as described in Section 3-3.2. Nonmetallic pipe fittings shall comply with the portions of the ASTM standards specified in Table 3-3.7 that apply to fire protection service in addition to the provisions of this paragraph. Nonmetallic pipe fittings shall only be used in wet pipe systems. Nonmetallic pipe fittings shall be installed in accordance with the manufacturer's installation instructions, and in accordance with rules promulgated by the Commissioner of Buildings.

Section 3-6 – In the *Exception*, change *NFPA 72, National Fire Alarm Code* to *Section 27-979 of the Administrative Code*.

Chapter 4 - System Design

Section 4-3.3.3.1 - Add "The use of antifreeze solutions other than glycerine-water in sprinkler systems using plastic pipe shall not be permitted."

Section 4-3.3.4 shall be modified to read as follows:

Section 4-3.3.4 - Arrangement of supply piping and valves. - All permitted antifreeze solutions shall be installed in accordance with RS 17-2.

Figure 4-3.3.4 - Delete and substitute with:

Figure 5-5.4 - "Detail of Typical Installation" of Reference Standard 17-2.

Section 4-4.1 - Exception No. 1 - Delete NFPA 13, Standard for the installation of sprinkler systems and revise to read "Reference Standard 17-2."

Section 4-4.2 - Revise to read as follows:

Section 4-4.2 - Minimum Pipe Size - Minimum pipe size including copper and any other acceptable piping shall be 3/4 in. (19 mm).

Section 4-4.3 - Delete the exception.

Reference Standard 17

Section 4-6 shall be modified to read as follows:
"Sprinklers shall be installed in all areas with the following exceptions:

Exception No. 1. Sprinklers are not required in attics not provided with floors.

Exception No. 2 Sprinklers are not required in clothes closets, linen closets and pantries.

Exception No. 3. Sprinklers are not required in bathrooms, water closet compartments, general toilet rooms and shower rooms.

Exception No. 4. Sprinklers are not required in garages, provided that at least one sprinkler head is located within 3 feet (914mm) of any communicating opening between the garage and the dwelling.

Exception No. 5. Sprinklers are not required in open attached porches, carports and similar structures."

Chapter 5 - Limited Area Dwellings

Delete in its entirety.

Chapter 6 - Referenced Publications

Delete in its entirety.

Appendix A - Explanatory Material

Section A-1-1 - Delete third sentence of first paragraph and revise second sentence to read:

"Residential portions of any other buildings shall be protected with residential sprinklers in accordance with the New York City Building Code."

Revise last paragraph to read "For protection of multiple dwellings, refer to the New York City Building Code."

Section A-1-2 – Delete

Section A-1-3 - Revise to read "System control valves shall be the indicating type and shall be approved/accepted type."

Section A-1.4 – Delete

Section A-1-5.4 – Delete

Section A-2.2 - Delete entire section including all related diagrams, except for the following:

"When a tank is used for both domestic and fire protection purposes, a low water alarm activated when the water level falls below 110 percent of the minimum quantity specified in Section 2-1 should be provided".

Section A-2.3 - Delete all related diagrams.

Section A-2.3(a) – Delete

Section A-3-3.1 – Delete

Section A-3-3.2 - Delete

Section A-3-3.7 – Delete

Section A-3-5.6.1 - Revise to read as follows:

Section A-3-5.6.1 - Decorative painting of residential sprinklers is not to be confused with the temperature identification colors as referenced in Reference Standard 17-2.

Section A-5-5 – Delete

Table A-1.2(a) and (b) – Delete

Appendix B - Referenced Publications

Delete in its entirety.

** DOB 6-25-99*

**REFERENCE STANDARD RS 17-3

Standards for the Installation of Fire, Sprinkler, Standpipe, Smoke Detection, Oxygen, Nitrous Oxide, and other Alarm and Extinguishing Systems

"Installation, source of energy, wiring and other requirements shall comply with the applicable provisions of Sections one through fourteen, inclusive; provided, however, that fire protection pre-signal systems for buildings in Occupancy Group G, of Construction Group 1-A (fireproof) may comply with the provisions, of Section 15 in lieu of sections 1 through 14, when such pre-signal systems are installed or existing systems are modified to provide fire alarm signal service under adverse malicious false alarm conditions, and when permitted by the Fire Commissioner."

**515-75 BCR*

1. A. SOURCES OF ELECTRICAL POWER

Two sources of electrical power shall be provided as follows:

(1) The primary source shall be generated electric power not exceeding 277/480 volts, supplied by utility company power, or isolated plant.

(2) The secondary source shall be an emergency power system (as per 27-396), emergency generator and/or battery power.

One source of power shall be connected to the system at all times. The primary and secondary power sources shall be so arranged and controlled by automatic transfer switches and/or circuitry that when the primary source of power fails, the secondary source will be connected automatically to the fire alarm signal system. Intermediary devices between the system supply and the source of power, other than fused disconnect switches, transformers, fused cutouts and automatic transfer switches, are prohibited. Such disconnect switches, cutouts, transformers and automatic transfer switches shall supply only the fire alarm system and other systems covered by this reference standard. When the utility company requires the installation of metering current transformers, the system supply shall be connected on the load side of the current transformers. All installations shall comply with the applicable sections of the New York City Electrical Code." The primary source of power and the secondary source (if emergency power system or generator) shall each be provided with a means of disconnect from the fire alarm system. For buildings supplied at 120/208 volts, each disconnect shall consist of a fused cutout panel, utilizing cartridge fuses, with provision for interrupting the unfused neutral and all ungrounded conductors. The neutral shall be provided with a removable solid copper bar. The incoming service neutral shall be bonded to the metallic housing of the cutout panel on the line side of the removable bar. The fused cutout panel housing shall

Reference Standard 17

consist of a locked metallic cabinet with hinged door, painted fire department red, and permanently identified as to the system served. For buildings served at 265/460 volts, the primary and secondary service disconnects shall be fused disconnect switches (in lieu of fused cutout panels) in locked, red painted, permanently identified enclosures. The service voltage shall be transformed to 120/208 volts and a fused cutout panel provided within 5 feet of the transformer on the 120/208-volt side. The incoming supply connections shall comply with the NYC Electrical Code, and the fused cutout panel shall comply with the requirements specified herein before.

B. PRIMARY POWER SOURCE

(1) The primary service to the fire alarm system shall be so arranged that the building source of supply can be disconnected without de-energizing the fire alarm supply. To accomplish this, the primary fire alarm supply shall be connected ahead of all building over current protection and/or switching devices.

(2) Partial systems such as strobe light control panels, partial fire alarm, automatic smoke/heat detection, and sprinkler alarm subsystems and/or other associated systems may be connected to an emergency supply riser panel via a tapped connection, and an identified, locked fused cutout box located within 5 feet of the tap.

Where an emergency power system (E.P.S.) is provided in accordance with section 27-396.4, it shall be connected to the emergency supply riser. Where an E.P.S. is not available, the emergency supply riser shall be connected to a tap ahead of the service switch.

C. SECONDARY POWER SOURCE

The secondary service to the fire alarm system shall be provided as follows:

(1) If the building has a required emergency power system, the secondary source shall be the emergency power system, regardless of whether the primary source is utility company power or an isolated plant.

(2) If the building has an emergency generator supplying power to any of the loads listed in 27-396.4, the secondary source shall be the generator.

(3) For all other buildings, the secondary source shall be a battery supply provided in accordance with Reference Standard 17-5 for storage batteries. The battery shall be designed for 24-hour supervisory operation of the system, followed by

(a) 6 hour total system load for systems with voice communication capability (A 45 minute period of voice/alarm operation at maximum connected load shall be considered equivalent to 6 hours of total system operation), or

(b) 15 minutes of total system load for systems without voice capability.

(4) Partial systems and/or associated systems may derive their secondary supply from batteries whether or not the

building is equipped with an emergency generator. Batteries shall be designed for 24-hour supervisory operation followed by 5 minutes of total system load.

All alterations to any existing approved fire alarm system involving or consisting of the replacement of the Fire Command Station, Fire Alarm Control Panel, Central Processing Unit, Floor Control Units, Remote Control Units, Data Gathering Panels, Terminal Transmission Board, and other similar or equivalent controls or control panels shall be required to comply with Section C(3) above. For systems in buildings which are in compliance with Sections C(1) or C(2) above, compliance with Section C(3) is optional.

2. Classification of Systems. - Systems shall be classified as follows:

(a) Manual interior fire alarm.

(b) Standpipe fire line telephone and signaling.

(c) Automatic heat, smoke, or products-of-combustion fire detecting and alarm, as follows:

(1) Fixed temperature solder or bimetallic spot type heat detection.

(2) Fixed temperature heat detecting wire.

(3) Rate-of-rise pneumatic tube heat detection.

(4) Photoelectric type smoke detection.

(5) Products-of-combustion ionization detection.

(d) CO₂ extinguishing.

(e) Hood smothering and fan shutdown.

(f) Sprinkler alarm.

(g) Ventilation duct smoke and fire detection and fan shutdown.

(h) Oxygen and nitrous oxide alarm.

(i) Escalator fire door alarm.

Where fire alarm, sprinkler alarm, and/or automatic fire detection systems are installed in the same building, wiring interconnections shall be provided between the control boards of the Systems, and necessary actuating relays and transmitters shall be provided in the control boards, so that actuation of the sprinkler alarm and/or fire detection systems will activate the fire alarm system, and so that actuation of the fire alarm system will de-energize all fans, with the exception of those fans used for the Stair Pressurization System, controlled by the automatic detection system.

3. WIRING

A. Power Conductors (Above 75 volts) shall be:

(1) Copper: THHN, THWN/THHN, TFFN, TFN, FEP, RHH, RHW-2, XHH, or XHHW; minimum 600 volts; 90 C; for installation in rigid metallic conduit (RMC), intermediate metallic conduit (IMC) or electric metallic tubing (EMT).

(2) Cable type MI, M.E.A. approved for 2-hour fire resistance rating.

B. Low Voltage Conductors (75 volts and less) shall be:

Reference Standard 17

(1) Copper; THHN, THWN/THHN, TFFN, TFN, FEP, RHH, RHW-2, XHH, XHHW, minimum 600 volts; 90 C; for installation in rigid metallic conduit (RMC), intermediate metallic conduit (IMC) or electric metallic tubing (EMT)

(2) Minimum wire size No.18 AWG.

(3) Multiconductor cables run in raceways, or exposed as described hereinafter, shall meet the following additional requirements:

(a) Type FPLP only; minimum insulation thickness 15 mils; minimum temperature 150 C; colored red.

(b) Red colored jacket overall; minimum thickness 25 mils.

(c) Cable printing as per UL1424; must bear additional description "ALSO CLASSIFIED NYC CERT. FIRE ALARM CABLE" legible without removing jacket.

C. Installation of Conductors and Raceway shall be in accordance with the following:

(1) Power conductors shall not be installed in common raceways with low voltage conductors.

(2) Comply with applicable requirements of New York City Electrical Code, except where requirements are exceeded by this Reference Standard.

(3) Conductors other than M.I. cable shall be run in raceway, except as specifically described below.

(4) Multi-conductor cables may be installed without raceway protection where cable is protected by building construction. Where not protected by building construction, cables shall be located 8 feet or more above the finished floor and not subject to physical tampering or hazard. Locations within eight feet of the finished floor that are deemed as "protected by building construction" shall include raised floors, shafts, telephone and communication equipment rooms and closets, and rooms used exclusively for fire alarm system equipment. In any suppression and extinguishing system activated by automatic fire detection, including, but not limited to, pre-action sprinkler, deluge sprinkler, clean air agent, halon, range hood, CO₂ and dry chemical, multi-conductor cables shall be installed in RMC, IMC, or EMT.

(5) All wiring within mechanical and elevator equipment rooms shall be run in raceway.

(6) Raceways run within 8 feet of finished floor in garage areas, loading docks, mechanical rooms, and elsewhere where subject to mechanical damage, shall be rigid galvanized steel conduit only.

(7) Where wiring is required to be run in raceway, install conductors in rigid metallic conduit (RMC), intermediate metallic conduit (IMC) or electric metallic tubing (EMT), except that multi-conductor cables may also be run in surface metal raceway. Flexible metallic conduit, not exceeding 36" in length, shall be permitted for final connections to initiating and notification devices. Conductors for other electrical systems shall not be installed in raceways containing REFERENCE STANDARD 17 conductors.

(8) Where allowed to be run without raceway protection, multi-conductor cables shall be installed as follows:

(a) Cables shall not depend on ceiling media, pipes, ducts, conduits, or equipment for support. Support independently from the building structure.

(b) Secure by cable ties, straps or similar fittings, so designed and installed as not to damage the cable. Secure in place at intervals not exceeding 5'-0" on centers and within 12" of every associated cabinet, box or fitting.

(9) Installation of raceways, boxes and cabinets shall comply with the following general requirements.

(a) Covers of boxes and cabinets shall be painted red and permanently identified as to their use.

(b) Penetrations of fire-rated walls, floors or ceilings shall be fire stopped.

(c) Within stairways, raceways within 8 feet of the floor shall not be installed so as to reduce or obstruct the stairway radius.

(d) Raceways or cables shall not penetrate top of any equipment box or cabinet.

(10) All conduits supplying 120-volt power to the fire command station and/or fire alarm control unit and/or to outlying control cabinets, shall contain a green insulated grounding conductor sized in accordance with the New York City Electrical Code (#10 AWG minimum). The grounding conductor shall be connected to the ground bus or other suitable grounding terminal in each box and cabinet in which it enters. At the fuse cutout panel supplying the fire alarm system, provide a grounding electrode conductor sized and installed in accordance with the New York City Electrical Code (#10 AWG minimum).

(11) For cabinets whose 120-volt supply is not derived from the main fire alarm system cutout panel, provide green insulated separate grounding electrode conductors, sized and installed as per New York City Electrical Code (#10 AWG minimum). In steel-framed buildings, a connection to local steel structure will be acceptable.

(12) Splices and terminations of wires and cables shall be as follows:

(a) Permitted only in boxes or cabinets specifically approved for the purpose.

(b) Utilize mechanical connections specifically approved by U.L. 486 A & C for the conductors, or if soldered, first joined so as to be mechanically and electrically secure prior to soldering and insulating. Temperature rating of completed splices shall equal or exceed the temperature rating of the highest rated conductor.

(13) Wiring for audible and visual alarm notification devices shall be arranged so that a loss of a portion of the wiring on a floor will not render more than 60% of the devices of each type inoperative, and the devices shall be so connected to the circuitry (i.e., by means of alternate circuits) as to maintain at least partial audibility/visibility throughout the entire floor.

Reference Standard 17

4. Fire Alarm Sending Stations. -

*(a) In manual fire alarm signal systems, the metal case enclosing exposed or surface alarm boxes shall be of cast iron or cast No. 43 aluminum or approved aluminum-zinc alloy, and shall be drilled and tapped to receive the conduit. Where exposed to moisture, the box shall be closed in a weatherproof outer shell. In new buildings, approved galvanized sheet steel back-boxes embedded in the wall may be used and the conduits shall be secured by lock nuts and bushings.

**Local Law 16-1984*

(1) A floor warden station with a speaker mechanism having a fire resistant assembly and a manual fire alarm station may be installed in the same housing. A self-restoring push button that will silence an alarm speaker while being held in place, shall be required wherever such speaker is within 8 feet of a floor warden station.

(b) All current-carrying parts shall be insulated from parts carrying current of opposite polarity with approved insulating material.

(c) All coded pull-lever type stations shall be constructed with a door or other approved means to protect the pull lever against accidental injury. The wording "IN CASE OF FIRE - OPEN DOOR AND PULL DOWN LEVER" in raised letters, or equivalent instructions, shall appear on the door.

(d) In systems using break-glass or break-rod type stations, at least one extra glass rod or glass pane for each station in the system shall be kept in the building. Break-glass boxes shall have the glass rod or pane mounted on the surface of the station covers or mounted internally in such a manner that the glass must be broken to actuate the sending station, Suitable hammers on chains attached to the boxes, or other approved means of breaking the glass shall be provided.

(e) The box or station of a coded system shall be so designed that once started, the proper transmission of a complete set of signals cannot be interfered with by manipulation of its starting device.

(f) Each closed circuit coded box or station shall be arranged to send a definite code of signals to indicate the floor or portion of the floor on which it is located.

(g) Not less than 3, nor more than 20, taps or blasts shall be given at each revolution of the code wheel. The code wheel shall revolve at least four times for each operation of its starting device and shall be of metal properly insulated from ground.

(h) Boxes or stations used in systems in which whistles, vibrating bells, or horns are employed shall be so timed that the sounding devices will give the code signals clearly.

(i) Contact points shall be in multiple.

(j) Contact points and contacts of the testing devices shall be of silver or other approved material and of the scraping type. The contact points and contacts shall be secured in a substantial manner to springs of phosphor

bronze or other approved material, and shall be so designed as to positively break a circuit carrying 0.10 ampere at 250 volts under actual operating conditions.

(k) Lever boxes shall be so designed as to automatically wind when the lever is pulled for an alarm. Boxes requiring glass replacements shall be so arranged that replacement cannot be made without resetting the mechanism for another alarm.

(l) Where it becomes necessary to install more than one set of contacts operating from code wheel, approval must be obtained from the fire commissioner before the installation. This shall not include pre-signal features. The box shall have its code signal number plainly marked thereon.

(m) Uncoded boxes. -

(1) Uncoded closed circuit fire alarm stations may be operated by a break-glass or break-rod or a pull lever device so arranged that the alarm cannot be interfered with except by resetting or replacement of the glass or rod by an authorized person.

(2) The construction and materials shall be equivalent to that of the standard approved type coded closed circuit station, except that the contacts shall be of sufficient capacity to safely carry out the entire operating current of the gong circuit without excessive heating.

(n) Station testing devices. -

(1) Each fire alarm system shall be provided with an auxiliary device to test the signaling devices. The auxiliary device shall be located in one of the alarm boxes or mounted on the control board. Such testing device shall be arranged so that the test is made without operating the break wheel of the box or interfering with the dual operating feature.

(2) Provisions shall be made for a silent test of coded alarm box mechanisms without operating the signaling devices. Such test device shall be designed to prevent any person, except those in authority, from operating the same and to prevent the possibility of the box being left inoperative after the test.

5. Alarm Sounding Devices. -

*(a) Alarm sounding devices shall be sufficient in number to be clearly audible to all occupants of a building. Approved gongs shall be provided as the sounding devices. Where gongs or bells are not audible, approved horns or whistles may be provided. Chimes and other alarm sounding devices may be installed only with the approval of the commissioner.

(b) Gong shells shall be pinned to prevent turning and then securely fastened to their supports by a machine cap screw at least 3/8 in. in diameter.

(c) Gong shells shall be covered with a rust preventive. The gong support and gong frames shall be cast in one piece.

