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

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*****DOB 1-9-02***

*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 1st Floor or Fire Pump (ft.)	Class of 2 ½ Hose Outlet Valves	Type of Pipe	Fittings (wwp in psi)	Check and 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
625 to 1,112	B[b]	Schedule 80 carbon steel	800	800
1,112 and over	B[b]	Schedule 80 carbon steel	1,000	1,000

Notes.-

[a]For 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.

[b]For 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.

[c]Six inches and larger section and riser control valves shall have a valved bypass.

[d]Siamese connections shall be rated for the same pressure as is required for interior fittings and valves.

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(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.

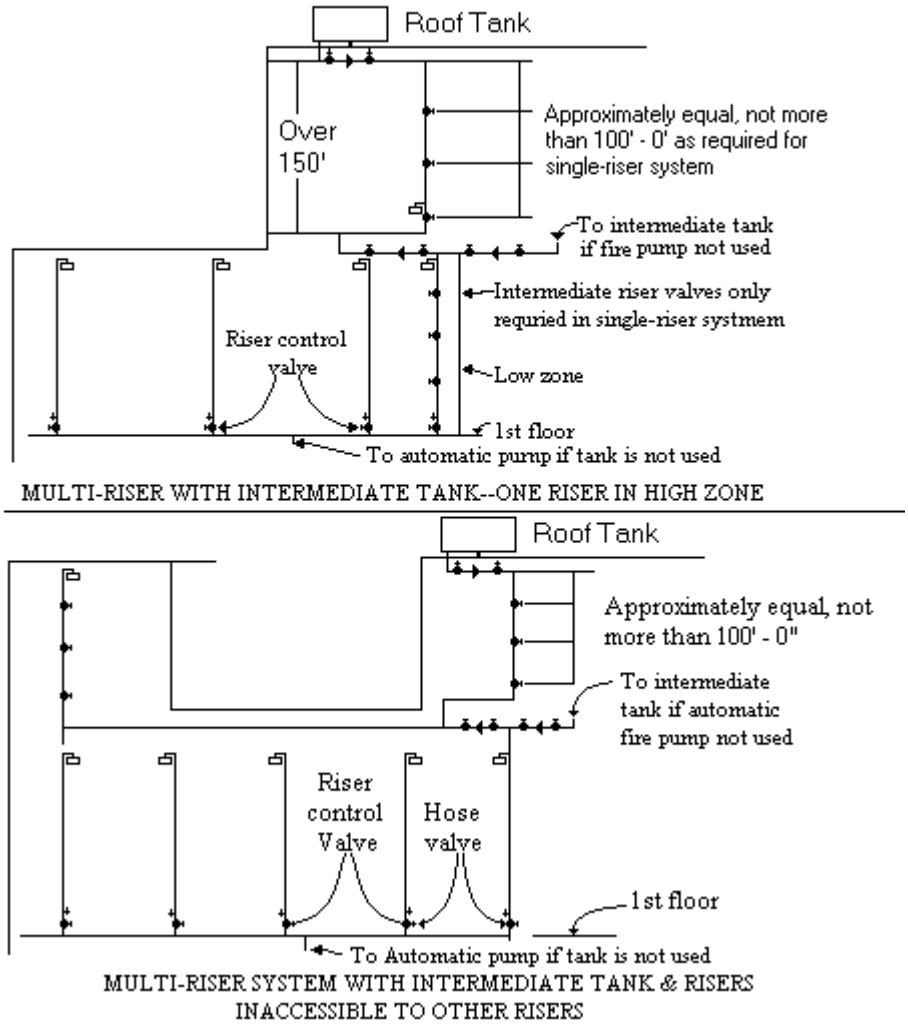
(c) Valves-

(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.

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.