**Local Law 16-1984*

6. Fire Alarm System Control Boards. -

(a) Supervising circuit. -

Reference Standard 17

(1) A small current flow shall be maintained to constantly supervise each circuit. A millimeter, or other approved current indicator, shall be provided and connected so as to indicate the supervising current.

(2) The supervising circuit shall be provided with a trouble bell operating an open circuit and arranged to ring continuously in case of failure of the system. The trouble bell shall be so located that it will be within audible range of a responsible person in the building.

(3) Trouble bells may be fitted with silencing switches only when the switch is connected in such a manner that the act of silencing the bell by the operation of the switch automatically transfers the trouble signal to a red lamp on the control board. When the trouble has been repaired, the alarm bell shall ring until the silencing switch has been reset to operate under normal conditions.

(4) The trouble bell shall be of the vibrating type and shall give a distinctive signal.

(b) Protection of sending and sounding devices. -

(1) In fire alarm signal systems, moving parts of sending stations and sounding devices shall be enclosed in metal casings, made dust proof and damp proof when necessary, and clearly marked with instruction for use.

(2) Whenever necessary, hammer rods of gongs shall be suitably protected against mechanical damage by the use of a guard or equivalent means. If subject to possible mechanical damage, the entire device shall also be enclosed in a protecting case made of approved wire netting or perforated metal. All casings shall be insulated from current carrying parts, but shall be grounded to the conduit.

(c) Standards of electric alarm apparatus. -All electrically actuated apparatus used in fire alarm systems shall be so designed and constructed that it will operate satisfactorily at a current flow of 15 per cent above or below the normal operating current.

(d) Insulation. -

(1) Insulating materials used shall be varnished cambric, bakelite, mica, or equivalent insulating material.

(2) The use of fiber or paper as an insulating material for the fire alarm signal systems is prohibited.

(3) The insulating materials used shall be capable of withstanding an insulation breakdown test of 1,000 volts a.c. plus twice operating voltage applied for 1 minute.

(e) Electromagnets. -

(1) Electromagnet windings shall be impregnated with an insulating, moisture repelling compound of the silicone or epoxy type.

(2) Electromagnet coils used on alternating current, when composed of enameled wire, shall have an additional approved insulation on each wire. The coils may be of the form-wound type.

(3) A protective cover to prevent mechanical damage shall be provided over the entire coil.

(4) Electromagnetic coils shall be fastened to prevent floating.

(5) Electromagnet cores shall be of the best grade of ferrous material so as to reduce to a minimum the possibility of failure due to residual magnetism.

(6) Electromagnet cores for use on alternating current shall be of laminated construction or other approved method to prevent heating and promote efficiency.

(7) Electromagnet cores of relays and gongs shall be treated to prevent corrosion. Paint or varnish shall not be used for this purpose.

(8) Nonmagnetic freeze pins shall be used to prevent two magnetic surfaces from making physical contact with each other.

(f) Relays. -

(1) The armatures of all relays shall depend on gravity or magnetic attraction for their operation. However, armature operation may be initiated by flat-type springs when permitted by the commissioner. The use of spiral springs is prohibited.

(2) Adjustments shall be of such a character that they can be securely locked.

(3) Contact points shall be of sufficient area to carry the current used in operation and to insure long life. They shall be of pure silver or other approved material and properly riveted to their support. Contact arms shall be of phosphor bronze, and shall be of the dead beat type. Contact assemblies shall be of such a character that their operation is of a scraping self-cleaning nature. The use of condensers across contacts in order to absorb the arc in any part of a fire alarm circuit is prohibited.

(4) Relays shall be free from objectionable hum when used on alternating current.

(g) Time limit delay device. -

(1) All gong circuit shell and special signal apparatus may be protected by a time limit delay device. This time limit delay device shall consist of a heating coil so designed that the normal operating current will have little or no effect upon a thermostatic bimetallic bar or strip contained therein. Any abnormal increase over operating current or the continued cumulative heating effect thereof after a period of at least 3 minutes, but not more than 20 minutes, shall cause the thermostatic element to expand. The expansion of this element shall automatically open the source of current supply to the gongs or devices protected. The operation of the time limit delay device shall cause the trouble bell to ring.

(2) Time limit delay devices shall be so connected in the fire alarm circuit that their operation will not open the fire alarm box circuits.

(3) Where, due to the extent of the installation, it becomes necessary to install a number of time limit delay devices, the operation of a single time delay device shall not affect other sounding devices similarly protected.

(4) A contactor relay to operate the sounding devices shall be provided on all direct gong circuits exceeding two in number. Gong circuits not requiring contactor

Reference Standard 17

relays shall be operated by contacts properly phased for the armature of the box circuit relay.

(5) A separate time limit delay device, contactor supervisory relay and gong supervisory relay, shall be provided for each four gong circuits or fraction thereof.

(h) Switches. -Triple pole, double throw, broken back knife switches properly supervised, and connected to emergency resistors, shall be provided on all box and gong circuits when the circuits exceed three in number.

(i) Instruments. -A separate approved milliammeter, or other approved current indicator, shall be provided for the box circuit and each four gong circuits on the control board when the gong circuits exceed three in number. A separate milliammeter shall be provided to indicate the supervisory current of contactor relays and emergency switch circuits. This meter shall be known as the "board meter."

(j) Resistors. -

(1) Resistors shall be of the vitreous enameled type and shall be mounted on the front or face of control panels. Wire wound resistors, protected by a suitable metal guard, may be used when permitted by the commissioner. Ferrule or knife contact type resistors shall not be used.

(2) A protective resistor shall be placed in the negative, or live, lead of all box circuits to protect the contacts of the boxes in the event of a ground. This resistor shall have a resistance of at least 300 ohms, but no more than 750 ohms.

(3) All relays, current indicators, resistors, time limit delay devices, and other apparatus used in connection with the operation and supervision of closed circuit fire alarm signal systems shall be properly mounted on a panel of approved material in a metal cabinet provided with lock and key. The control board shall be located in a place where it will be subject to the least vibration and least chance of mechanical damage. The location shall be free from moisture, flammable gases, and dust. Furthermore, the control panel shall be located so that it can be kept under the frequent view of a responsible occupant of the building delegated by the owner to be in charge.

(4) Control board panels shall be of insulating material such as ebony asbestos, bakelite, or other approved materials at least 1/2 in. thick. Control boards mounted in each cabinet shall be securely fastened in each corner.

(5) Provision shall be made for sufficient wire gutter space around the panel. Gutter space shall be a minimum of 2 in. at sides, top, and bottom. Wire in gutter space shall be properly laced in a neat and workmanlike manner on all control boards.

(6) Conduit knockouts shall not be provided in the top of the control board cabinet.

(7) A wiring diagram of the alarm system approved by the commissioner and the approved card of instruction properly marked and securely fastened shall be provided within the control board cabinet. When it becomes

necessary to mount the diagram outside of the cabinet, the diagram shall be framed under glass or equivalent material.

(8) All control board cabinets shall be provided with sight holes and glass panels to make meters on the inside of the cabinets visible from the outside.

*(9) Control boards may be of the solid state circuitry type with modular construction and replacement components.

**Local Law 16-1984*

7. Painting of Equipment. -All enclosing cases for fire alarm, sprinkler alarm, smoke detection, and oxygen and nitrous oxide alarm apparatus shall be painted fire department red, except where approval is given by the commissioner to deviate from this requirement.

8. Closed Circuit Annunciators. -

(a) Annunciators used in connection with unit and general fire alarm systems shall be of an approved closed circuit type. The annunciator shall have approved types of relays equipped with a target shutter or other indicating device. The indicating device shall have marked thereon a description of the purpose it serves. The printed designation on unit or building annunciator's indicators shall be legible. The mechanism shall be so arranged that once operated the indicating device must be reset manually.

(b) A unit annunciator shall be so designed that the operation of any station in the unit causes a visible and audible signal. The unit annunciator shall be actuated by contact on a code wheel of the fire alarm station, or by contact on a relay connected to the fire alarm box circuit. In no case shall the station fire alarm circuit be used for this purpose.

(c) Trouble annunciators shall be so arranged that the indicating device will reset automatically when the cause of the trouble has been removed. The trouble annunciator shall be so designed that it will indicate visible and audible trouble signals in the event of trouble occurring on any circuit panelboard of unit annunciators. The trouble annunciator shall be actuated by the operation of contacts on all supervisory relays. Each relay of this annunciator shall be provided with two sets of contacts so arranged that one set will operate the 110-volt trouble signal, and the other set will actuate the register, if a register is used.

(d) A trouble buzzer switch lamp shall be mounted on the inside of each unit annunciator cabinet on the panel.

(e) A trouble bell, switch, and lamp shall be mounted on the inside of each trouble annunciator cabinet on the panel. Trouble bell may be placed at a distance from the annunciator by approval of the commissioner.

(f) Relay drops of annunciator shall be so designed that vibration from without or that caused by the trouble signal within will not operate the indicating devices.

(g) All annunciators shall be installed in a separate red enameled steel cabinet provided with an approved

Reference Standard 17

lock and key. Annunciators shall be marked in white letters at least 1 in. high with the words: "FIRE ALARM ANNUNCIATOR, ZONE" or "FIRE ALARM TROUBLE ANNUNCIATOR", whichever the case may be.

9. Automatic Heat and Smoke Fire Detection Systems. -

(a) Classifications. -Automatic heat and smoke fire detection systems shall be classified as follows:

(1) Fixed temperature solder or bimetallic spot-type heat detection.

(2) Fixed temperature heat detecting wire.

(3) Rate-of-rise pneumatic-tube heat detection.

(4) Photoelectric-type smoke detection.

(5) Products-of-combustion ionization detection.

(b) Plans. -Floor layouts shall show the automatic fire alarm signal equipment and its location, number of thermostatic heads, transmitters, control board, and sounding apparatus; also, all exits, partitions, and enclosures shall be identified on the layouts. The layouts shall be approved by the commissioner and the fire commissioner before work is started on the installation.

(c) Wiring and electrical apparatus. -

(1) All electrical wiring, signal apparatus, and thermostatic actuating devices shall be connected and operated on closed supervised electric circuits, and conform to the requirements for the installation of interior fire alarm systems.

(2) Approved automatic-type systems shall be installed under the supervision of the commissioner.

(3) When installed in connection with approved interior alarm systems, automatic systems shall have this connection made through an approved combination manual and automatic transmitter.

(4) When installed in connection with dry valves or other fire protective devices, automatic systems shall actuate the dry valve or devices through an approved magnetic trip.

(5) In automatically operated systems, each system shall have at least one manual fire alarm box as an auxiliary means for actuating the alarm system.

(6) Automatic systems shall be arranged to transmit a prescribed code signal as required by the fire commissioner.

(7) Closed circuit annunciators shall be provided in connection with automatic thermostatic systems when required by the fire commissioner.

(8) Transmitters, manual alarm boxes, testing boxes, and annunciators shall be so installed that a considerable jar cannot start their mechanism.

(9) Transmitters that require rewinding after operation shall be provided with a trouble bell to indicate a run-down condition.

(10) The trouble bell shall be arranged to give a distinctive signal different in tone from the trouble bell supervising the thermostatic alarm circuit.

(11) Each automatic thermostatic system shall have one or more combination manual and automatic transmitters located in a natural path of escape for each thermostatic

circuit, wherever the thermostatic alarm actuates the interior alarm system.

(12) All thermostatic devices shall operate on a closed supervised electric circuit.

(13) The thermostatic wiring may return to the control board and the end line resistor mounted thereon. This end line resistor may be in the form of a supervising relay.

(d) Control boards. -Thermostatic automatic systems shall be operated from properly supervised approved closed circuit control boards installed in a locked metal cabinet, which shall be painted fire department red and marked in 1 in. high white letters with the words "AUTOMATIC THERMOSTATIC FIRE ALARM".

*** (e) Signal apparatus.** -Gongs, horns, or bells, shall be provided, where shown on plans in connection with each thermostatic alarm system, so that the signals will be clearly audible throughout the building or portion of the building requiring a fire alarm system. All thermostatic alarm systems shall be connected to an approved central office for transmission of an early alarm to the fire department.

**149-1975 BCR*

(f) Testing. -The thermostatic alarm system shall be so arranged that a periodic test of the entire system can be made by the person in charge of the building.

(g) Thermostat installation. -

(1) Thermostats shall be placed throughout the building, or portion of the building, including the inside of all closets, cellars, basements, lofts, and elevator wells, and under stairs as shown on approved plans.

(2) No portion of the building shall be exempt without written approval of the commissioner.

(3) Approval shall be obtained before the installation of high-temperature thermostats in boiler rooms, heating boxes, skylights, and other extra hazardous locations.

(4) The distribution of thermostatic heads and devices shall be in accordance with the requirements of reference standard RS 17-5 and as required herein.

(5) The distance from a wall or partition to a thermostat shall not exceed 1/2 the distance between thermostats in the same direction.

(6) A line of thermostats shall be run on each side of partitions.

(7) Spot thermostats of the solder type shall be arranged on smooth ceiling not more than 15 ft. apart, and at intervals of 15 ft. on each line.

(8) On irregular ceilings the thermostats shall follow the spacing as required in (7) above as near as possible, except that in no case shall the area protected by any signal head exceed 225 sq. ft.

(9) In ceilings on which there are bays, one or more heads shall be placed in each bay so the area protected does not exceed 225 sq. ft. for any head.

(10) Not more than 65 heads shall be installed on any supervised circuits.

Reference Standard 17

(11) A thermostatic circuit shall not serve or protect more than the area of any one floor or story, except by special permission.

(h) Fire detecting wire systems. -

(1) Thermostatic systems of the fire-detecting-wire type shall have the thermostatic wire so arranged and installed that there is minimum possibility of the wire being damaged.

(2) Where necessary, fire-detecting wire shall be protected against mechanical injury.

a. Each circuit shall consist of a continuous length of fire-detecting wire not exceeding 1,000 ft., and shall not protect an area greater than that of any one floor or story, except by special permission.

*b. Lines of fire detecting wire shall be so located throughout the area protected that they shall not be more than 15 feet apart and so that no point on the ceiling will be more than 7 1/2 feet from the nearest point of fire detecting wire, unless of a type approved for greater coverage.

**149-75 BCR*

c. Fire-detecting wire may be run either directly on ceilings or on side walls if the wire is placed not more than 20 in. below the ceiling, or on lower sides of timbers or projections.

d. Fire-detecting wire shall be securely fastened to its support in a manner that will not cause damage to the insulation or the outer braid.

e. Wiring, circuits, and all devices connected thereto shall comply in all respects with the requirements for manual fire alarms.

(i) Rate-of-rise pneumatic tube systems. -

(1) Thermostatic systems of the rate-of-rise pneumatic tube type shall have the pneumatic tubing so arranged and installed that the possibility of mechanical damage is minimized. Where necessary, copper tubing shall be protected against damage.

a. Each circuit shall consist of a continuous length of tubing not exceeding 1,000 ft. without branches or alternative paths.

b. Tubing shall be enclosed in conduit or otherwise insulated or legged in order to isolate signals.

c. In every enclosed space or separate room, there shall be at least 5 per cent of the total length of the exposed tubing or circuit.

d. In no case shall less than 25 ft. of exposed tubing be used in any enclosed space or separate room.

e. Lines of tubing shall be so disposed throughout the area to be protected that they will not be more than 30 ft. apart, and so that no point on the ceiling will be more than 15 ft. from the nearest point of tubing.

f. Tubing must be run either directly on ceilings, or on side walls if the tubing is placed not more than 20 in. below the ceiling, or on lower sides of timbers or projections.

g. In rooms where timbers or other projections form bays more than 1 ft. deep and 8 ft. wide between beam centers, at least one line of tubing must be run in each bay.

h. Wiring circuits and all devices connected thereto shall comply in all respects with the requirements for the manual fire alarms.

i. The service connection for an automatic thermostatic alarm system shall be taken at the street side of the service switch in a manner approved by the commissioner.

(j) Unusual construction. -Approval of the fire commissioner shall be required to install thermostatic devices under floors or roofs of removable-panel construction.

(k) Existing installations. -Thermostatic alarm systems previously installed and approved by the fire commissioner shall be accepted as long as they are maintained in good working order, and there is not a change in building height or construction. Where alterations interfere with the proper distribution of thermostatic heads, additional heads shall be installed.

(l) Photoelectric smoke detection systems. -These systems shall be installed in accordance with the requirements of reference standard RS 17-5. The requirements of the building code affecting the design and operation of smoke detecting systems in duct systems, shall apply.

(m) Products-of-combustion-type ionization detection systems. -These systems shall be installed in accordance with Underwriters' Laboratory requirements.

(n) Unusual construction. -Approval of the fire commissioner shall be required to install thermostatic, photoelectric, or ionization type detection devices under floors or roofs of removable panel construction.

10. CO2 Extinguishing Systems. -Carbon dioxide extinguishing systems shall be installed in accordance with Underwriters' Laboratory requirements.

11. Hood Smothering and Fan Shutdown Systems. -

(a) General. -The requirements of the building code affecting the design and operation of automatic fire extinguishing systems for installation in hoods and ducts that exhaust fumes from commercial cooking equipment, shall apply.

(b) Source of power. -A local source of electric power for the system shall be utilized. Control wiring shall be of the "fail safe" type so that loss of control power will shut off all equipment.

(c) Test switch. -A test switch shall be provided, and wired so as to permit testing of the control wiring against shorts or open-circuits without actuation of the smothering system.

(d) Alarm sounding device. -A local alarm gong shall be provided, and shall sound upon actuation of the smothering system.

Reference Standard 17

12. Central Oxygen and Nitrous Oxide Alarm Systems. - A closed circuit electrical alarm system shall be provided to give visible and audible signals when the pressure in the system varies 8 lbs. above or below the normal line pressure of 50 lbs. Alarm indicating panels shall be so located in the hospital that they are under 24 hr. observation by a responsible person, or persons, delegated by the owner. Additional indicating panels may be provided in other locations subject to the approval of the fire commissioner.

****13. Licensed Contractors.** -Only a person holding a license, or a special license in accordance with the provisions of the New York City electrical code, shall install, alter or repair electrical wiring or apparatus for fire alarm systems in any building. Upon approval by the commissioner, a manufacturer's designated representative may alter or repair a specific fire alarm system.

14. Used or Rebuilt Apparatus. -Used apparatus shall not be reused for any interior fire alarm system until the same has been reconditioned in the shop of an approved manufacturer of interior fire alarm apparatus. Approval shall be obtained from the commissioner prior to installation. The use of reconditioned apparatus whose manufacturer has discontinued manufacturing equipment is prohibited.