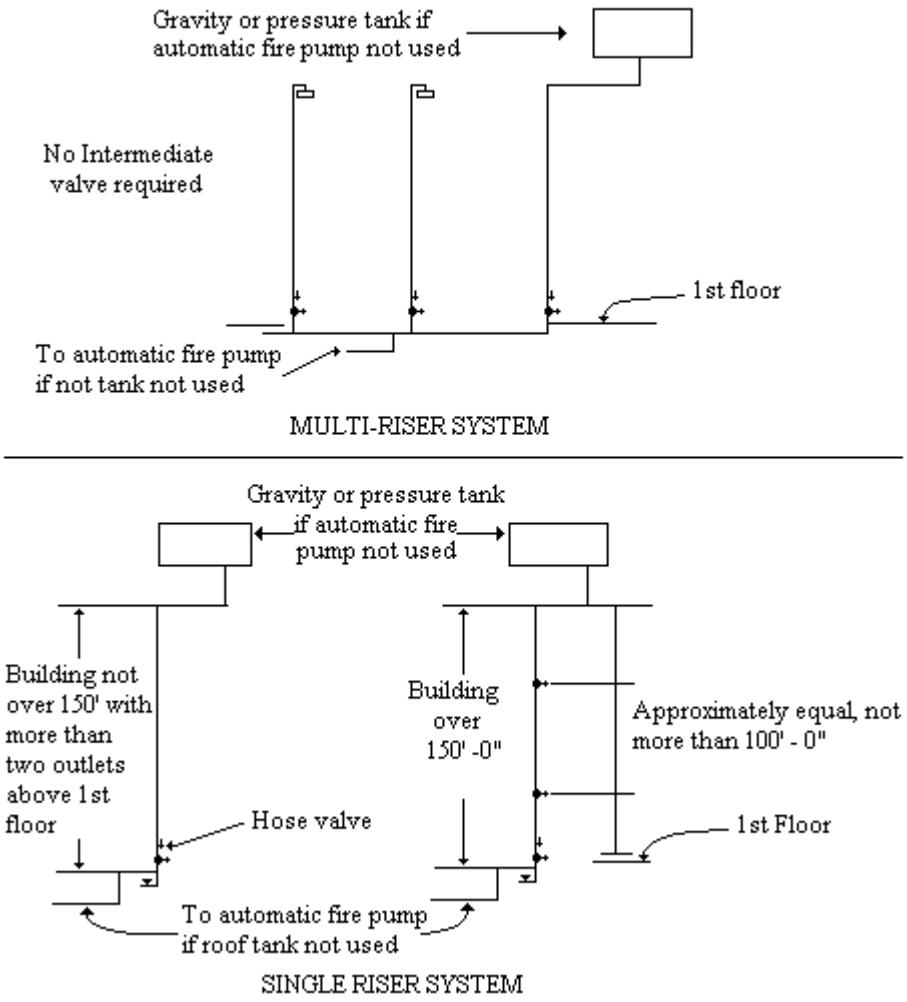
(6) Each valve shall be so designed and installed as to permit its manual operation at the valve location. Pressure ratings and the name of the manufacturer shall be cast raised or depressed on each valve used in the system.

(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

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 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.
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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 ½ 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 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.

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(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. 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.

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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

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 NFiPA 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 NFiPA 231 and 231C.

***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 NFiPA 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.

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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.

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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^{o} 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^{o} 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.,
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. 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 ½ 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.

3-8 Fittings

Renumber Section 3-8.1.4 to 3-8.1.6

Renumber 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

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/NFiPA 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/NFiPA 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.
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:

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/NFiPA 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

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/NFiPA 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/NFiPA 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 /14	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

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.

* * *

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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.