***Local Law 16-1984*

***15. Fire Protective Pre-Signal Systems for Class "G" Assembly and Educational Occupancy Buildings in Group 1-A (Fireproof) Construction**

**515-75 BCR*

I - SCOPE

When permitted by the Fire Commissioner, new fire signal system characteristics for pre-signal operation and existing manual coded and non-coded fire station signal modifications for pre-signal operation, shall be in accordance with the following schedule in its entirety and in accordance with Reference Standards RS 17-3, RS 17-3A, RS 17-3B and other applicable standards and permitted only in Class "G" educational occupancy buildings of Group 1-A fireproof construction. Interior alarm systems installed or altered in accordance with this standard shall be designated as "Class G Systems".

II - FUNCTION SCHEDULE

A. Introduction of a time delay between the operation of a coded, master coded or non-coded manual interior fire alarm station and the audible evacuation signal shall be limited to an adjustable interval of 0-180 seconds. The specific duration of the time delay shall be determined by the Fire Commissioner for each specific premises where permitted. The time delay, when instituted by a manual station, shall also be effective for fan shutdown and other auxiliary equipment. There shall be no delay on automatic detection.

B. Alphanumeric annunciation of each manual and each automatic initiation for registration of the location of the device producing the alarm with response instructions determined and authorized by the Fire Commissioner. The registration shall indicate in seconds the delay time remaining for the last signal initiation and shall be visible to and in the immediate vicinity of the Chief Building Administrator's office.

C. Means for cancellation of a manual signal initiation within its introduced time delay accessible only to the Chief Building Administrator. Cancellation shall not be possible for fifty (50%) percent of the delay time expiration.

D. Means for by-passing the introduced time delay after a manual device initiation to produce the evacuation sounding and after normal school hours. The means shall be in the immediate vicinities of the Chief Building Administrator's office and the Building Engineer's office.

E. Master coding for the evacuation signal, providing for single stroke gong systems an evacuation signal comprising four rounds of three single stroke gong soundings only, or providing for dedicated loud speaker systems an evacuation signal comprising a rising tone of three seconds duration starting at a frequency of 400 hertz and ending with a frequency of 1000 hertz, repeated twelve times.

F. Automatic notification to the Fire Department via a class 3 manual station located in the vicinity of the Principal Administrator's office.

III - EQUIPMENT REQUIREMENTS

A. The acceptable means to provide the previously defined characteristics and modifications may include digital electronic circuitry with logic in accordance with the reference standard and as approved and with information interchange in accordance with the reference as approved. Where digital electronic circuitry is used, reliability rates shall be equal to or greater than the equivalent reliability rates for the relay circuitry that may be designed for this purpose. The acceptable means shall be uniform for a given installation. Where digital electronic circuitry is chosen as the acceptable means for a given installation the entire circuitry for this installation shall be digital electronic without exception.

B. The digital electronic alphanumeric annunciation may take one of the following three forms:

1. A fixed lettered display with characters a minimum height of one quarter inch, resulting from the conversion of a manual or automatic device initiation to a unique point.

2. A dot matrix display of a duration at least equal to the duration of the systems interrupt mode and originating in the manner of the fixed lettered display. The matrix shall be a minimum of seven by five dots per character.

3. A cathode ray tube display of duration in the manner of the dot matrix display and origination in the manner of the fixed lettered display. The minimum character height shall be one quarter inch.

Reference Standard 17

In addition the following form shall be provided in conjunction with one of the foregoing:

A teletypewriter is to receive only mode with origination in the matter of the fixed lettered display.

C. Other digital electronic alphanumeric annunciation devices such as liquid crystals or light emitting diodes or the like may be installed for this purpose in lieu of one of the above three forms when approved for use and acceptable to the Fire Commissioner.

D. All system events shall be recorded in hard copy along with the date and time of each particular event. These events shall include the following:

1. The manual or automatic device initiation.
2. The elapsed time in seconds from the manual or automatic initiation to the cancellation or the by-pass as above defined.
3. The elapsed time in seconds from the manual or automatic initiation to the evacuation sounding as above defined.

**E. Where a loud speaker system is used for the evacuation sounding, its amplifiers shall be designed for one hundred and fifty (150%) percent of rated load with a minimum of two discrete amplifiers. The loud speaker system may be used for voice communication, provided the evacuation signal use has priority. Speakers used for fire alarm systems shall be rated for 400 degrees F. and approved by the Board of Standards and Appeals. These speakers and amplifier requirements apply to all systems installed under any and all provisions of this code.

***Local Law 16-1984*

F. All fire protective pre-signal systems shall be operated daily when the building is occupied and a log shall be kept of such operation, accessible to the Commissioner. The hard copy of system events may be considered the required log. All equipment must be approved by Board of Standards and Appeals and acceptable to the Commissioners of Buildings and Fire Department, prior to installation.

IV - DETAILED STANDARDS FOR THE INSTALLATION OF CLASS "G" FIRE SIGNAL SYSTEMS

A. SOURCES OF ELECTRICAL POWER

Two sources of electrical power shall be provided as follows:

- (1) The primary source shall be generated electric power not exceeding 277/480 volts, supplied by utility company power, or isolated plant.
- (2) The secondary source shall be an emergency power system (as per 27-396), emergency generator and/or battery power.

One source of power shall be connected to the system at all times. The primary and secondary power sources shall be so arranged and controlled by automatic transfer switches and/or circuitry that when the primary source of power fails, the secondary source will be connected automatically to the fire alarm signal system. Intermediary devices between the system supply and the source of power, other than fused disconnect switches,

transformers, fused cutouts and automatic transfer switches, are prohibited. Such disconnect switches, cutouts, transformers and automatic transfer switches shall supply only the fire alarm system and other systems covered by this reference standard. When the utility company requires the installation of metering current transformers, the system supply shall be connected on the load side of the current transformers. All installations shall comply with the applicable sections of the New York City Electrical Code. The primary source of power and the secondary source (if emergency power system or generator) shall each be provided with a means of disconnect from the fire alarm system. For buildings supplied at 120/208 volts, each disconnect shall consist of a fused cutout panel, utilizing cartridge fuses, with provision for interrupting the unfused neutral and all ungrounded conductors. The neutral shall be provided with a removable solid copper bar. The incoming service neutral shall be bonded to the metallic housing of the cutout panel on the line side of the removable bar. The fused cutout panel housing shall consist of a locked metallic cabinet with hinged door, painted fire department red, and permanently identified as to the system served. For buildings served at 265/460 volts, the primary and secondary service disconnects shall be fused disconnect switches (in lieu of fused cutout panels) in locked, red painted, permanently identified enclosures. The service voltage shall be transformed to 120/208 volts and a fused cutout panel provided within 5 feet of the transformer on the 120/208-volt side. The incoming supply connections shall comply with the NYC Electrical Code, and the fused cutout panel shall comply with the requirements specified herein before.

B. PRIMARY POWER SOURCE

(1) The primary service to the fire alarm system shall be so arranged that the building source of supply can be disconnected without de-energizing the fire alarm supply. To accomplish this, the primary fire alarm supply shall be connected ahead of all building over current protection and/or switching devices.

(2) Partial systems such as strobe light control panels, partial fire alarm, automatic smoke/heat detection, and sprinkler alarm subsystems and/or other associated systems may be connected to an emergency supply riser panel via a tapped connection, and an identified, locked fused cutout box located within 5 feet of the tap.

Where an emergency power system (E.P.S.) is provided in accordance with section 27-396.4, it shall be connected to the emergency supply riser. Where an E.P.S. is not available, the emergency supply riser shall be connected to a tap ahead of the service switch.

C. SECONDARY POWER SOURCE

The secondary service to the fire alarm system shall be provided as follows:

(1) If the building has a required emergency power system, the secondary source shall be the emergency

Reference Standard 17

power system, regardless of whether the primary source is utility company power or an isolated plant.

(2) If the building has an emergency generator supplying power to any of the loads listed in 27-396.4, the secondary source shall be the generator.

(3) For all other buildings, the secondary source shall be a battery supply provided in accordance with Reference Standard 17-5 for primary batteries. The battery shall be designed for 24-hour supervisory operation of the system, followed by

(a) 6 hour total system load for systems with voice communication capability (A 45 minute period of voice/alarm operation at maximum connected load shall be considered equivalent to 6 hours of total system operation), or

(b) 15 minutes of total system load for systems without voice capability.

(4) Partial systems and/or associated systems may derive their secondary supply from batteries whether or not the building is equipped with an emergency generator. Batteries shall be designed for 24-hour supervisory operation followed by 5 minutes of total system load.

All alterations to any existing approved fire alarm system involving or consisting of the replacement of the Fire Command Station, Fire Alarm Control Panel, Central Processing Unit, Floor Control Units, Remote Control Units, Data Gathering Panels, Terminal Transmission Board, and other similar or equivalent controls or control panels shall be required to comply with Section (C3) above. For systems in buildings which are in compliance with Sections (C)1 or (C2) above, compliance with Section (C3) is optional.

D. ASSOCIATED SYSTEMS

Associated systems listed below shall have their actuation added to the Fire Control Panel:

1. Smoke detection systems.
2. Sprinkler water flow alarms.
3. Thermostatic alarms.
4. Fan shut down for HVAC and automatic smoke exhausters.
5. Stage fire control and deluge systems.
6. Other approved systems.

NOTE: The associated systems listed above shall all be interconnected with the Class "G" fire signal systems and shall have their alarm and common trouble signals indicated at the main control board.

E. WIRING

(1) Power Conductors (Above 75 volts) shall be:

(a) Copper: THHN, THWN/THHN, TFFN, TFN, FEP, RHH, RHW-2, XHH, XHHW; minimum 600 volts; 90 C; for installation in rigid metallic conduit (RMC), intermediate metallic conduit (IMC) or electric metallic tubing (EMT).

(b) Cable type MI, M.E.A. approved for 2-hour fire resistance rating.

(2) Low Voltage Conductors (75 volts and less) shall be:

(a) Copper; THHN, THWN/THHN, TFFN, TFN, FEP, RHH, RHW-2, XHH, XHHW, minimum 600 volts; 90 C; for installation in rigid metallic conduit (RMC), intermediate metallic conduit (IMC) or electric metallic tubing (EMT)

(b) Minimum wire size No.18 AWG.

(c) Multiconductor cables run in raceways, or exposed as described hereinafter, shall meet the following additional requirements:

- Type FPLP only; minimum insulation thickness 15 mils; minimum temperature 150 C; colored red.

- Red colored jacket overall; minimum thickness 25 mils.

- Cable printing as per UL1424; must bear additional description "ALSO CLASSIFIED NYC CERT. FIRE ALARM CABLE" legible without removing jacket.

(3) Installation of Conductors and Raceway shall be in accordance with the following:

(a) Power conductors shall not be installed in common raceways with low voltage conductors.

(b) Comply with applicable requirements of New York City Electrical Code, except where requirements are exceeded by this Reference Standard.

(c) Conductors other than M.I. cable shall be run in raceway, except as specifically described below.

(d) Multi-conductor cables may be installed without raceway protection where cable is protected by building construction. Where not protected by building construction, cables shall be located 8 feet or more above the finished floor and not subject to physical tampering or hazard. Locations within eight feet of the finished floor that are deemed as "protected by building construction" shall include raised floors, shafts, telephone and communication equipment rooms and closets, and rooms used exclusively for fire alarm system equipment. In any suppression and extinguishing system activated by automatic fire detection, including, but not limited to, pre-action sprinkler, deluge sprinkler, clean air agent, halon, range hood, CO₂ and dry chemical, multi-conductor cables shall be installed in RMC, IMC, or EMT.

(e) All wiring within mechanical and elevator equipment rooms shall be run in raceway.

(f) Raceways run within 8 feet of finished floor in garage areas, loading docks, mechanical rooms, and elsewhere where subject to mechanical damage, shall be rigid galvanized steel conduit only.

(g) Where wiring is required to be run in raceway, install conductors in rigid metallic conduit (RMC), intermediate metallic conduit (IMC) or electric metallic tubing (EMT), except that multi-conductor cables may also be run in surface metal raceway. Flexible metallic conduit, not exceeding 36" in length, shall be permitted for final connections to initiating and notification devices. Conductors for other electrical systems shall not be installed in raceways containing REFERENCE STANDARD 17 conductors.

Reference Standard 17

(h) Where allowed to be run without raceway protection, multi-conductor cables shall be installed as follows:

- Cables shall not depend on ceiling media, pipes, ducts, conduits, or equipment for support. Support independently from the building structure.
- Secure by cable ties, straps or similar fittings, so designed and installed as not to damage the cable. Secure in place at intervals not exceeding 5'-0" on centers and within 12" of every associated cabinet, box or fitting.

(i) Installation of raceways, boxes and cabinets shall comply with the following general requirements.

- Covers of boxes and cabinets shall be painted red and permanently identified as to their use.
- Penetrations of fire-rated walls, floors or ceilings shall be fire stopped.
- Within stairways, raceways within 8 feet of the floor shall not be installed so as to reduce or obstruct the stairway radius.
- Raceways or cables shall not penetrate top of any equipment box or cabinet.

(j) All conduits supplying 120-volt power to the fire command station and/or fire alarm control unit and/or to outlying control cabinets, shall contain a green insulated grounding conductor sized in accordance with the New York City Electrical Code (#10 AWG minimum). The grounding conductor shall be connected to the ground bus or other suitable grounding terminal in each box and cabinet in which it enters. At the fuse cutout panel supplying the fire alarm system, provide a grounding electrode conductor sized and installed in accordance with the New York City Electrical Code (#10 AWG minimum).

(k) For cabinets whose 120-volt supply is not derived from the main fire alarm system cutout panel, provide green insulated separate grounding electrode conductors, sized and installed as per New York City Electrical Code (#10 AWG minimum). In steel-framed buildings, a connection to local steel structure will be acceptable.

(l) Splices and terminations of wires and cables shall be as follows:

- Permitted only in boxes or cabinets specifically approved for the purpose.
- Utilize mechanical connections specifically approved by U.L. 486 A & C for the conductors, or if soldered, first joined so as to be mechanically and electrically secure prior to soldering and insulating. Temperature rating of completed splices shall equal or exceed the temperature rating of the highest rated conductor.

(m) Wiring for audible and visual alarm notification devices shall be arranged so that a loss of a portion of the wiring on a floor will not render more than 60% of the devices of each type inoperative, and the devices shall be so connected to the circuitry (i.e., by means of

alternate circuits) as to maintain at least partial audibility/visibility throughout the entire floor.

F. FIRE SIGNAL SENDING STATIONS, CLASS "G" NON-CODED MANUAL STATION AND THE FIRE SIGNAL CONTROL STATION

1. There shall be at least one (1) fire signal sending station in each story of a building located in each path of escape. Additional stations shall be installed so that no point on any floor shall be more than two hundred feet from the nearest station.

2. Doors of sending stations shall be painted Fire Department "red," and lettered: "Fire Emergency - Open Door to Operate", or words to that effect. The instructions for operating the station shall be prominently displayed on an instruction card or, the lever of the station.

3. All current carrying parts shall be insulated from parts carrying current of opposite polarity with approved insulating material.

4. All pull lever type stations shall be constructed with an outer door and means to protect the pull lever against accidental operations. The wording: "In Case of Fire, Open Door and Pull Down Lever", in raised letters or the equivalent instructions, shall appear on the door.

5. For systems using break-glass or break-rod type stations, at least one extra glass pane or glass rod for each station in the system shall be kept in the building. Break glass stations shall have the glass rod or pane mounted on the surface of the station covers or, mounted internally in such a manner that the glass must be broken to actuate the sending station. Suitable hammers on chains attached to the stations, or other approved means for breaking the glass, shall be provided. Stations accomplishing the "break glass" principle using other approved means shall not be required to provide hammers or spare glass.

6. Non-Coded Stations

a. Non-Coded closed circuit fire signal stations shall be operated by a break-glass or break-rod or pull lever device so arranged that the signal cannot be interfered with except by resetting or replacement of the glass or rod by an authorized person.

b. The construction and materials shall be equivalent to that of the standard approved type coded closed circuit station described in Reference Standard RS 17-3, except that the contacts shall be of sufficient capacity to safely carry the entire operating current of the signal circuit without excessive heating.

7. Stations Testing Devices. Provisions shall be made for a silent test of sending station mechanisms without operating the signalling devices. Such test device shall be designed to prevent any person, except those in authority, from operating the test device and to prevent the possibility of the box being left inoperative after the test.

8. Provisions shall be made to supply an audible as well as visual signal at the fire signal control station from the fire signal station.

Reference Standard 17

G. EVACUATION SOUNDING DEVICES

1. Approved single stroke gongs or dedicated loud speakers shall be provided as the sounding devices. Approved loud speakers shall have heat resistant driven elements and shall conform to Reference Standard RS-17-5. When recessed loud speakers are used, they shall conform to the performance requirements of Reference Standard RS-17-5. The loud speakers, when mounted on walls, shall be mounted upon interior walls in preference to building core walls.

2. Recessed loud speakers, if used, shall be located not more than ten feet from the entrance to each required exit to insure proper evacuation signal reproduction. This spacing is based upon normal eight feet to ten feet ceiling height. Surface mounted loud speakers shall be mounted within ten feet of each egress to insure proper evacuation signal reproduction. For unusual conditions and higher ceilings, the loud speakers shall not be mounted more than twenty feet above the floor.

3. For new fire protective signal systems only, in the entire building when at least twenty-five (25%) percent of the occupants have hearing impairments and in those areas where the ambient noise level exceeds ninety decibels (90 dBA) on the "A" scale, provided in all applicable areas at least one visual evacuation signal. This signal shall be a xenon lamp flasher having a minimum flash intensity of one million candlepower, dissipating for each lamp flash a minimum energy of fifteen joules, and shall be wall mounted at a minimum height of nine feet above the floor. The lamp flasher shall be totally enclosed so that all visible and ultraviolet radiations at or below its center line shall be blocked and so that all visible upward radiation, shall be transmitted. The visual evacuation signal shall flash once every three seconds, repeated twelve times.

4. The evacuation sounding devices may be utilized for other audible purposes, including building security, when means is provided to insure fire evacuation signal priority.

H. FIRE SIGNAL SYSTEM CONTROL STATION

1. Supervising Circuits

a. Class "G" fire protective signal systems shall be supervised, except for the alphanumeric annunciator.

b. The supervising circuit shall be provided with a trouble signal arranged to sound continuously in case of failure of the primary power source or other derangements. The trouble signal shall be so located that it will be within audible range of a responsible person in the building.

c. Trouble signals may be fitted with silencing switches only when the switch is connected in such a manner that the act of silencing the signal by the operation of the switch will automatically transfer the trouble signal to a red lamp on the fire signal control station. When the trouble has been repaired, the alarm signal shall sound until the silencing switch has been reset to operate under normal conditions.

d. The trouble signal shall give a distinctive tone.

2. Protection of Sending and Sounding Devices. In fire protective signal systems, the sending stations and sounding devices shall be enclosed in metal casings, made dust proof and damp proof when necessary, and shall be clearly marked with instructions for use.

3. Standards of Electrical Signal Apparatus. All electricity actuated apparatus used in fire protective signal systems shall be so designed and constructed that it will operate satisfactorily at an input voltage level of twenty (20%) percent below or ten (10%) percent above the normal rated voltage.

4. Insulation

a. Insulating materials used shall be varnished cambric, bakelite, mica or other equivalent insulating material.

b. The use of fiber or paper as an insulating material is prohibited.

c. The insulating materials used shall be capable of withstanding an insulation breakdown test of one thousand volts ac., plus twice the operating voltage applied for one minute.

5. Electromagnets

a. Electromagnetic windings shall be impregnated with an insulating and moisture repelling compound of the silicone or epoxy type.

b. Electromagnetic coils used on alternating current, when composed of enameled wire, shall have additional approved insulation on each wire. The coils may be of the form wound type.

c. A protective cover to prevent mechanical damage shall be provided over the entire coil.

d. Electromagnetic coils shall be fastened to prevent floating.

e. Electromagnetic cores shall be of the best grade of ferrous material so as to reduce to a minimum the possibility of failure due to residual magnetism.

f. Electromagnetic cores for use on alternating current shall be of laminated construction or other approved method to prevent heating and to promote efficiency.

g. Electromagnetic cores of relays shall be treated to prevent corrosion. Paint or varnish shall not be used for this purpose.

h. Nonmagnetic freeze pins shall be used to prevent two magnetic surfaces from making physical contact with each other.

6. Wiring

a. All connections shall be secure and properly protected and, where subject to motion, shall be of approved flexible wire. All wiring of the fire signal control station, the fire station circuits and the supervisory circuits, shall be approved.

b. Binding posts, when used, shall be of such design that the wire is held between two flat surfaces. Binding posts shall be mounted on an approved terminal block or insulating strip. The spaces between the binding posts shall be at least one half inch, unless they are separated by approved barriers.

Reference Standard 17

c. Digital electronic printed circuit cards, when used, shall be one sixteenth inch thick glass fiber epoxy resin. The cards shall have color coded ejectors used to group cards according to function so that they may be located quickly and shall have plated through holes as feed through on all logic cards. The connection fingers shall be gold, plated over nickel.

7. Overload Protective Devices. The digital electronic circuits shall provide protection of all equipment and circuits by opening up the circuit to the equipment or devices protected. The operation of this overload circuit shall cause the trouble signal to sound at the fire signal control station.

8. The control boards shall operate so that trouble in an individual zone may be shunted out without affecting the operation of the rest of the zones of the system.

9. Provision shall be made for sufficient wire gutter space around the panel. The gutter space shall be a minimum of two inches at the sides, the top and the bottom. The wire in the gutter space shall be properly laced in a neat and workmanlike manner on all control boards.

10. Conduit knockouts shall not be provided in the top of the control board cabinet, unless designed and approved for entry on top.

11. A wiring diagram of the fire protective signal system approved by the Fire Commissioner and the approved card of instruction properly marked, shall be provided and securely fastened within the control board cabinet and at the fire signal control station. When it becomes necessary to mount the diagram outside of the cabinet, the diagram shall be framed under glass or an equivalent material.

12. Control Boards

a. The control boards and amplifiers used for voice communication and alarm shall be located in a safe, moisture and dust free location secure from unauthorized tampering. Otherwise a ventilated cabinet provided with a lock and a key suitably identified, shall be provided.

b. The amplifiers for the Class "G" systems shall have the capacity to deliver sufficient power to operate all evacuation sounding devices and the voice communication systems, and have a fifty (50%) percent reserve power capacity. In addition, the amplifiers shall be wired in such a manner that the imminent failure or actual failure of amplifiers shall shut down the amplifiers and shall indicate a trouble condition. The removal of an amplifier shall be indicated by a trouble signal at the fire signal control station. The opening of the control cabinets shall be supervised by a tamper switch producing a manually resetting trouble alarm at the fire signal control station.

13. Fire Control Station. The Station shall consist of the following equipment:

a. Time delay means in accordance with Section II A. above. At the end of the time delay or, at the time of the by pass, the interior evacuation signal shall sound and all interconnected controls shall operate.

b. Alphanumeric annunciation in accordance with Section II B. above.

c. A key controlled signal cancellation in accordance with Section II C. above.

d. A by-pass means in accordance with Section II D. above.

e. A printer which records system events in accordance with the Equipment Requirements of this standard, located in the Building Engineer's office.

f. Five day week digital electronic clocks to revert the pre-signal operation to normal (zero time delay) operation after normal building hours, and permitting immediate evacuation sounding after signal initiation determined by matching two successive code rounds.

I. PAINTING OF EQUIPMENT

All enclosing cases for fire signal, sprinkler alarm detection and associated systems alarm apparatus shall be painted Fire Department "red", except where approval is given by the Commissioner to deviate from this requirement.

J. INFORMATION DISPLAY SYSTEMS

1. The indicating devices shall describe the purposes they serve. The printed designation on unit or building information display systems indicators shall be legible. All conditions indicated shall remain displayed in accordance with the Equipment Requirements of this standard.

2. A unit information display system shall be so designed that the operation of any station in the unit shall cause a visible and audible signal.

3. Trouble displays shall be so arranged that the indicating device will reset automatically when the cause of the trouble has been removed. The trouble information display system shall be so designed that it will indicate visible and audible trouble signals in the event of trouble occurring on any circuit monitored. The trouble information display system shall be actuated by the operation of supervisory devices.

4. There shall be a silencing means for trouble signals that shall not affect subsequent trouble signals.

5. The information display systems shall be so designed that vibration from without or that caused by a trouble signal within will not operate the indicating devices.

6. All remote information display systems shall be installed in a separate steel cabinet painted Fire Department "red" and provided with approved lock and key. The information display system cabinets shall be marked in white letters at least one inch high with the words: "Fire Signal Information Display System, Zone . . .", or "Fire Signal Trouble Information Display System", whichever the case may be.

7. The information display systems shall be wall mounted and shall have the legend "Fire" in red letters three inches high together with an audible signal, in

Reference Standard 17

addition to the alphanumeric annunciation, and a separate and distinctive trouble signal shall sound. The audible signal accompanying an alarm shall be silenced when the equipment is operated by the Chief Building Administrator or his delegated substitute.

8. The display shall provide a minimum of four simultaneous alarm indications with an overflow memory for additional alarms. Provisions shall be made to distinguish alarm conditions from non alarm conditions. The display shall be updated as new information becomes available. If the same condition exists for more than one point on a floor or, for more than one floor in a building, a separate output entry shall be displayed for each point on the floor or floors.

9. Display Format. Each output entry shall include self identifying memory codes for the type of signal, building or area designation, floor or stair number and point location, and time of day.

10. Maintainability.

a. Manual display of all points of annunciation for test purposes shall be provided.

b. The capability shall be provided for interrogation of any station or sensing element for test purposes, either at the remote device or by interrogation from the office control location. Intervals for testing shall be as approved by the Fire Commissioner.

c. The equipment design shall be modular so that all repairs may be performed at the building site by substitution of duplicate components by authorized repair personnel.

d. On each one of those parts that are of a modular nature shall be included as spares at the control station.

K. LICENSED CONTRACTORS

Only a person holding a license or a special license in accordance with the provisions of the New York City Electrical Code shall install or alter the electrical wiring or apparatus for fire protective signal systems in any building.

L. USED OR REBUILT APPARATUS

Used apparatus shall not be re-used for any interior fire signal system until this used apparatus has been reconditioned in the shop of an approved manufacturer of interior fire alarm apparatus. Approval shall be obtained from the Commissioner prior to installation. The use of reconditioned apparatus whose manufacturer has discontinued manufacturing equipment is prohibited.

****DOB 4-13-03; DOB 1-9-02**

**** REFERENCE STANDARD RS 17-3A STANDARDS FOR THE INSTALLATION OF CLASS E, CLASS C AND CLASS J FIRE ALARM SIGNAL SYSTEMS**

(Note: References herein to Class E Systems shall be deemed to also include references to Class C and Class J Systems.)

1. (A) SOURCES OF ELECTRICAL POWER

Two sources of electrical power shall be provided as follows:

(1) The primary source shall be generated electric power not exceeding 277/480 volts, supplied by utility company power, or isolated plant.

(2) The secondary source shall be an emergency power system (as per 27-396), emergency generator and/or battery power.

One source of power shall be connected to the system at all times. The primary and secondary power sources shall be so arranged and controlled by automatic transfer switches and/or circuitry that when the primary source of power fails, the secondary source will be connected automatically to the fire alarm signal system. Intermediary devices between the system supply and the source of power, other than fused disconnect switches, transformers, fused cutouts and automatic transfer switches, are prohibited. Such disconnect switches, cutouts, transformers and automatic transfer switches shall supply only the fire alarm system and other Systems covered by this reference standard. When the utility company requires the installation of metering current transformers, the system supply shall be connected on the load side of the current transformers. All installations shall comply with the applicable sections of the New York City Electrical Code.

The primary source of power and the secondary source (if emergency power system or generator) shall each be provided with a means of disconnect from the fire alarm system. For buildings supplied at 120/208 volts, each disconnect shall consist of a fused cutout panel, utilizing cartridge fuses, with provision for interrupting the unfused neutral and all ungrounded conductors. The neutral shall be provided with a removable solid copper bar. The incoming service neutral shall be bonded to the metallic housing of the cutout panel on the line side of the removable bar. The fused cutout panel housing shall consist of a locked metallic cabinet with a hinged door, painted fire department red, and permanently identified as to the system served. For buildings served at 265/460 volts, the primary and secondary service disconnects shall be fused disconnect switches (in lieu of fused cutout panels) in locked, red painted, permanently identified enclosures. The service voltage shall be transformed to 120/208 volts and a fused cutout panel provided within 5 feet of the transformer on the 120/208 volt side. The incoming supply connections shall comply with the NYC Electrical Code, and the fused cutout panel shall comply with the requirements specified hereinbefore.

(B) PRIMARY POWER SOURCE

1. The primary service to the fire alarm system shall be so arranged that the building source of supply can be disconnected without de-energizing the fire alarm supply. To accomplish this, the primary fire alarm supply shall be connected ahead of all building over current protection and/or switching devices.

2. Partial systems such as strobe light control panels, fire alarm, automatic smoke/heat detection, and sprinkler

Reference Standard 17

alarm subsystems and/or other associated systems may be connected to an emergency supply riser panel via a tapped connection, and identified, locked fused cutout box located within 5 feet of the tap.

Where an emergency power system is provided in accordance with section 27-396.4, it shall be connected to the emergency supply riser. Where an E.P.S. is not available, the emergency supply riser shall be connected to a tap ahead of the service switch.

(C) SECONDARY POWER SOURCE

The secondary service to the fire alarm system shall be provided as follows:

1. If the building has a required emergency power system, the secondary source shall be the emergency power system, regardless of whether the primary source is utility company power or an isolated plant.
2. If the building has an emergency generator supplying power to any of the loads listed in 27-396.4, the secondary source shall be the generator.
3. For all other buildings, the secondary source shall be a battery supply provided in accordance with Reference Standard 17-5 for storage batteries. The battery shall be designed for 24-hour supervisory operation of the system, followed by:
 - a. 6 hour total system load for systems with voice communication capability (A 45 minute period of voice/alarm operation at maximum connected load shall be considered equivalent to 6 hours of total systems operation), or
 - b. 15 minutes of total system load for systems without voice capability.
4. Partial systems and/or associated systems may derive their secondary supply from batteries whether or not the building is equipped with an emergency generator. Batteries shall be designed for 24-hour supervisory operation followed by 5 minutes of total system load. All alterations to any existing approved fire alarm system involving or consisting of the replacement of the Fire Command Station, Fire Alarm Control Panel, Central Processing Unit, Floor Control Units, Remote Control Units, Data Gathering Panels, Terminal Transmission Board, and other similar or equivalent controls or control panels shall be required to comply with Section C3 above. For systems in buildings, which are in compliance with Sections (C)1 or(C)2 above, compliance with Section (C)3 is optional.

2. Associated Systems. –

Associated systems listed below shall have their actuation added to the Fire Command Station.

- (a) Smoke detection systems.
- (b) Sprinkler waterflow alarms.
- (c) Thermostatic alarms.
- (d) Locked door-fail safe release systems.
- (e) Elevator communication and interconnection.
- (f) Stair pressurization fan(s) and associated damper(s)

3. Wiring. -

- a. Power Conductors (Above 75 volts) shall be:
 - (1) Copper: THHN, THWN/THHN, TFFN, TFN, FEP, RHH, RHW-2, XHH, or XHHW; minimum 600 volts; 90 C; for installation in rigid metallic conduit (RMC), intermediate metallic conduit (IMC) or electric metallic tubing (EMT).
 - (2) Cable type MI, M.E.A. approved for fire alarm service.
- b. Low Voltage Conductors (75 volts and less)
 - (1) Copper; THHN, THWN/THHN, TFFN, TFN, FEP, RHH, RHW-2, XHH, XHHW, minimum 600 volts; 90 C; for installation in rigid metallic conduit (RMC), intermediate metallic conduit (IMC), electric metallic tubing (EMT)
 - (2) Minimum wire size No. 18 AWG.
 - (3) Multi-conductor cables run in raceways, or exposed as described hereinafter, shall meet the following additional requirements:
 - a. Type FPLP only; minimum insulation thickness 15 mils; minimum temperature 150C; colored red.
 - b. Red colored jacket overall; minimum thickness 25 mils.
 - c. Cable printing as per UL1424; must bear additional description "ALSO CLASSIFIED NYC CERT. FIRE ALARM CABLE," legible without removing jacket.
 - c. Installation of Conductors and Raceway shall be in accordance with the following:
 - (1) Power conductors shall not be installed in common raceways with low voltage conductors.
 - (2) Shall comply with applicable requirements of New York City Electrical Code, except where requirements are exceeded by this Reference Standard.
 - (3) Conductors other than M.I. cable shall be run in raceway, except as specifically described below.
 - (4) Multi-conductor cables may be installed without raceway protection where cable is protected by building construction. Where not protected by building construction, cables shall be located 8 feet or more above the finished floor and not subject to physical tampering or hazard. Locations within eight feet of the finished floor that are deemed as "protected by building construction" shall include raised floors, shafts, telephone and communication equipment rooms and closets, and rooms used exclusively for fire alarm system equipment. In any suppression and extinguishing system activated by automatic fire detection, including, but not limited to, pre-action sprinkler, deluge sprinkler, clean air agent, halon, range hood, CO2 and dry chemical, multi-conductor cables shall be installed in RMC, IMC, or EMT.
 - (5) All wiring within mechanical and elevator equipment rooms shall be run in raceway.
 - (6) Where wiring is required to be run in raceway, install conductors in rigid metallic conduit (RMC), intermediate metallic conduit (IMC) or electric metallic tubing (EMT); except that multi-conductor cables may also be run in surface metal raceway. Flexible metallic conduit, not exceeding 36" in length, shall be permitted

Reference Standard 17

for final connections to initiating and notification devices. Conductors for other electrical systems shall not be installed in raceways containing REFERENCE STANDARD 17 conductors.

(7) Where allowed to be run without raceway protection, multi-conductor cables shall be installed as follows:

a. Cables shall not depend on ceiling media, pipes, ducts, conduits, or equipment for support. Support independently from the building structure.

b. Secure by cable ties, straps or similar fittings, so designed and installed as not to damage the cable. Secure in place at intervals not exceeding 5'0" on centers and within 12" of every associated cabinet, box or fitting.

(8) Raceways run within 8 feet of finished floor in garage areas, loading docks, mechanical rooms, and elsewhere where subject to mechanical damage, shall be rigid galvanized steel conduit only.

(9) Installation of raceways, boxes and cabinets shall comply with the following general requirements.

a. Covers of boxes and cabinets shall be painted red and permanently identified as to their use.

b. Penetrations of fire-rated walls, floors or ceilings shall be fire stopped.

c. Within stairways, raceways within 8 feet of the floor shall not be installed so as to reduce or obstruct the stairway radius.

d. Raceways or cables shall not penetrate top of any equipment box or cabinet.

(10) All conduits supplying 120-volt power to the fire command station and/or fire alarm control unit and/or to outlying control cabinets, shall contain a green insulated grounding conductor sized in accordance with the New York City Electrical Code (#10 AWG minimum). The grounding conductor shall be connected to the ground bus or other suitable grounding terminal in each box and cabinet in which it enters. At the fuse cutout panel supplying the fire alarm system, provide a grounding electrode conductor sized and installed in accordance with the New York City Electrical Code (#10 AWG minimum).

(11) For cabinets whose 120-volt supply is not derived from the main fire alarm system cutout panel, provide green insulated separate grounding electrode conductors, sized and installed as per New York City Electrical Code (#10 AWG minimum). In steel, framed buildings, a connection to local steel structure will be acceptable.

(12) Splices and terminations of wires and cables shall be as follows:

a. Permitted only in boxes or cabinets specifically approved for the purpose.

b. Utilize mechanical connections specifically approved by U.L. 486 A & C for the conductors, or if soldered, first joined so as to be mechanically and electrically secure prior to soldering and insulating. Temperature

rating of completed splices shall equal or exceed the temperature rating of the highest rated conductor.

(13) Wiring for audible and visual alarm notification devices shall be arranged so that a loss of a portion of the wiring on a floor will not render more than 60% of the devices of each type inoperative, and the devices shall be so connected to the circuitry (i.e., by means of alternate circuits) as to maintain at least partial audibility/visibility throughout the entire floor.

4. Fire Alarm Sending Stations, Class "E" - Non-Coded Manual Station, and Floor Warden Station. -

(a) There shall be at least one (1) fire alarm sending station in each story of a building located in each path of escape. Additional stations shall be installed so that no point on any floor shall be more than 200 feet from the nearest station.

(b) A floor warden station on each floor shall be located between required stairways, required vertical exits or other required exits. All types of systems shall include a telephone type handset at the floor warden station with integral signaling to the fire command station and may be a part of the speaker system. The handset shall be red and equipped with armor over the wiring between the hand set and its housing which may be installed flush, semi-flush or surface mounted. The housing shall be painted red and identify its function. Equipment shall be installed with a box recessed or surface mounted large enough to include the hand set and test facility, by means of a key, to test the floor automatic and manual alarm device wiring. A pilot light shall indicate the live condition of the floor warden station.

Doors of sending stations shall be painted red and lettered "FIRE EMERGENCY - OPEN DOOR TO OPERATE" or words to this effect. Instructions for operating the station shall be permanently affixed or be an integral part of the station. Instruction cards shall be provided at each station protected by glass or plastic. Designation number of station shall be prominently displayed on instruction card or on cover of station.

(c) All current-carrying parts shall be insulated from parts carrying current of opposite polarity with approved insulating material.