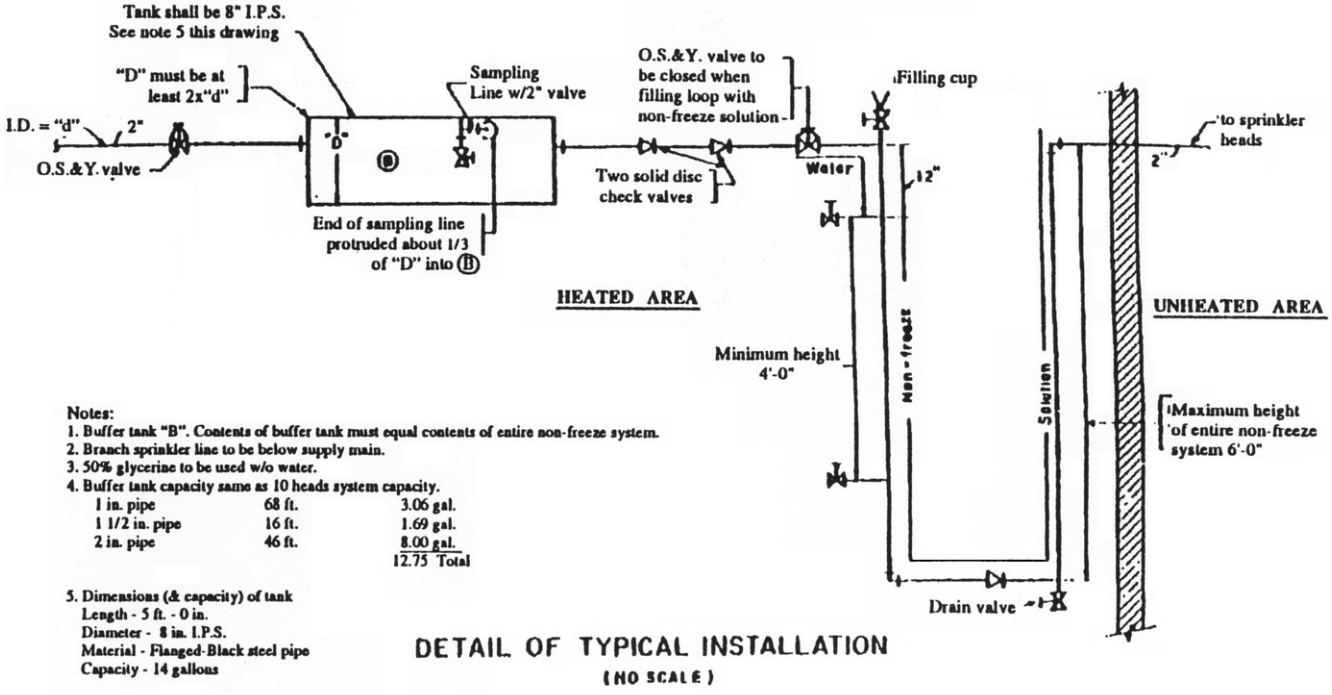

Figure 5-5.4 Arrangement of Supply Piping and Valves

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

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

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

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.

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

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:

(1) Copper; THHN, THWN/THHN, TFFN, TFN, FEP, RHH, RHW-2, XHH, XHHW, minimum 600 volts; 90 C; for installation i n 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, C02 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.

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.
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(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.
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6. Fire Alarm System Control Boards. -

(a) Supervising circuit. -

(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

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, hut 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

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 automaticfire 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.
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(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.

(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.

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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.

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.
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***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.

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.

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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

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, or 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, C02 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.

(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 dover 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.

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 sil ence 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.

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

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

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, C02 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

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

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.

(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

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

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

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, C02 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 d, 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. -

(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. -

(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 l y 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

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.

(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. -

(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/NFiPA 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

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"*

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 that 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.

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 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

[**] **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

[†] **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. 221-987-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

[***] **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 RS-18
ELEVATORS AND CONVEYORS