(d) All pull-lever type stations shall be constructed with a door or other approved means to protect the "pull lever" against accidental injury. The wording "IN CASE OF FIRE - OPEN DOOR AND PULL DOWN LEVER" in raised letters or equivalent instructions, shall appear on the door.

(e) For systems using break-glass or break-rod type stations, at least one extra glass rod or glass pane for each station in the system shall be kept in the building. Break glass stations shall have the glass rod or pane mounted on the surface of the station covers or mounted internally in such a manner that the glass must be broken to actuate the sending station. Suitable hammers

Reference Standard 17

on chains attached to the stations or other approved means of breaking the glass, shall be provided. Stations accomplishing the "break glass" principle using other approved means shall not be required to provide hammers or spare glasses.

(f) Non Coded Stations:

(1) Non-coded closed circuit fire alarm stations may be operated by a break-glass or break-rod or a pull lever device so arranged that the alarm cannot be interfered with except by resetting or replacement of the glass or rod by an authorized person.

(2) The construction and materials shall be equivalent to that of the standard approved type coded closed circuit station described in reference standard RS 17-3 except that the contacts shall be of sufficient capacity to safely carry the entire operating current of the alarm circuit without excessive heating.

(g) Station Testing Devices - Provisions shall be made for a silent test of sending station mechanisms without operating the signaling devices. Such test device shall be designed to prevent any person, except those in authority, from operating the same and to prevent the possibility of the box being left inoperative after the test.

(h) Provision shall be made to supply an audible and visual signal at the fire command station from the floor warden station.

(i) A designated station on each floor shall have the capability of operating the loud speakers for that floor.

5. Alarm Sounding Devices. -

(a) Approved speakers shall be provided as the sounding devices. The alarm sound shall be a generated gong, bell, horn, whistle or other acceptable signal. Chime sounds may be installed only with the approval of the commissioner. Approved speakers shall have heat resistant driven elements and shall conform to reference standard RS 17-5.

When recessed speakers are used they shall conform to the performance requirements of reference standard RS 17-5. Speakers when mounted on walls shall be mounted upon tenant walls in preference to building core walls.

(b) Recessed speakers if used shall be located not more than 10 feet from the entrance to each required exit to insure proper alarm signal reproduction. This spacing is based upon normal 8 feet - 10 feet ceiling height. Surface mounted type speakers shall be mounted within 10 feet of each egress to insure proper alarm signal reproduction. For unusual conditions and higher ceilings, speakers shall not be mounted more than 20 feet above floor.

(c) The alarm sounding devices may be utilized for other audio purposes including building security if means is provided to insure fire alarm priority.

6. Fire Alarm System Control Boards and Command Stations. -

(a) Supervising Circuit. -

(1) Class "E" fire alarm systems shall be supervised.

(2) The supervising circuit shall be provided with a trouble signal arranged to sound continuously in case of failure of the primary power source. The trouble signal shall be so located that it will be within audible range of a responsible person in the building.

(3) Trouble signals may be fitted with silencing switches only when the switch is connected in such a manner that the act of silencing the signal by the operation of the switch automatically transfers the trouble signal to a red lamp on the fire command station. When the trouble has been repaired, the alarm signal shall sound until the silencing switch has been reset to operate under normal conditions.

(4) The trouble signal shall give a distinctive signal.

(b) Protection of Sending and Sounding Devices. -In fire alarm signal systems, sending stations and sounding devices shall be enclosed in metal casings, made dust proof and damp proof when necessary, and clearly marked with instructions for use.

(c) Standards of Electric Alarm Apparatus. -All electrically actuated apparatus used in fire alarm systems shall be so designed and constructed that it will operate satisfactorily at an input voltage level 15 per cent below or 10 per cent above normal rated voltage.

(d) Insulation. -

(1) Insulating materials used shall be varnished cambric, bakelite, mica, or equivalent insulating material.

(2) The use of fiber or paper as an insulating material is prohibited.

(3) The insulating materials used shall be capable of withstanding an insulation breakdown test of 1,000 volts a.c. plus twice operating voltage applied for 1 minute.

(e) Electromagnets. -

(1) Electromagnet windings shall be impregnated with an insulating, moisture repelling compound of the silicone or epoxy type.

(2) Electromagnet coils used on alternating current, when composed of enameled wire shall have additional approved insulation on each wire. The coils may be of the form-wound type.

(3) A protective cover to prevent mechanical damage shall be provided over the entire coil.

(4) Electromagnetic coils shall be fastened to prevent floating.

(5) Electromagnet cores shall be of the best grade of ferrous material so as to reduce to a minimum the possibility of failure due to residual magnetism.

(6) Electromagnet cores for use on alternating current shall be of laminated construction or other approved method to prevent heating and promote efficiency.

Reference Standard 17

(7) Electromagnetic cores of relays shall be treated to prevent corrosion. Paint or varnish shall not be used for this purpose.

(8) Non-magnetic freeze pins shall be used to prevent two magnetic surfaces from making physical contact with each other.

(f) Relays. -

(1) The armatures of all relays shall depend on gravity or magnetic attraction for their operation and may be assisted by a spring.

(2) Adjustments shall be of such a character that they can be securely locked.

(g) Overload protective devices. -Electronic circuits shall provide protection of all equipment and circuits by opening up the circuit to the equipment or devices protected. The operation of this "overload circuit" shall cause the trouble signal to sound at the fire command station.

(h) Control boards shall operate so that troubles in individual zones may be shunted out without affecting the rest of the system.

(i) Provision shall be made for sufficient wire gutter space around the panel. Gutter space shall be a minimum of 2 inches at sides, top, and bottom. Wire in gutter space shall be properly laced in a neat and workmanlike manner on all control boards.

(j) Conduit knockouts shall not be provided in the top of the control board cabinet, unless designed and approved for entry on top.

(k) A wiring diagram of the alarm system approved by the commissioner and the approved card of instruction properly marked and securely fastened shall be provided within the control board cabinet and at the fire command station. When it becomes necessary to mount the diagram outside of the cabinet, the diagram shall be framed under glass or equivalent material.

(l) Control Boards. -

(1) Control boards and amplifiers used for voice communication and alarms shall be located in a safe, moisture and dust free location secure from unauthorized tampering. Otherwise a ventilated cabinet provided with a lock and key, suitably identified, shall be provided.

(2) Amplifiers for class E systems shall have the capacity to deliver sufficient power to operate all alarm sounding devices and voice communication system and have a 50 per cent reserve power capacity. In addition the amplifiers shall be wired in such a manner that the imminent failure or actual failure of amplifiers shall shut down the amplifier and indicate a trouble condition. Removal of an amplifier shall be indicated by a trouble signal at the fire command station. Opening of the control cabinets shall be supervised by a tamper switch producing a manually resettable trouble alarm at the fire command station.

(m) Fire Command Station . -The fire command station shall contain all the components described in the

building code and shall have the capability of overriding floor warden stations. The command station console shall be provided with a hinged cover which permits the flashing "FIRE" visible signal to be seen. The cover shall be provided with an approved lock and key. The fire command station shall be provided with an information display system so located as to provide minimum distortion due to an angular line-of-sight and ambient lighting conditions. This display shall have the capability to monitor the following systems in order of listed priority:

- (1) Manual Fire Alarm
- (2) Smoke Detection
- (3) Sprinkler Waterflow
- (4) Elevator Lobby Detector
- (5) Fire Signal Activation
- (6) Central Office Notification
- (7) Fan System on - Fan System off
- (8) Fail Safe Locked Door
- (9) Fire Systems Trouble
- (10) Fire Signal Trouble
- (11) Tamper Switch Alarm
- (12) Power Source
- (13) Test/Normal Mode
- (14) Other Information as Desired
- (15) Stair pressurization fan(s) and associated damper(s).

7. Painting of Equipment. -All enclosing cases for fire alarm sprinkler alarm, smoke detection, and associated systems alarm apparatus shall be painted fire department red, except where approval is given by the commissioner to deviate from this requirement. The lobby information display system may be painted or finished to suit the owner of the building.

8. Information Display Systems. -

*(a) Information display systems used in connection with Class E Fire Alarm Signal Systems shall be of an approved electrically supervised type. The indicating devices shall describe the purpose they serve. The printed designation on unit or building information display system indicators shall be legible. The mechanism shall be so arranged that once operated, the indicating device must be reset manually. All conditions indicated shall remain displayed until manually cleared at the Fire Command Station. Fire Command Stations shall provide alarm information in a direct manner; no references to numeric codes shall be permitted. Where a CRT display is provided, a specially marked control shall be provided that will enable the system operator to determine the alarm source and other related pertinent information.

**Local Law 16-1984*

(b) A unit information display system shall be so designed that the operation of any station in the unit causes a visible and audible signal.

(c) Trouble displays shall be so arranged that the indicating device will reset automatically when the

Reference Standard 17

cause of trouble has been removed. The trouble information display system shall be so designed that it will indicate visible and audible trouble signals in the event of trouble occurring on any circuit monitored. The trouble information display system shall be actuated by the operation of supervisory devices.

(d) A silencing switch shall be provided for trouble signals, but shall not affect subsequent trouble signals.

(e) Information display systems shall be so designed that vibration from without or that caused by a trouble signal within will not operate the indicating devices.

(f) All remote information display systems shall be installed in a separate steel cabinet painted red, provided with approval lock and key. Information display system cabinets shall be marked in white letters at least one inch high with the words "FIRE ALARM INFORMATION DISPLAY SYSTEM, ZONE ----- " or "FIRE ALARM TROUBLE INFORMATION DISPLAY SYSTEM", whichever the case may be.

(g) Information display systems located in the lobby of a building whether an integral part of the fire command station or wall mounted shall have the legend "FIRE" in red letters three inches high together with an audible signal in addition to the lamp, target drop, cathode ray tube, light emitting diode, nixie, etc. and a separate or distinctive trouble signal shall sound. The audible signal accompanying an alarm shall be automatically silenced when the fire command station is operated by the fire safety director or his delegated substitute. Remote information display systems shall operate in the same manner.

(h) The display shall provide a minimum of four simultaneous alarm indicators with an overflow indication for additional alarms. Provisions shall be made to distinguish alarm conditions from non-alarm conditions. The display shall be updated as new information becomes available. If the same condition exists for more than one point on a floor or for more than one floor in a building, such as a fire gong actuation or public address, a separate output entry shall be displayed for each point or floor.

(i) Display format. - Each output entry shall include self-identifying mnemonic codes for the type of signal, building or area designation, floor or stair number and point location, and time of day. Systems utilizing gravity drops or lamps as point identification, may provide a hard copy print out.

(j) Maintainability. -

(1) Manual display of all points of annunciation for test purposes shall be provided.

(2) Capability shall be provided for interrogating any station or sensing element for test purposes, either at the remote device or by interrogation from the fire command station. Intervals of testing shall be as approved.

(3) Equipment designed shall be modular so that all repairs may be performed on-site by substitution of duplicate components by authorized personnel.

(4) One each of these parts that are of a modular nature shall be included as spares at the fire command station.

9. Licensed Contractors. -Only a person holding a license or a special license in accordance with the provisions of the New York city electrical code, shall install, alter, or repair electrical wiring or apparatus for fire alarm systems in any building.

10. Used or Rebuilt Apparatus. -Used apparatus shall not be re-used for any interior fire alarm system until the same has been reconditioned in the shop of any approved manufacturer of interior fire alarm apparatus. Approval shall be obtained from the commissioner prior to installation. The use of reconditioned apparatus whose manufacturer has discontinued manufacturing equipment is prohibited.

11. Standpipe Fireline Telephone and Signal System. - Where the standpipe telephone and signal system is arranged to be used as a modified class E fire alarm signal system as provided in the building code, retractable telephone handsets shall be provided in pump rooms. The telephone in pump rooms shall be equipped with a loudspeaking receiver so that a voice can be distinctly heard at least 15 feet from the receiver.

12. Locked Door Fail Safe Systems. -

(a) Stairway reentry doors which are locked from the stairway side as permitted in section C26-604.4 of the administrative code shall be provided with an electrical fail safe strike release mechanism that will permit the door to be opened without a key when any automatic fire detecting device operates, elevator "Fireman Service" operates or power failure shall occur. In addition, provisions shall be made to permit these doors to be opened from the command station or mechanical control center. This system shall be manually reset.

(b) Wiring for these systems shall comply with rule 6(a), (b), (c) and (d) of this reference standard and be electrically supervised for open and shorted or grounded circuits.

(c) Transformers for release mechanisms shall be rated for the proper use load, identified and located in proximity of the power supply for other fire alarm systems.

(d) The release mechanisms shall be operated from a separate control relay having the capability of indicating trouble on a separate trouble signal and at the information display system on the command console and at the mechanical control center. The mechanism shall also indicate a "failed" and "open" status on the command console and at the mechanical control center.

*(e) Where a fail-safe reentry door has been converted to conform to the requirements of this code by means of an electric strike release, provision shall be made to

Reference Standard 17

insure that the door will remain "Latched" even if "Unlocked".

**Local Law 16-1984*

13. Radio System. -A radio or radio/wire system shall comply with the following requirements:

(a) The emergency notification portion of the system equipment shall be capable of the following:

(1) Have the capability of individual, group or entire building notification of an alarm tone and voice intelligibility.

(2) Receivers and wire extension speakers shall be permanently mounted to a wall or pillar.

(3) There shall be automatic switch over to emergency battery power supply.

(b) Two way communication shall be accomplished by fixed transmitters and receivers.

(c) Equipment shall be Federal Communications Commission (FCC) approved, FM type, solid state, above 150.8 MHz. Selective signaling shall be accomplished by a minimum of 2 tone code operation.

(d) The antenna shall be designed and installed for use at the fire command station transmitter and be capable of transmitting to all fixed stations.

(e) The fire command station unit shall have the capability of locking out all other remote control points.

14. Sprinkler Waterflow Alarms. -A sprinkler waterflow alarm may be arranged to be used as part of a modified class E fire alarm signal system provided: the alarm signal system shall be an approved electrically supervised closed circuit information display system capable of indicating the floor where the sprinkler was activated.

15. Elevator communication:

Elevator intercommunication shall be acceptable for communications with the Fire Command Station if there is a means of communication proximate to the Fire Command Station.

***DOB 4-13-03; Local Law 16-1987; Local Law 16-1984; Local Law-5-1973*

**** REFERENCE STANDARD RS 17-3B STANDARDS FOR THE INSTALLATION OF MODIFIED CLASS E, AND MODIFIED CLASS J FIRE ALARM SIGNAL SYSTEMS**

(Note: References herein shall be deemed to also include references to Modified Class J Systems.)

1. (A) SOURCES OF ELECTRICAL POWER

Two sources of electrical power shall be provided as follows:

(1) The primary source shall be generated electric power not exceeding 277/480 volts, supplied by utility company power, or isolated plant.

(2) The secondary source shall be an emergency power system (as per 27-396), emergency generator and/or battery power.

One source of power shall be connected to the system at all times. The primary and secondary power sources shall be so arranged and controlled by automatic transfer switches and/or circuitry that when the primary source of power fails, the secondary source will be connected automatically to the fire alarm signal system. Intermediary devices between the system supply and the source of power, other than fused disconnect switches, transformers, fused cutouts and automatic transfer switches, are prohibited. Such disconnect switches, cutouts, transformers and automatic transfer switches shall supply only the fire alarm system and other Systems covered by this reference standard. When the utility company requires the installation of metering current transformers, the system supply shall be connected on the load side of the current transformers. All installations shall comply with the applicable sections of the New York City Electrical Code.

The primary source of power and the secondary source (if emergency power system or generator) shall each be provided with a means of disconnect from the fire alarm system. For buildings supplied at 120/208 volts, each disconnect shall consist of a fused cutout panel, utilizing cartridge fuses, with provision for interrupting the unfused neutral and all ungrounded conductors. The neutral shall be provided with a removable solid copper bar. The incoming service neutral shall be bonded to the metallic housing of the cutout panel on the line side of the removable bar. The fused cutout panel housing shall consist of a locked metallic cabinet with a hinged door, painted fire department red, and permanently identified as to the system served. For buildings served at 265/460 volts, the primary and secondary service disconnects shall be fused disconnect switches (in lieu of fused cutout panels) in locked, red painted, permanently identified enclosures. The service voltage shall be transformed to 120/208 volts and a fused cutout panel provided within 5 feet of the transformer on the 120/208 volt side. The incoming supply connections shall comply with the NYC Electrical Code, and the fused cutout panel shall comply with the requirements specified hereinbefore.

(B) PRIMARY POWER SOURCE

1. The primary service to the fire alarm system shall be so arranged that the building source of supply can be disconnected without de-energizing the fire alarm supply. To accomplish this, the primary fire alarm supply shall be connected ahead of all building over current protection and/or switching devices.

2. Partial systems such as strobe light control panels, partial fire alarm, automatic smoke/heat detection, and sprinkler alarm subsystems and/or other associated systems may be connected to an emergency supply riser panel via a tapped connection, and identified, locked fused cutout box located within 5 feet of the tap.

Reference Standard 17

Where an emergency power system is provided in accordance with section 27-396.4, it shall be connected to the emergency supply riser. Where an E.P.S. is not available, the emergency supply riser shall be connected to a tap ahead of the service switch.

(C) SECONDARY POWER SOURCE

The secondary service to the fire alarm system shall be provided as follows:

1. If the building has a required emergency power system, the secondary source shall be the emergency power system, regardless of whether the primary source is utility company power or an isolated plant.

2. If the building has an emergency generator supplying power to any of the loads listed in 27-396.4, the secondary source shall be the generator.

3. For all other buildings, the secondary source shall be a battery supply provided in accordance with Reference Standard 17-5 for storage batteries. The battery shall be designed for 24-hour supervisory operation of the system, followed by:

a. 6 hour total system load for systems with voice communication capability (A 45 minute period of voice/alarm operation at maximum connected load shall be considered equivalent to 6 hours of total systems operation), or

b. 15 minutes of total system load for systems without voice capability.

4. Partial systems and/or associated systems may derive their secondary supply from batteries whether or not the building is equipped with an emergency generator. Batteries shall be designed for 24-hour supervisory operation followed by 5 minutes of total system load.

All alterations to any existing approved fire alarm system involving or consisting of the replacement of the Fire Command Station, Fire Alarm Control Panel, Central Processing Unit, Floor Control Units, Remote Control Units, Data Gathering Panels, Terminal Transmission Board, and other similar or equivalent controls or control panels shall be required to comply with Section C3 above. For systems in buildings, which are in compliance with Sections (C)1 or (C)2 above, compliance with Section (C)3 is optional.

2. Associated Systems. –

Associated systems listed below shall have their actuation added to the Fire Command Station.

- (a) Smoke detection systems
- (b) Sprinkler waterflow alarms
- (c) Thermostatic alarms
- (d) Locked door-fail safe release systems
- (e) Elevator communication and interconnection.