*LIST OF REFERENCED NATIONAL STANDARDS

ANSI/ASME A17.1	Safety Code for Elevators and Escalators and Supplements A17.1a-1997 as Modified	1996
ANSI A117.1	American National Standard for Buildings and Facilities Providing Accessibility and Usability for Physically Handicapped People as Modified	1986
ANSI B153.1	Safety Requirements for the Construction, Care and Use of Automobile Lifts	1981
	FS00-L-360D Motor Vehicle Lifts	1987
ANSI/ASME MH14.1	Loading Dock Levelers and Dockboards	1987
]ANSI/ASME B20.1	Safety Standards for Conveyors and Related Equipment	1987
ANSI A10.4	Safety Requirements for Personal Hoists	1981
ANSI/ASME A90.1	Safety Standard for Belt Manlifts	1985
ANSI B77.1	Safety Requirements for Aerial Passenger Tramways and Supplements B77.1a-86 and B77.1b-88	1982
ANSI/ASTM F698	Standard Specification for Physical Information to be Provided for Amusement Rides and Devices as modified	1988
**ASNT/SNT-TC-1A	American Society for Nondestructive Testing Certification/ Qualification Recommended Practice in NDT	1992
**ASTM 3.03	Standards for Non-destructive Testing	1995
**ASTM F770	Practice for Operation Procedures for Amusement Rides and Devices	1988
**ASTM F846	Guide for Testing Performance of Amusement Rides and Devices	1992
**ASTM F853	Practice for Maintenance Procedures for Amusement and Devices	1991

DOB 1-16-03; 5-22-95; 11-91 BCR; 678-85 BCR; 98-83 BCR
****DOB 3-8-96***

† REFERENCE STANDARD RS 18-1

ANSI/ASME A17.1-1996 Safety Code for Elevators and Escalators and Supplement A17.1a-1997 as Modified.

Wherever in such Code reference is made to the National Electrical Code ANSI/NFPA NO. 70, substitute New York City Electrical code, Rules and Regulations of the Bureau of Electrical Control of the Department of Buildings and its Advisory Board
Wherever in such Code reference is made to the local Building Code, or model building code, substitute New York City Building Code.
Wherever in such Code reference is made to ASME A17.3, Safety Code for Existing Elevators and Escalators, substitute Article 2 of Subchapter 18 of such chapter.

Modifications.- The provisions of ANSI/ASME A17.1-1996 and Supplement A17.1a-1997 shall be subject to the following modifications. The section numbers are from that standard.
§1. Add or amend the following definitions to
Introduction-Section 3 - Definitions:
(i) Amend the definition designated level to read as follows:
Designated level.-The [main] street floor or other level that best serves the needs of emergency personnel for fire fighting or rescue purposes (applicable to Rule 211.3).
(ii) Add the definition elevator classification between elevator and freight elevator to read as follows:
Elevator Classification.- Elevator is classified as freight or passenger.
(iii) Add the definition elevator, service car between elevator, rooftop and elevator, shipboard to read as follows:
Elevator, Service Car.- A passenger or freight elevator located in an Interim Multiple Dwelling registered with the Loft Board, in accordance with Article 7-C of the Multiple Dwelling Law.
(iv) Add the definition hospital emergency service between hoistway gate and hydraulic elevator to read as follows:
Hospital Emergency Service.- A special operating control function that may be provided for elevators in a building classified in occupancy group H-2 (Hospital) or other applicable medical facility used to transport patient in a life or death situation.
(v) Amend subdivisions a and b of the definition "installation placed out of service" to read as follows:
Installation placed out of service.- An installation whose power feed lines have been disconnected from the mainline disconnect switch and;
(a) an electric elevator, dumbwaiter, sidewalk elevator or material lift whose suspension ropes have been removed, whose car and counterweight rest at the bottom of the hoistway, and whose hoistway doors have been permanently barricaded or sealed in the closed position on the hoistway side;
(b) a hydraulic elevator, dumbwaiter, sidewalk elevator or material lift whose car rests at the bottom of the hoistway; whose pressure piping has been disassembled and a section removed from the premises; whose hoistway doors have been permanently barricaded or sealed in the closed position on the hoistway side; suspension ropes removed and

counterweights, if provided, landed at the bottom of the hoistway
(c) an escalator or moving walk whose entrances have been permanently barricaded.
(vi) Add the definition patient elevator between passenger elevator and penetrate a floor to read as follows:
Patient Elevator.- An elevator located in a building classified in occupancy group H-2 (hospital) reserved for the "sole" use of vertical transportation of non-ambulatory patients who are incapable of self-preservation because of age, physical or mental disability. Hospital staff or other passengers transporting patient are permitted to ride with the patient. Such elevators must be operated by a designated attendant and shall meet the requirements of rules 211.4 and 211.5(c) of this reference standard.
(vii) Add the definition platform guard (toe guard or apron) between pit elevator and plunger (ram) to read as follows:
Platform Guard (Toe Guard or Apron).- A section of sheet metal the full width of the door opening, securely attached to the car sill and extending downward, protecting the landing zone.
(viii) Delete the definition of private residence and substitute the following:
Private Residence.- A building in occupancy group J-3 except group home as defined in Section 27-266 of article eleven of subchapter three of this chapter.
(ix) Add the definition sky lobby between skirt, escalator and slack-rope switch to read as follows:
Sky Lobby.- The lowest landing of an elevator or a group of elevators located above the street level.
(x) Add the definition smoke hole between slope, moving walk and solid state device to read as follows:
Smoke Hole.- An opening for an elevator hoistway venting in the elevator machine room floor at the top of the elevator hoistway(s).
(xi) Add the definition zero clearance vestibule after yield strength to read as follows:
Zero Clearance Vestibule.- A space on the elevator lobby between the exterior of hoistway door and the security door attached to the elevator hoistway.
§2 Delete and replace subdivision d of rule 100.1 to read as follows:
100.1d Multiple Hoistways.
(1) Not more than three (3) elevators shall be located in buildings with a single hoistway.
(2) Not more than four (4) elevators shall be located in a single hoistway in buildings with more than one (1) hoistway.
(3) Low rise, mid rise and high rise elevators shall be located in separate hoistways.
§3 Amend sub division d of rule 100.3 to read as follows:
100.3d Construction of Floors.- Floors [may] shall be either of concrete, or [may be] of metal construction [with or] without perforations. [Metal floors shall conform to the following:
(1) If of bar-type grating, the openings between bars shall reject a ball ¾ in. (19mm) in diameter.
(2) If of perforated sheet metal or of fabricated openwork construction, the openings shall reject a ball 1in. (25mm) in diameter.]
§4. Delete and replace rule 100.4 to read as follows:
Rule 100.4 Control of Smoke and Hot Gases.
Hoistways of elevators shall be provided with means to prevent the accumulation of smoke and hot gases in case of fire by any one of the following:
100.4a Vents in the hoistway enclosures.
(1) Location of Vents:
(a) In the side of the hoistway enclosure below the elevator machine room floor or in the roof of the hoistway, and shall be open either directly to the outer air or through non-combustible ducts to the outer air.
(b) In the wall or roof of an overhead elevator machine room through the smoke hole in the top of the elevator hoistway and shall be vented to the outer air through non-combustible ducts.
(2) Area of Vents.- The area of vents in hoistway or elevator machine room and area of smoke hole shall be not less than three and one-half (3½) percent of the area of the hoistway nor less than three (3) square feet for each elevator car, whichever is greater, with the following vent types:
(a) Open Vents.- of the total required vent area, not less than one-third ($^1/_3$) shall be permanently open or with openable hinged damper. Smoke hole shall be permanently open.
(b) Closed Vents.- The two-third ($^2/_3$) closed portion of the required vent area either in the hoistway enclosure or in the elevator machine room may consist of windows or skylights glazed with plain glass not more than one-eighth ($^1/_8$) inch thick. A closed damper that will open upon the activation of a smoke detector placed at the top of the hoistway shall be considered closed vents.
100.4b Mechanical ventilation of the hoistway enclosure.- In all elevator and dumbwaiter hoistways where the venting of elevator and dumbwaiter hoistway is by mechanical means, there shall be provided a system of a mechanical ventilation of sufficient capacity to exhaust at least twelve (12) air changes per hour of the volume of such hoistways through a roof or an approved location on an exterior wall other than the lot line wall, and shall be subject to the following:
(1) The smoke detector shall be placed at the top of these hoistways to activate mechanical ventilation system.
(2) A mechanical ventilation system serving these hoistways shall not pass through the overnight sleeping areas of hotel, apartment house, hospital, or similar building.
(3) A manual control to shut down the mechanical ventilation system shall be provided in or near the elevator control panel at the designated level.
100.4c Air pressurization of hoistway enclosure.- where air pressurization of the hoistway is utilized as a means of smoke and hot gas control, the air shall not be introduced into the hoistway in such a manner as to cause erratic operation by impingement on landing or car door equipment, traveling cables, selector tapes, governor

ropes, compensating ropes, and other components sensitive to excess movement or deflection.