3. Wiring. –

a. Power Conductors (Above 75 volts) shall be:

(1) Copper: THHN, THWN/THHN, TFFN, TFN, FEP, RHH, RHW-2, XHH, or XHHW; minimum 600 volts;

90 C; for installation in rigid metallic conduit (RMC), intermediate metallic conduit (IMC) or electric metallic tubing (EMT).

(2) Cable type MI, M.E.A. approved for 2-hour fire resistance rating.

b. Low Voltage Conductors (75 volts and less)

(1) Copper; THHN, THWN/THHN, TFFN, TFN, FEP, RHH, RHW-2, XHH, XHHW, minimum 600 volts; 90 C; for installation in rigid metallic conduit (RMC), intermediate metallic conduit (IMC), electric metallic tubing (EMT), and

(2) Minimum wire size No. 18 AWG.

(3) Multi-conductor cables run in raceways, or exposed as described hereinafter, shall meet the following additional requirements:

a. Type FPLP only; minimum insulation thickness 15 mils; minimum temperature 150C; colored red.

b. Red colored jacket overall; minimum thickness 25 mils.

c. Cable printing as per UL1424; must bear additional description "ALSO CLASSIFIED NYC CERT. FIRE ALARM CABLE," legible without removing jacket.

c. Installation of Conductors and Raceway shall be in accordance with the following:

(1) Power conductors shall not be installed in common raceways with low voltage conductors.

(2) Shall comply with applicable requirements of New York City Electrical Code, except where requirements are exceeded by this Reference Standard.

(3) Conductors other than M.I. cable shall be run in raceway, except as specifically described below.

(4) Multi-conductor cables may be installed without raceway protection where cable is protected by building construction. Where not protected by building construction, cables shall be located 8 feet or more above the finished floor and not subject to physical tampering or hazard. Locations within eight feet of the finished floor that are deemed as "protected by building construction" shall include raised floors, shafts, telephone and communication equipment rooms and closets, and rooms used exclusively for fire alarm system equipment. In any suppression and extinguishing system activated by automatic fire detection, including, but not limited to, pre-action sprinkler, deluge sprinkler, clean air agent, halon, range hood, CO₂ and dry chemical, multi-conductor cables shall be installed in RMC, IMC, or EMT.

(5) All wiring within mechanical and elevator equipment rooms shall be run in raceway.

(6) Raceways run within 8 feet of finished floor in garage areas, loading docks, mechanical rooms, and elsewhere where subject to mechanical damage, shall be rigid galvanized steel conduit only.

(7) Where wiring is required to be run in raceway, install conductors in rigid metallic conduit (RMC), intermediate metallic conduit (IMC) or electric metallic tubing (EMT); except that multi-conductor cables may also be run in surface metal raceway. Flexible metallic

Reference Standard 17

conduit, not exceeding 36" in length, shall be permitted for final connections to initiating and notification devices. Conductors for other electrical systems shall not be installed in raceways containing REFERENCE STANDARD 17 conductors.

(8) Where allowed to be run without raceway protection, multi-conductor cables shall be installed as follows:

a. Cables shall not depend on ceiling media, pipes, ducts, conduits, or equipment for support. Support independently from the building structure.

b. Secure by cable ties, straps or similar fittings, so designed and installed as not to damage the cable. Secure in place at intervals not exceeding 5'0" on centers and within 12" of every associated cabinet, box or fitting.

(9) Installation of raceways, boxes and cabinets shall comply with the following general requirements.

a. Covers of boxes and cabinets shall be painted red and permanently identified as to their use.

b. Penetrations of fire-rated walls, floors or ceilings shall be fire stopped.

c. Within stairways, raceways within 8 feet of the floor shall not be installed so as to reduce or obstruct the stairway radius.

d. Raceways or cables shall not penetrate top of any equipment box or cabinet.

(10) All conduits supplying 120-volt power to the fire command station and/or fire alarm control unit and/or to outlying control cabinets, shall contain a green insulated grounding conductor sized in accordance with the New York City Electrical Code (#10 AWG minimum). The grounding conductor shall be connected to the ground bus or other suitable grounding terminal in each box and cabinet in which it enters. At the fuse cutout panel supplying the fire alarm system, provide a grounding electrode conductor sized and installed in accordance with the New York City Electrical Code (#10 AWG minimum).

(11) For cabinets whose 120-volt supply is not derived from the main fire alarm system cutout panel, provide green insulated separate grounding electrode conductors, sized and installed as per New York City Electrical Code (#10 AWG minimum). In steel, framed buildings, a connection to local steel structure will be acceptable.

(12) Splices and terminations of wires and cables shall be as follows:

a. Permitted only in boxes or cabinets specifically approved for the purpose.

b. Utilize mechanical connections specifically approved by U.L. 486 A & C for the conductors, or if soldered, first joined so as to be mechanically and electrically secure prior to soldering and insulating. Temperature rating of completed splices shall equal or exceed the temperature rating of the highest rated conductor.

(13) Wiring for audible and visual alarm notification devices shall be arranged so that a loss of a portion of the wiring on a floor will not render more than 60% of

the devices of each type inoperative, and the devices shall be so connected to the circuitry (i.e., by means of alternate circuits) as to maintain at least partial audibility/visibility throughout the entire floor.

4. Fire Alarm Sending Stations, Modified Class "E" - Non-Coded Manual Station and Floor Warden Station. -

(a) There shall be at least one (1) fire alarm sending station in each story of a building located in each path of escape. Additional stations shall be installed so that no point on any floor shall be more than 200 feet from the nearest station.

(b) A floor warden station on each floor shall be located between required stairways, required vertical exits or other required exits. All types of systems shall include a telephone type handset at the floor warden station with integral signaling to the fire command station and may be a part of the speaker system. The hand set shall be red and equipped with armor over the wiring between the hand set and its housing which may be installed flush, semi-flush or surface mounted. The housing shall be painted red and identify its function. Equipment shall be installed within a box recessed or surface mounted, large enough to include the hand set and test facility, by means of a key, to test the floor automatic and manual alarm device wiring. A pilot light shall indicate the live condition of the floor warden station.

Doors of sending stations shall be painted red and lettered "FIRE EMERGENCY - OPEN DOOR TO OPERATE" or words to this effect. Instructions for operating the station shall be permanently affixed or be an integral part of the station. Instruction cards shall be provided at each station protected by glass or plastic. Designation number of station shall be prominently displayed on instruction card or on cover of station.

(c) All current-carrying parts shall be insulated from parts carrying current of opposite polarity with approved insulating material.

(d) All pull-lever type stations shall be constructed with a door or other approved means to protect the "pull lever" against accidental injury. The wording "IN CASE OF FIRE - OPEN DOOR AND PULL DOWN LEVER" in raised letters or equivalent instructions, shall appear on the door.

(e) For systems using break-glass or break-rod type stations, at least one extra glass rod or glass pane for each station the system shall be kept in the building. Break glass stations shall have the glass rod or pane mounted on the surface of the station covers or mounted internally in such manner that the glass must be broken to actuate the sending station. Suitable hammers on chains attached to the stations or other approved means of breaking the glass, shall be provided. Stations accomplishing the "break glass" principle using other approved means shall not be required to provide hammers or spare glasses.

(f) Non-coded stations. -

Reference Standard 17

(1) Non-coded closed circuit fire alarm stations may be operated by a break-glass or break-rod or a pull lever device so arranged that the alarm cannot be interfered with except by resetting or replacement of the glass or rod by an authorized person.

(2) The construction and materials shall be equivalent to that of the standard approved type coded closed circuit station described in reference standard RS 17-3 except that the contacts shall be of sufficient capacity to safely carry the entire operating current of the alarm circuit without excessive heating.

(g) Station testing devices. - Provisions shall be made for a silent test of sending station mechanisms without operating the signaling devices. Such test device shall be designed to prevent any person, except those in authority, from operating the same and to prevent the possibility of the box being left inoperative after the test.

(h) Provision shall be made to supply an audible and visual signal at the fire command station from the floor warden station.

5. Alarm Sounding Devices. -

(a) Approved speakers shall be provided as the sounding devices. The alarm sound shall be a generated gong, bell, horn, whistle or other acceptable signal. Chime sounds may be installed only with the approval of the commissioner. Approved speakers shall have heat resistant driven elements and shall conform to reference standard RS 17-5.

When recessed speakers are used they shall conform to the performance requirements of reference standard RS 17-5. Speakers when mounted on walls shall be mounted upon tenant walls in preference to building core walls.

(b) Recessed speakers if used shall be located not more than 10 feet from the entrance to each required exit to insure proper alarm signal reproduction. This spacing is based upon normal 8 feet-10 feet ceiling height. Surface mounted type speakers shall be mounted within 10 feet of each egress to insure proper alarm signal reproduction. For unusual conditions and higher ceilings, speakers shall not be mounted more than 20 feet above floor.

(c) The alarm sounding devices may be utilized for other audio purposes including building security if means is provided to insure fire alarm priority.

6. Fire Alarm System Control Boards and Command Stations. -

(a) Supervising circuit. -

(1) Modified class "E" fire alarm systems shall be supervised.

(2) The supervising circuit shall be provided with a trouble signal arranged to sound continuously in case of failure of the power source. The trouble signal shall be

so located that it will be within audible range of a responsible person in the building.

(3) Trouble signals may be fitted with silencing switches only when the switch is connected in such a manner that the act of silencing the signal by the operation of the switch automatically transfers the trouble signal to a red lamp on the fire command station. When the trouble has been repaired, the alarm signal shall sound until the silencing switch has been reset to operate under normal conditions.

(4) The trouble signal shall give a distinctive signal.

(b) Protection of sending and sounding devices. -In fire alarm signal systems, sending stations and sounding devices shall be enclosed in metal casings, made dust proof and damp proof when necessary, and clearly marked with instructions for use.

(c) Standards of electric alarm apparatus. -All electrically actuated apparatus used in fire alarm systems shall be so designed and constructed that it will operate satisfactorily at an input voltage level 15 per cent below or 10 per cent above normal rated voltage.

(d) Insulation. -

(1) Insulating materials used shall be varnish cambric, bakelite, mica, or equivalent insulating material.

(2) The use of fiber or paper as an insulating material is prohibited.

(3) The insulating materials used shall be capable of withstanding an insulation breakdown test of 1,000 volts a.c. plus twice operating voltage applied for 1 minute.

(e) Electromagnets. -

(1) Electromagnet windings shall be impregnated with an insulating, moisture repelling compound of the silicone or epoxy type.

(2) Electromagnet coils used on alternating current, when composed of enameled wire shall have additional approved insulation on each wire. The coils may be of the form-wound type.

(3) A protective cover to prevent mechanical damage shall be provided over the entire coil.

(4) Electromagnetic coils shall be fastened to prevent floating.

(5) Electromagnet cores shall be of the best grade of ferrous material so as to reduce to a minimum the possibility of failure due to residual magnetism.

(6) Electromagnet cores for use on alternating current shall be of laminated construction or other approved method to prevent heating and promote efficiency.

(7) Electromagnetic cores of relays shall be treated to prevent corrosion. Paint or varnish shall not be used for this purpose.

(8) Non-magnetic freeze pins shall be used to prevent two magnetic surfaces from making physical contact with each other.

(f) Relays. -

Reference Standard 17

(1) The armatures of all relays shall depend on gravity or magnetic attraction for their operation and may be assisted by a spring.

(2) Adjustments shall be of such a character that they can be securely locked.

(g) Overload protective devices. -Electronic circuits shall provide protection of all equipment and circuits by opening up the circuit to the equipment or devices protected. The operation of this "overload circuit" shall cause the trouble signal to sound at the fire command station.

(h) Control boards shall operate so that troubles in individual zones may be shunted out without affecting the rest of the system.

(i) Provision shall be made for sufficient wire gutter space around the panel. Gutter space shall be a minimum of 2 inches at sides, top, and bottom. Wire in gutter space shall be properly laced in a neat and workmanlike manner on all control boards.

(j) Conduit knockouts shall not be provided in the top of the control board cabinet unless designed and approved for entry on top.

(k) A wiring diagram of the alarm system approved by the commissioner and the approved card of instruction properly marked and securely fastened shall be provided within the control board cabinet and at the fire command station. When it becomes necessary to mount the diagram outside of the cabinet, the diagram shall be framed under glass or equivalent material.

(l) Control boards. -

(1) Control boards and amplifiers used for voice communication and alarms shall be located in a safe, moisture and dust free location secure from unauthorized tampering. Otherwise a ventilated cabinet provided with a lock and key, suitably identified, shall be provided.

(2) Amplifiers for modified class "E" systems shall have the capacity to deliver sufficient power to operate all alarm sounding devices and voice communication system and have a 50 per cent reserve power capacity. In addition the amplifiers shall be wired in such a manner that the imminent failure or actual failure of amplifiers shall shut down the amplifier and indicate a trouble condition. Removal of an amplifier shall be indicated by a trouble signal at the fire command station. Opening of the control cabinets shall be supervised by a tamper switch producing a manually resettable trouble alarm at the fire command station.

(m) Fire command station. -The fire command station shall contain all the components described in the building code and shall have the capability of overriding floor warden stations, The command station console shall be provided with a hinged cover which permits the flashing "FIRE" visible signal to be seen, The cover shall be provided with an approved lock and key. The fire command station shall be provided with an information display system so located as to provide minimum distortion due to an angular line-of-sight and ambient lighting

conditions. This display shall have the capability to monitor the following systems in order of listed priority:

- (1) Manual Fire Alarm
- (2) Smoke Detection
- (3) Sprinkler Waterflow
- (4) Elevator Lobby Detector
- (5) Fire Signal Activation
- (6) Central Office Notification
- (7) Fan System On - Fan System Off
- (8) Fail Safe Locked Door
- (9) Fire Systems Trouble
- (10) Fire Signal Trouble
- (11) Tamper Switch Alarm
- (12) Power Source
- (13) Test/Normal Mode
- (14) Other Information as Desired

7. Painting of Equipment. -All enclosing cases for fire alarm, sprinkler alarm, smoke detection, and associated systems alarm apparatus shall be painted fire department red, except where approval is given by the commissioner to deviate from this requirement, The lobby information display system may be painted or finished to suit the owner of the building.

8. Information Display Systems. -

(a) Information display systems used in connection with modified class E fire alarm signal systems shall be of an approved electrically supervised type. The indicating devices shall describe the purpose they serve. The printed designation on unit or building information display system indicators shall be legible. The mechanism shall be so arranged that once operated, the indicating device must be reset manually. All conditions indicated shall remain displayed until manually cleared at the fire command station.

(b) A unit information display system shall be so designed that the operation of any station in the unit causes a visible and audible signal.

(c) Trouble displays shall be so arranged that the indicating device will reset automatically when the cause of trouble has been removed. The trouble information display system shall be so designed that it will indicate visible and audible trouble signals in the event of trouble occurring on any circuit monitored. The trouble information display system shall be actuated by the operation of supervisory devices.

(d) A silencing switch shall be provided for trouble signals, but shall not affect subsequent trouble signals.

(e) Information display systems shall be so designed that vibration from without or that caused by a trouble signal within will not operate the indicating devices.

(f) All remote information display systems shall be installed in a separate steel cabinet painted red, provided with approved lock and key. Information display system cabinets shall be marked in white letters at least one inch high with the words: "FIRE ALARM

Reference Standard 17

INFORMATION DISPLAY SYSTEM, ZONE -----" or "FIRE ALARM TROUBLE INFORMATION DISPLAY SYSTEM", whichever the case may be.

(g) Information display systems located in the lobby of a building whether an integral part of the fire command station or wall mounted shall have the legend "FIRE" in red letters three inches high together with an audible signal in addition to the lamp, target drop, cathode ray tube, light emitting diode, nixie, etc. and a separate or distinctive trouble signal shall sound. The audible signal accompanying an alarm shall be automatically silenced when the fire command station is operated by the fire safety director or his delegated substitute. Remote information display systems shall operate in the same manner.

(h) The display shall provide a minimum of four simultaneous alarm indicators with an overflow indication for additional alarms. Provisions shall be made to distinguish alarm conditions from non-alarm conditions. The display shall be updated as new information becomes available. If the same condition exists for more than one point on a floor or for more than one floor in a building, such as a fire gong actuation or public address, a separate output entry shall be displayed for each point or floor.

(i) Display format. - Each output entry shall include self-identifying mnemonic codes for the type of signal, building or area designation, floor or stair number and point location, and time of day. Systems utilizing gravity drops or lamps as point identification, may provide a hard copy print out.

(j) Maintainability. -

(1) Manual display of all points of annunciation for test purposes shall be provided.

(2) Capability shall be provided for interrogating any station or sensing element for test purposes, either at the remote device or by interrogation from the fire command station. Intervals of testing shall be as approved.

(3) Equipment design shall be modular so that all repairs may be performed on-site by substitution of duplicate components by authorized personnel.

(4) One each of these parts that are of a modular nature shall be included as spares at the fire command station.

9. Licensed Contractors. -Only a person holding a license or a special license in accordance with the provisions of the New York city electrical code, shall install, alter, or repair electrical wiring or apparatus for fire alarm systems in any building.

10. Used or Rebuilt Apparatus. -Used apparatus shall not be re-used for any interior fire alarm system until the same has been reconditioned in the shop of any approved manufacturer of interior fire alarm apparatus. Approval shall be obtained from the commissioner prior to installation. The use of reconditioned apparatus

whose manufacturer has discontinued manufacturing equipment is prohibited.

11. Standpipe Fireline Telephone and Signal System. -

Where the standpipe telephone and signal system is arranged to be used as a modified class E fire alarm signal system as provided in the building code, retractable telephone handsets shall be provided in pump rooms. The telephone in pump rooms shall be equipped with a loudspeaking receiver so that a voice can be distinctly heard at least 15 feet from the receiver.

12. Locked Door Fail Safe Systems. -

(a) Stairway reentry doors which are locked from the stairway side as permitted in section 27-371 of the administrative code shall be provided with an electrical fail safe strike release mechanism that will permit the door to be opened without a key when any automatic fire detecting device operates, elevator "Fireman Service" operates or power failure shall occur. In addition, provisions shall be made to permit these doors to be opened from the command station or mechanical control center. This system shall be manually reset.

(b) Wiring for these systems shall be electrically supervised for open and shorted or grounded circuits.

(c) Transformers for release mechanisms shall be rated for the proper use load, identified and located in proximity of the power supply for other fire alarm systems.

(d) The release mechanisms shall be operated from a separate control relay having the capability of indicating trouble on a separate trouble signal and at the information display system on the command console and at the mechanical control center. The mechanism shall also indicate a "failed" and "open" status on the command console and at the mechanical control center.

13. Radio System. -A radio or radio/wire system shall comply with the following requirements:

(a) The emergency notification portion of the system equipment shall be capable of the following:

(1) Have the capability of individual, group or entire building notification of an alarm tone and voice intelligibility.

(2) Receivers and wire extension speakers shall be permanently mounted to a wall or pillar.

(3) There shall be automatic switch over to emergency battery power supply.

(b) Two-way communication shall be accomplished by fixed transmitters and receivers.

(c) Equipment shall be Federal Communications Commission (FCC) approved, FM type, solid state, above 150.8 MHz. Selective signaling shall be accomplished by a minimum of 2 tone code operation.

(d) The antenna shall be designed and installed for use at the fire command station transmitter and be capable of transmitting to all fixed stations.

Reference Standard 17

(e) The fire command station unit shall have the capability of locking out all other remote control points.

14. Sprinkler Waterflow Alarms. -A sprinkler waterflow alarm may be arranged to be used as part of a modified class E fire alarm signal system provided: the alarm signal system shall be an approved electrically supervised closed circuit information display system capable of indicating the floor where the sprinkler was activated.

15. Elevator communication:

Elevator intercommunication shall be acceptable for communications with the Fire Command Station if there is a means of communication proximate to the Fire Command Station.

**Local Law 16-1984*

***DOB 4-13-03; DOB 1-9-02; Local Law 16-1987; Local Law 5-1973; 49-74 BCR*

** REFERENCE STANDARD RS 17-3C STANDARDS FOR THE INSTALLATION OF VISUAL AND AUXILIARY ALARMS REQUIRED BY SECTION 27-292.15

1. Definitions.

(a) Visual Alarms (Strobe): Visual alerting device which when activated by either an integral or an external initiating device provides an alarm signal in the form of a flashing high intensity light source (usually xenon) with frequency approximately of one (1) Hz.

(1) System Type Strobe: A strobe connected by direct wiring to an overall fire alarm system and upon which it depends for its actuating signal.

(2) Extension Type Strobe: A strobe connected by direct wiring to a single station smoke detector and upon which it depends for its actuating signal.

(b) Auxiliary Alarms. -

(1) Portable System Type Strobe: Strobe equipped with cord and plug (power supply), and a receiver arranged to detect the presence of the alarm tone, emitted by the fire alarm system thereby causing it to operate (flash).

2. General Requirements. -

(a) An installation of a new fire alarm and signal system incorporating audible devices intended to evacuate building occupants shall require strobes to be installed as part of the system.

(b) Installation of strobes in existing buildings may either be installed as part of an interior fire alarm and signal system or be connected to an approved strobe control panel.

3. Power Supply. -

(a) Except as noted in (b) below, strobes that are subject to the requirements of section two above, shall derive power from the interior fire alarm and signal system.

(b) When not powered by the interior fire alarm and signal system, independent strobe control panels shall supply power to strobes. Such control panels shall derive their power from a normal or emergency 120 volt source supplying the floor, via a separately installed locked fire alarm cutout connected to electrical supply in accordance with the requirements of the Electrical Code.

4. Strobe Control Panel. -

(a) A strobe control panel shall be approved by the Bureau of Electrical Control or approved by the Board of Standards and Appeals.

(b) The panel shall cause fire alarm signal received from interior fire alarm system to activate strobes.

(c) The panel shall have a battery and charger capable of providing at least fifteen (15) minutes of full system alarm operation following twenty four (24) hours of supervisory operation.

(d) Strobes may be reset from the fire command station by an identified reset device. When strobes cannot be turned off from the fire command station, a timer to shut off the strobes and reset the panel five (5) minutes after they are activated shall be provided in the panel.

(e) The panel shall incorporate electrical supervision of

(1) Alarm circuitry for strobes,

(2) Initiating circuitry from the building fire alarm system.

(3) The 120 VAC power source, and battery.

(f) The panel shall have a trouble contact for reporting to the interior fire alarm and signal system and shall have remote trouble bell.

(g) The panel shall be capable of disconnecting any flashing or in-motion lighting that may make strobes ineffective.

(5) Wiring. -The flashing strobes powered either through an interior fire alarm and signal system or independently through a control panel shall operate in conjunction with the audible signals and shall:

(a) Meet the requirements of Reference Standard RS 17-3A when required in a Class E, Class C and Class J fire alarm signal and signal system.

(b) Meet the requirements of Reference Standard RS 17-3B when required in a Modified Class E and Modified Class J fire alarm and signal system and

(c) Meet the requirements of Reference Standard RS 17-3 when required in any other fire alarm and signal system.

6. Portable System Type Strobe. -

(a) The strobe shall have a battery and charger capable of providing at least five (5) minutes of strobe operation following twenty-four (24) hours or supervisory operations.

(b) The strobe shall have a visual trouble indication when power is lost.

7. Location of Strobes. -

Reference Standard 17

(a) When strobes are installed on walls, they shall be a minimum of 80 inches above the floor or a maximum of 6 inches below the ceiling.

(b) When strobes are installed in ceilings, there shall be no other devices (such as exit lights) or building appurtenances (such as beams or smoke curtains) within 5 feet of the strobe.

****DOB 4-13-03; 886-89 BCR**

**** REFERENCE STANDARD RS 17-3D**

Repealed

****Local Law 16-1987**

† REFERENCE STANDARD RS 17-4

ANSI/NFPA No. 214-1988-Standard on Water Cooling Towers.

†310-90 BCR; 633-83 BCR

**** REFERENCE STANDARD RS 17-5**

ANSI/NFPA No. 72-1993 - National Fire Alarm Code. The provisions of NFPA 72-1993 with the exception of Chapter 2 shall apply subject to the following modifications. The section and paragraph numbers are from that standard.
Note: Chapter 2 of NFPA 72-1993 entitled "Household Fire Warning Equipment" shall not be part of this reference standard.

The requirement of NICET Certification as outlined under Section 7-1.2.3 shall be applicable beginning on January 14, 2006.

CHAPTER 1 - FUNDAMENTALS OF FIRE ALARM SYSTEMS

Add the definition of Evacuation Zone between Evacuation Signal and Exit Plan in Section 1-4.

Evacuation Zone. – An evacuation zone is an area of a floor, an entire floor, several floors or the entire building that is always intended to be evacuated simultaneously.

Amend the following definitions:

Section 1-5.2.3 – Delete exceptions No. 1 and No. 2.

Section 1-5.2.6 – Delete sub-paragraph (c).

Section 1-5.2.8.4 B Delete

Section 1-5.2.9.2(c) B Delete

Section 1-5.2.10 - Delete in its entirety.

Section 1-5.2.11 - Delete in its entirety.

Section 1-5.4.1 - Delete

Section 1-5.4.2.1 is modified as follows:

Section 1-5.4.2.1 Coded Alarm Signal - A coded alarm signal shall consist of not less than [three] four complete rounds of the number transmitted, and each round shall consist of not less than three impulses.

Section 1-5.4.3 - Delete in its entirety.

Section 1-5.4.7 - Delete the exception.

Section 1-5.4.8 Delete and substitute the following:

Section 1-5.4.8 Alarm Signal (*Silence*). – A means of silencing the alarm notification appliances shall be located within a locked F.A. Control Cabinet. Such a means shall be permitted only if a visible zone alarm indication or equivalent has been provided, as specified in 1-5.7, and subsequent alarms on other initiating

device circuits will cause the notification appliances to reactivate. A means that is left in the "off" position when there is no alarm shall operate an audible visible trouble signal until the means is restored to normal.

Section 1-5.4.10 - Delete

Section 1-5.5.4 - Delete

Section 1-5.6 - Delete

Section 1-5.7.1.1 - Delete the first paragraph up to . . . "in a fire situation."

Section 1-5.8.1 - Delete "within 200 seconds" from the end of the paragraph. Also delete "Exception #10."

Section 1-5.8.4 - Delete "exception #3."

Section 1-5.8.5.1 - Delete the exception of Subsection (b).

Section 1-5.8.6.1 - Delete exceptions #3 and #4.

Section 1-5.8.6.2 - Delete

Section 1-5.8.6.3 - Delete

Section 1-7 - Delete in its entirety.

CHAPTER 3 - PROTECTED PREMISES FIRE ALARM SYSTEMS

Section 3-2.1 - Delete

Section 3-3 - Delete subdivisions (h), (i) & (k)

Section 3-4.2 - Delete exceptions #3 and #5

Section 3-5.2 - Delete

Section 3-5.3 - Delete

Section 3-7.2(a) - Delete the effective date of the requirements.

Section 3-8.1.2 - Amended to read as follows:

Section 3-8.1.2 – For fire alarm systems employing automatic fire detectors or waterflow detection devices, at least one fire alarm box shall be provided to initiate [a] the same fire alarm signal as required by automatic fire detectors or waterflow detection devices. This fire alarm box shall be located where required by the authority having jurisdiction.

Section 3-8.3 - Delete

Section 3-8.6.2 shall be modified to read as follows:

Section 3-8.6.2 – A dry-pipe or preaction sprinkler system that is supplied with water by a connection beyond (downstream from) the alarm initiating device of a wet-pipe system shall be equipped with a separate waterflow alarm initiating pressure switch or other approved means to initiate a waterflow alarm.

Section 3-8.9.1 – Modify to read as follows: The operation of an automatic fire suppression system installed within the protected premises shall be indicated as an alarm on the protected premises fire alarm system.

Section 3-8.10.1 - Delete last paragraph starting from "all phases . . ."

Section 3-8.10.2 - Delete

Section 3-8.14 - Delete in its entirety.

Section 3-8.15.4 - Modify second sentence to read as follows: The operation of the elevators shall be in accordance with [ANSI/ASME A17.1, *Safety Code for Elevators and Escalators*, Rules 211.3 through 211.8] RS 18-1. Delete the third sentence.

Section 3-8.15.4 (a) - Delete

Section 3-8.15.4 (b) - Delete

Reference Standard 17

Section 3-8.16 - Delete.

Section 3-9.2.3 Modify to read as follows: When permitted by the authority having jurisdiction. Transfer of data over listed communication ports shall be an acceptable means of interfacing between the fire alarm control unit and fire safety function control devices.

Section 3-9.3.3 B Delete and substitute the following: Section 3-9.3.3 – Connections between fire alarm systems and the HVAC system for the purpose of monitoring and control shall be arranged such that primary control (the control that all other controls are secondary or subservient to) capability rests with the fire alarm control unit(s) under all circumstances, and in addition, shall operate and be monitored in accordance with Reference Standards RS 13-1, RS 17 and the authority having jurisdiction.

Add Section 3-9.3.4 as follows:

Section 3-9.3.4 – Those HVAC fans or fan systems which have been automatically shut-down by virtue of the activation of any fire alarm control unit or device shall be arranged and equipped not to automatically restart when the fire alarm control unit or device is reset. At least two manual means of restarting the fans or fan systems shall be required, such as manually resetting the fire alarm control unit or device and the manually resetting the fan or fan system controls.

Add Section 3-9.3.5 as follows:

Section 3-9.3.5 – Fans or fan systems that were automatically shut down by the fire alarm control unit or device in Class ‘E’, ‘J’ and ‘C’ systems shall be manually enabled to start by a means of overriding the fan shutdown through use of a city-wide standard key switch (#2642) located at the Fire Command Station. The actual start of the fan(s) shall be accomplished manually through HVAC controls at the Fire Command Station, or at the Mechanical Control Center or locally at the fan room(s).

Add Section 3-9.3.6 as follows:

Section 3-9.3.6 – Smoke exhaust control means shall be enabled through the use of a city-wide standard key (#2462) located at the Fire Command Station or fire alarm control unit, or when neither is provided, in the entrance lobby of the building.

Section 3-10.4 - Delete

Section 3-11 - Delete in its entirety.

Section 3-12.3 - Delete in its entirety.

Section 3-12.4.1 - Delete the exception.

Section 3-12.4.2 - Delete

Section 3-12.4.3.1 - Delete

Section 3-12.4.3.2 - Delete

Section 3-12.4.4 - Delete

Section 3-12.4.5.1 - Delete the third sentence starting from "The fire command station shall be permitted . . ."

Section 3-12.4.6.2 B Delete

Section 3-12.4.6.3 - Delete

Section 3-12.5.1-Delete

Section 3-12.6.6 B Delete

Section 3-12.6.7 - Delete

CHAPTER 4

Deleted in its entirety (this chapter is for fire alarm central offices, which falls under the Fire Department's jurisdiction).

CHAPTER 5 - INITIATING DEVICES

Section 5-1.3.4 - Delete "*appropriate NFPA standard or*" from the first sentence.

Section 5-1.3.5 - Delete

Section 5-2.2 - Delete "*either by the appropriate NFPA standard or*" from the sentence.

Section 5-3.2- Delete "*either by the appropriate NFPA standard or*" from the sentence.

Section 5-3.5.9 - Add, "*Where required by the authority having jurisdiction*" at the beginning of the paragraph.

Section 5-3.6.2 - Add, "*Where required by the authority having jurisdiction*" at the beginning of the paragraph.

Section 5-5.2 - Delete "*either by the appropriate NFPA standard or*" from the paragraph.

Section 5-6.1 - Delete "*either by the appropriate NFPA standard or*" from the second sentence.

Section 5-8.1 - Substitute the words "*approvals/acceptances*" for "*listings*".

Add Section 5-8.2 to read as follows:

Section 5-8.2 – Appropriate means may involve:

(a) Foam Systems: Flow of Water

(b) Pump Activation

(c) Differential Pressure Detector

(d) Halon: Pressure Detector

(e) Carbon Dioxide: Pressure Detector

In any case, an alarm that activates the extinguishing system may be initiated from the detection system.

Section 5-9.1.1 - Change the second sentence to read as follows: "*The operable part of each manual fire alarm box shall be 4 feet above finished floor level.*"

Section 5-9.1.2 - Delete

Section 5-9.1.3 - Change the number of repetitions produced from three to four.

Sections 5-9.2 to 5-9.2.11 - Delete

Sections 5-9.2.12 to 5-9.2.12.6 - Delete

Sections 5-9.2.13 to 5-9.2.14.2 - Delete

Section 5-10.5 – Delete and substitute the following:

Section 5-10.5 – Room Temperature Supervisory Signal-Initiating. B When temperature supervisory devices are provided to indicate a low temperature condition, they shall indicate the decrease in room temperature to 40° F (4.4° C) and its restoration to above 40° F (4.4° C).

Section 5-11.4.2 - Delete "*NFPA 90A, Standard for the installation of Air Conditioning and Ventilating Systems*" and substitute with "*Reference Standard RS 13-1.*"

Section 5-11.5.2.1 - Delete "*other NFPA standards*" and substitute with "*Reference Standard RS 13-1.*"

Figure 5-11.7.4.1.1.(D) to read "*One detector mounted on the higher side*"

Reference Standard 17

CHAPTER 6 - NOTIFICATION APPLIANCES FOR FIRE ALARM SYSTEMS

Section 6-3.7 – Amend to read as follows:

Section 6-3.7 – Location of Audible Signal Appliances. Where ceiling heights permit, wall mounted appliances shall have their [tops] centerline at heights above the finished floors of [not less than 90 in. (2.30m)] 8 ft. (2.45m) and [below the finished ceilings of not less than 6 in. (0.15 m)] where ceiling heights prevent installation at this height installation shall be not greater than 6 in. (0.15m) below. This shall not preclude ceiling-mounted or recessed appliances.

Exception: Combination audible/visible appliances [installed in sleeping areas shall comply with 6-4.4.3].

Section 6-4.2 - Delete

Section 6-4.4 is modified to read as follows:

Section 6-4.4 Appliance Location. – Wall-mounted appliances shall have their bottoms at heights above the finished floor of no less than 80 in. (2-m) nor less than 6 in. (13.5 cm) below the ceiling, whichever is lower. [and no greater than 96 in. (2.4 m).] Ceiling-mounted appliances [shall] may be installed [per Table 6-4.4.1(b)].

Exception: Appliances installed in sleeping areas shall comply with 6-4.4.3.

Figure 6-4.4.1 - Delete

Section 6-4.4.1.1 is modified to read as follows:

Section 6-4.4.1.1 – Spacing shall be in accordance with [Figure 6-4.4.1 and] Table[s] 6-4.4.1(a) [and (b)]. A maximum separation between appliances shall not exceed 100-ft. (30 m). Visible notification appliances shall be installed in accordance with Table 6-4.4.1 (a), using one of the following:

(a) A single visible notification appliance, or
(b) Two visible notification appliances located on opposite walls, or

(c) In rooms 80 ft. by 80 ft. or greater, where there are more than two appliances in any field of view, they shall be spaced a minimum of 55 ft. from each other, or

(d) More than two visible notification appliances that flash in synchronization.

Section 6-4.4.2.1 is modified to read as follows:

Table 6-4.4.2 applies to corridors not exceeding 20 ft. (6.1 m) wide. For corridors greater than 20 ft. (6.1 m) wide, refer to [Figure 6-4.4.1 and] Table[s] 6-4.4.1(a) [and (b)]. In a corridor application, visible appliances shall be UL 1971 rated not less than 15 cd, and shall have an on-axis intensity of not less than 75 cd.

Table 6-4.4.1 (a) is modified as follows:

Table 6-4.4.1(a) Room Spacing Allocation for Wall-Mounted Visible Appliances Minimum Required Light Output, Candela (cd) (Effective Intensity) (see note below)

Maximum Room Size	One Light Per Room(cd)	Two Lights per Room (Located on Opposite Walls) (cd)	Four Lights per Room - One Light per Wall (cd)
20' x 20'	15	N/A	N/A
30' x 30'	30	15	N/A
40' x 40'	60	30	[15] N/A
45' x 45'	75	60	N/A
50' x 50'	95	60	[30] N/A
55' x 55'	110	75	N/A
60' x 60'	135	95	[30] N/A
70' x 70'	185	110	[60] N/A
80' x 80'	240	140	60
90' x 90'	305	180	95
100' x 100'	325	240	95
110' x 110'	455	240	135
120' x 120'	540	305	160
130' x 130'	635	375	185

NOTE: *Candela (cd) ratings, as indicated, are based on UL 1971 listings. On-axis ratings shall in no case be less than 75 cd.*

Table 6.4.4.1(b) - Delete

Section 6-6 - Delete

Section 6-6.1 - Delete

Section 6-6.2 - Delete

Section 6-8 - Delete in its entirety.

Section 6-9 - Delete in its entirety.

CHAPTER 7

Section 7-1.1.1 is modified to read as follows:

Section 7-1.1.1 – Inspection, testing and maintenance programs shall satisfy the requirements of [this code] the Fire Commissioner, the New York City Building Code and the equipment manufacturer's instructions.

Reference Standard 17

Section 7-1.2 - Delete the second sentence starting from "Delegation."

Section 7-1.2.1 - Delete

Section 7-1.2.2 - Delete and enact three new sections as follows:

Section 7-1.2.2 – Personnel shall be qualified and experienced in the inspection and testing of fire alarm systems and shall meet the following requirements:

(a) Certified by the Buildings and/or Fire Commissioners, or

(b) Trained and qualified personnel of a NYC licensed electrical contracting firm, or

(c) Personnel with National Institute for Certification in Engineering Technologies (NICET) Certification of Level II in fire alarm technology, or

(d) Trained and qualified personnel of firm listed by a national testing laboratory for servicing of fire alarm systems.

Section 7-1.2.3 – Personnel shall be qualified and experienced in the maintenance of fire alarm systems and shall meet the following requirements:

(a) Factory trained and certified, or

(b) Trained and qualified personnel of NYC licensed electrical contracting firm, or

(c) Trained and qualified personnel of firm listed by a national testing laboratory for servicing of fire alarm systems.

(d) Service personnel employed pursuant to (a), (b), and (c) above shall either have a valid NICET Certification of Level II in fire alarm technology or work under the direct supervision of a person having such certification.

Exception: The following are exempt from the above requirements:

(1) Person(s) exclusively performing smoke detector cleaning, having a Certificate of Fitness from the Fire Department and working under the supervision of, or employed by a person(s) having NICET Level II certification.

(2) Person(s) exclusively performing maintenance of fire alarm systems installed and approved prior to 1987, and working under the supervision of, or employed by a person(s) having NICET Level II certification.

(e) If during the course of maintenance either:

(1) total system replacement, or

(2) wiring repair, or

(3) replacement of wiring is (are) indicated, such repair(s) or replacement(s) shall be performed by a person holding a license or a special license in accordance with the provisions of the NYC Electrical Code.

Section 7-1.4 is modified to read as follows:

Section 7-1.4 – Prior to system maintenance or testing, [the system certificate and the] all information regarding the system and Y to the service personnel.

Section 7-1.5.1 - Delete and substitute the following:

Section 7-1.5.1 – The special hazard system and main building system shall be tested concurrently.

Section 7-1.6 B Amend the last sentence to read as follows:

In addition, except for Class "E", "J" and "C" systems, 10 percent of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, shall also be tested and proper system operation verified.

Section 7-2.1 B Delete

Section 7-2.2 – Delete and substitute the following:

Section 7-2.2 – Testing, which involves the disconnection of circuits of 50 volts or more with the exception of audio circuits up to 75 volts, shall be performed in accordance with the New York City Electrical Code by licensed electrical contracting firms meeting the requirements of Sections 7-1.2.3 and 7-1.2.3.1.

Sections 7-3.1 to 7.3.1.2 - Delete

Section 7-3.2 shall be deleted and substitute the following:

Section 7-3.2 Testing – Testing shall be performed in accordance with the requirements of the Fire Prevention Code.

Sections 7-3.2.1 to 7-3.4 - Delete

Section 7-4.1 shall be deleted and substitute the following:

Section 7-4.1 – Fire alarm system equipment shall be periodically maintained in accordance with manufacturers' instructions and the Fire Prevention Code.

Sections 7-4.2 to 7-4.4 - Delete

Sections 7-4.4.1 to 7-4.4.3.2 - Delete

Section 7-5.1 - Delete

Sections 7-5.3 to 7-5.4 - Delete

CHAPTER 8 - REFERENCED PUBLICATIONS

Delete in its entirety.

APPENDIX A - EXPLANATORY MATERIAL

This appendix is not part of Reference Standard RS 17-5, but is included for information purposes only with the exception of the following:

Section A-6-4.4.1 - Delete in its entirety and substitute the following:

Section A-6-4.4.1 – A design which delivers 0.0375 lumens per sq. ft. effective intensity to all occupied spaces where visible notification is required, is considered to meet minimum light intensity requirements of this section. The field of view is based on the focusing capability of the human eye, specified as 120 degrees in the IES Handbook. The apex of this angle is the viewer's eye. In order to ensure compliance with the requirements of Section 6-4.4.1, it has been accepted that this angle be increased to approximately 135 degrees.

Figure A-6-4.4.1 (a) - Delete

Figure A-6-4.4.1 (b) - Delete

Figure A-6-4.4.1 (c) - Delete

Figure A-6-4.4.1 (d) - Delete

Figure A-6-4.4.2 - Delete

APPENDIX B - ENGINEERING GUIDE FOR AUTOMATIC FIRE DETECTOR SPACING

This appendix is not part of Reference Standard RS 17-5, but is included for information purposes only.

**** DOB 1-9-02; 310-90 BCR**

*** REFERENCE STANDARD 17-5A**

Repealed

***310-90 BCR; 1014-80 BCR**

Reference Standard 17

*REFERENCE STANDARD RS 17-5B

Repealed

*310-90 BCR; 1014-80 BCR

† REFERENCE STANDARD RS 17-5C

Repealed

†310-90-BCR; 633-83 BCR

*REFERENCE STANDARD RS 17-5D

Repealed

*310-90 BCR; 1014-80 BCR

*REFERENCE STANDARD RS 17-5E

ANSI/NFiPA No. 72E-1990-Standard for Automatic Fire Detectors.

*310-90 BCR; 1014-80 BCR

*REFERENCE STANDARD RS 17-6

ANSI B16.4-1985-Cast-Iron Threaded Fittings, Class 125 and 250.

*310-90 BCR; 1014-80 BCR

**REFERENCE STANDARD RS 17-6A

Valves and Related Products for Fire Protection Service.

UL193-1988-Alarm Valves for Fire-Protection Service (Revision 9/88).

UL260-1988-Dry Pipe and Deluge Valves for Fire-Protection Service.

UL262-1988-Gate Valves for Fire-Protection Service.

UL312-1988-Gate Valves for Fire-Protection Service (Revision 10/89).

***UL668-1988-Hose Valves for Fire-Protection Service.

UL753-1989-Alarm Accessories for Automatic Water Supply Control Valves For Fire-Protection Service (Revision 8/89).

UL789-1987-Indicator Posts for Fire-Protection Service (Revision 3/89).

UL1091-1986-Butterfly Valves for Fire-Protection Service.

UL1468-1985-Direct-Acting Pressure-Reducing and Pressure-Control Valves for Fire-Protection Service.

UL 1486-1979-Quick Opening Devices for Dry Pipe Valves for Fire-Protection Service (Revision 7/85).

UL1726-1985-Automatic Drain Valves for Standpipe Systems (Revision 9/88).

UL1739-1988-Pilot-Operated Pressure Control Valves for Fire-Protection Service.

**310-90 BCR

***As enacted but "UL668-1989" probably intended.

**REFERENCE STANDARD RS 17-7

ANSI/AWWA C110-1987-Ductile-Iron and Grey-Iron Fittings, 3-Inch through 48-Inch for Water and Other Liquids.

**310-90 BCR; 1014-80 BCR

† REFERENCE STANDARD RS 17-8

ANSI/††ASTM C111-1985-Rubber-Gasket Joints for Ductile-Iron and Grey-Iron Pressure Pipe and Fittings.

†310-90 BCR; 633-83 BCR

†† As enacted but "AWWA" probably intended.

† REFERENCE STANDARD RS 17-9

ANSI/ASTM A234-1988b-Specification for Pipe Fittings for Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.

†310-90 BCR; 633-83 BCR

† REFERENCE STANDARD RS 17-10

ANSI/NFiPA No. 22-1987-Standard for Water Tanks for Private Fire Protection.

†310-90 BCR; 633-83 BCR

† REFERENCE STANDARD RS 17-11

UL No. 217-1985-Single and Multiple Station Smoke Detectors including Revision of February †††19, 1989.

†310-90 BCR; 633-83 BCR

†††As enacted but "27," probably intended.

***REFERENCE STANDARD RS 17-12

ANSI/NFiPA No. 74-1989-Standard for the Installation, Maintenance and Use of Household Fire Warning Equipment, as Modified. The following Sections of this standard are modified to read as follows:

1-1 Scope. Covers the requirements for the proper selection, installation, operation and maintenance of fire warning equipment for use within dwelling units or rooming units.

1.2.6 The installation of wiring and equipment shall be in accordance with the New York City Electrical Code.

2-1.1.1 Smoke detectors shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units, in Occupancy Groups J-2 and J-3, and in Basements and Basement Recreation Rooms in Occupancy Group J-3.

Smoke detectors shall be installed within the sleeping area of hotel or motel units, rooming units or studio dwelling units in Occupancy Group J-1.

4-5.5 Each smoke detector shall have an integral test means to permit the occupant to check that it is operational. A continuous power display indicator light is recommended.

4-2.1.4 A smoke detector installed to protect a sleeping area in accordance with 2-1.1.1, shall be located outside the bedroom but in the immediate vicinity of the sleeping area, except as set forth for rooming units.

5-2.1.6 Smoke detectors shall be located on or near the ceiling, and within fifteen feet of all rooms used for sleeping purposes in J-2 or J-3 occupancies. In all dwelling units, with multiple levels, when any level has only one means of egress, the dwelling unit shall be provided with smoke detectors on all levels.

5-2.1.6.1 If ceiling mounted, the closest edge of the detector shall be a minimum of four inches from any wall.

5-2.1.6.2 If wall mounted, the closest edge of the detector shall be a minimum of four inches and a maximum of twelve inches from the ceiling.

***310-90 BCR; 798-81 BCR

Reference Standard 17

†† Reference Standard 17-13

UL No. 2034, Standard for Single and Multiple Station Carbon Monoxide Detectors, October 29, 1996, with revisions through June 28, 2002.

††*DOB 10-26-04*

†† Reference Standard 17-14

NFPA No. 720, Recommended Practice for the Installation of Household Carbon Monoxide (CO) Warning Equipment, 2003 Edition, as modified. The following sections of this standard are modified to read as follows (deleted text is in brackets; new text is italicized):

Title on page 720-4: “NFPA 720 Recommended Practice for the Installation of [Household] Carbon Monoxide (CO) Warning Equipment, 2003 Edition”

1.1.2 This document is limited to carbon monoxide warning equipment for use in *J-1, J-2, J-3, G and H-2 occupancies* [family living units] that contain fuel-burning *equipment*, appliances or fireplaces or have attached garages.

1.1.3 This document contains recommendations for the selection, installation, operation, and maintenance of equipment that detects concentrations of carbon monoxide that could pose a risk to the health of most occupants [in family living units].

2.3.1 UL Publication. Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062. UL 2034. Standard for Single and Multiple Station Carbon Monoxide Detectors, October 29, 1996, *as revised through June 28, 2002*.

3.2.2* Authority Having Jurisdiction (AHJ). *The New York City Department of Buildings, New York City Fire Department, New York City Department of Housing Preservation and Development, and New York City Department of Health and Mental Hygiene*. [The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.]

3.3.3 *Dwelling* [Family Living] Unit. *One or more rooms in a building occupied in whole or in part as the temporary or permanent home or residence of one or more families, where such room or rooms are arranged, designed, used or intended for use by one or more families, including such units in occupancy groups J-1 (hotels, motels, lodging houses, rooming houses, etc.), J-2 (apartment houses, apartment hotels, school dormitory buildings, etc.), and J-3 (one- and two-family dwellings, rectories, convents, group homes, etc.)*. [One or more rooms in a single family detached dwelling, single family attached dwelling, multifamily dwelling, or mobile home for the use of one or more persons as a housekeeping unit with space for eating, living, and sleeping and permanent provisions for cooking and sanitation.]

3.3.9 Separate Sleeping Area. The area of a *dwelling* [family living unit] where the bedrooms or sleeping rooms are located.

3.3.10.1 Alarm Signal. A signal indicating a concentration of carbon monoxide that could pose a risk to the life safety of the occupants [in the family dwelling unit] and requiring immediate attention.

4.2 Supplemental Functions. Supplemental functions, including the transmission of an alarm beyond the *premises* [household] should be permitted and should not interfere with the performance recommendations of this document.

4.3 Total System. Where the AHJ requires both the alarm and transmission beyond the *premises* [household] and the total system to comply with the applicable sections of [NFPA 72, National Fire Alarm Code] *RS 17-3, 17-3A, or 17-3B*, the recommendation of Section 5.1 and 5.4.2 of this document *shall* [should] be followed. Title of Chapter 5: Chapter 5 [Household] Carbon Monoxide Warning Equipment

5.1 *Required* [Recommended] Protection.

5.1.1.1 A carbon monoxide detecting alarm or detector *shall* [should] be centrally located *as provided for in § 5.1.2 and 1 R.C.N.Y. § 28-02* [outside of each sleeping area in the immediate vicinity of the bedrooms].

5.1.1.3 Each alarm or detector *shall* [should] be located on the wall, ceiling, or other location as specified in the installation instructions accompanying the unit. *To help prevent false alarms, such alarm or detector should be located away from sources of humidity such as bathrooms and should be located away from a range or other fossil fuel burning equipment. To prevent damage by occupants, such alarm or detector should be located out of reach of children and pets.*

5.1.2 Alarm notification appliances. Each alarm or detector *shall* [should] cause the operation of an alarm notification appliance that *shall* [should] be clearly audible in all bedrooms over background noise with all intervening doors closed, *in accordance with Annex A, § A.5.1.1.1*.

5.2.1.1 All power supplies *shall* [should] have sufficient capacity to operate the signal(s) for at least 12 continuous hours.

5.2.1.2 For electrically powered household carbon monoxide warning equipment, the primary (main) power source *shall* [should] be ac, unless otherwise permitted by the following:

(1) Detectors and alarms are permitted to be powered by a monitored dc circuit of a control unit when power for the control unit meets the recommendations of section 5.2 and the circuit remains operable upon the loss of primary (main) ac power.

(2) A detector and a wireless transmitter that serves only that detector are permitted to be powered from a monitored batter (main) source where part of a listed, monitored, low-power radio (wireless) system.

[(3) In existing construction, a monitored battery primary (main) power source, as described in 5.2.3, is permitted.]

5.2.2.1 An ac primary (main) power source *shall* [should] be a commercial light and power supply or other dependable source *and shall be provided with a secondary (standby) power supply complying with § 5.2.4*.

5.2.2.2 A visible “power on” indicator *shall* [should] be provided.

Reference Standard 17

5.2.2.3 Primary (main) ac power *shall* [should] be supplied from either a dedicated branch circuit or the unswitched portion of a branch circuit also used for power and lighting.

5.2.2.4 All electrical systems *shall comply with the New York City Electrical Code* [designed to be installed by other than a qualified electrician should be powered from a source not in excess of 30 volts that meets the requirements for Class 2 circuits as defined in Article 725 of NFPA 70, National Electrical Code®].

5.2.2.7 The recommendation of 5.2.2.6 does not apply *in J-1, J-2, and J-3 occupancies* where a ground fault circuit interrupter serves all electrical circuits within the household.

5.2.2.9 [Where a secondary (standby) battery is provided, the] *The* primary (main) power supply should be of sufficient capacity to operate the system under all conditions of loading with *the* [any] secondary (standby) battery disconnected or fully discharged.

5.2.3 Primary Power Supply – Monitored Battery. [Household] [c]Carbon monoxide warning equipment *may* [should] be [permitted to be] powered by a battery *only where permitted by 1 R.C.N.Y. 28-02 and*[,] provided that the battery is monitored to ensure that the following conditions are met:

- (1) All power recommendations are met for at least one year of battery life, including monthly testing.
- (2) A distinctive audible trouble signal sounds before the battery is incapable of operating the device(s) (from causes such as aging or terminal corrosion) for alarm purposes.
- (3) Automatic transfer is proved from alarm to a trouble condition for a unit employing a lock-in alarm feature.
- (4) The unit is capable of producing an alarm signal for at least 12 hours at the battery voltage at which a trouble signal is normally obtained, followed by not less than 7 days of trouble signal operation.
- (5) After the initial 4 minutes of alarm, the 5-second “off” time of the alarm signal should be permitted to be changed to 60 seconds ± 10 percent.

5.2.4.1 When provided, a secondary (standby) power supply *shall* [should] have sufficient capacity to power the unit for 8 hours, followed by not less than 12 hours of alarm, followed by not less than 7 consecutive days of trouble signals.

5.2.4.2 After the initial 4 minutes of alarm, the 5-second “off” time of the alarm signal *shall* [should] be permitted to be changed to 60 seconds ± 10 percent.

5.2.4.3 Removal or disconnection of a battery used as a secondary (standby) power source *shall* [should] cause [an] audible [or] *and* visible trouble signals. The word *should* which indicates recommendation shall be replaced with the word *shall* which indicates mandated compliance in the following sections:

5.2.4.6

5.3.1.3

5.3.2.1 through 5.3.2.4

5.3.3.1

5.3.4.1 and 5.3.4.2

5.3.5.1 through 5.3.5.3

5.3.6.1 through 5.3.6.4

5.3.6.5 Each electrical carbon monoxide system *shall* [should] have an integral test means to allow the *occupants* [householder] to test the system operation.

The word *should* which indicates recommendation shall be replaced with the word *shall* which indicates mandated compliance in the following sections:

5.3.7.1 and 5.3.7.2

5.3.8.1 Where carbon monoxide alarms or detectors are interconnected to fire alarm or combination control units, connections *shall* [should] be via *alarm* [supervisory] circuits only, *and all alarms and/or detectors and control units shall be certified as compatible by the manufacturer(s) and shall be approved by the Materials Equipment Acceptance Division of the Department of Buildings.*

The word *should* which indicates recommendation shall be replaced with the word *shall* which indicates mandated compliance in the following sections:

5.3.8.2 and 5.3.8.3

5.3.9.1 Supervising station systems requiring transmission of signals to continually staffed locations providing supervising station services (for example, central station service, proprietary stations, or remote stations) *shall* [should] also comply with the applicable requirements of [Chapter 8 of NFPA 72®, National Fire Alarm Code.®] *3 R.C.N.Y 17-01, Rules of the Fire Department of New York.*

5.3.9.2 Where carbon monoxide alarms, detectors, multipurpose detectors, or combination or multiple station alarms or systems are connected to supervising station fire alarm systems, receipt of alarm signals *shall* [should] be distinctively indicated as “*alarm* [supervisory] signal carbon monoxide” or other non-fire alarm signal designation acceptable to the AHJ.

5.3.9.3 Signals received by the supervising station *shall* [should] be processed by the supervising station personnel in accordance with the *rules of the Fire Department of New York.* [following recommendations:

- (1) They should retransmit the supervisory signal to public fire service communications center.
- (2) They should notify the subscriber by the quickest available method.
- (3) When the signal results from a pre-arranged test, action recommended by 5.3.9.3 (1) and (2) is not necessary.]

5.3.10.1 Carbon monoxide warning systems utilizing low-power wireless transmission of signals within the protected [household should] *premises shall* comply with the *applicable* requirements of [NFPA 72®, National Fire Alarm Code®] *RS 17-3, 17-3A, or 17-3B, and must be approved by the Material Equipment Acceptance Division (MEA).*

The word *should* which indicates recommendation shall be replaced with the word *shall* which indicates mandated compliance in the following sections:

5.4.1.1 through 5.4.1.6

5.6.1 through 5.6.3

††DOB 10-26-04