100.4d The Commissioner may accept alternate means to prevent the accumulation of smoke and hot gases in the hoistways of elevators in case of fire.

§5. Amend first paragraph of rule 100.5 to read as follows:

Rule 100.5 Windows and Skylights.

Windows in the walls and skylights at the top of hoistway enclosures are prohibited.

§6 Add subparagraph e to paragraph 1 of subdivision d of rule 101.3 to read as follows:

e. Machine room doors shall be labeled "**ELEVATOR MACHINE ROOM"** with letters not less than two (2) inches (51 mm) high.

§7 Amend subdivision a of rule 101.5 to read as follows:

101.5a control switch shall be located on the lock-jamb side of the access door.

§8. Amend subdivision c of rule 101.5 to read as follows:

101.5c Receptacle.- A duplex receptacle rated at not less than 15A, 120V with ground fault interrupt shall be provided in each machine room and machinery space.

§9. Amend the second paragraph of rule 102.1 to read as follows:

Rule 102.1 Installation of Electrical Equipment and Wiring In Hoistways and Machine Rooms.

Only such electrical wiring, raceways, and cables used directly in connection with the elevator, including wiring for signs, for communication with the car, for lighting, heating, air conditioning, and ventilating the car, for fire detecting systems, for pit sump pumps, and for heating and lighting the hoistway and/or the machine room and electrical wiring permitted by article one of subchapter eighteen of chapter 1 of title 27 of the administrative code, may be installed inside the hoistway and/or the machine room.

§10. Amend rule 103.1 to read as follows:

Rule 103.1 Location of Counterweights.

Counterweights shall be located in the hoistway of the elevator that they serve [or in a remote hoistway, subject to the limitations and requirements of Rule 103.3].

§11. Amend the title of rule 103.3 to read as follows:

Rule 103.3 Existing Remote Counterweight Hoistways.

§12. Add new paragraph 5 to subdivision b of rule 106.1 to read as follows:

(5) Walk-in pits with floors located at the same elevation as the adjacent floor, access landing will not require separate drainage or sump pumps.

§13. Amend paragraph 1 of subdivision d of rule 106.1 to read as follows:

(1) Access shall be by means of the lowest hoistway door or by means of a separate access door located at the level of pit floor.

§14. Add new subparagraphs d and e to paragraph 4 of such subdivision of such rule to read as follows:

(d) If at any point of travel including the car under full compressed buffer, any equipment attached to the car extends within the hoistway space in the pit, the pit door shall be equipped with door electric contact which shall cause the electric power to be removed from the elevator driving-machine motor and brake.

(e) If the door electric contact is installed a sign **"WARNING- Opening of the Pit Door will Stop Elevator"** is attached on the outside of the door.

§15. Amend paragraph 4 of subdivision e of rule 106.1 to read as follows:

(4) A GFI duplex receptacle rated at not less than 15A, 120V shall be provided.

§16. Amend the first paragraph of rule 110.1 to read as follows:

Rule 110.1 Entrances and Emergency Doors Required

All elevator hoistway-landing openings shall be provided with entrances that shall guard the full height and width of the openings. Entrances for passenger elevators shall not be less than 6 ft 8 in. (2032mm) in height and [32 in. (813 mm)] 36 in. (914 mm) in width.

§17. Delete subdivision a of rule 110.1 and replace it with the following:

(a) The clear door opening shall be at least thirty-six (36) inches (914 mm) wide and six (6) feet six (6) inches (1981 mm) high. For floor plan of elevator cars, see subsection 4.10.9 of Section 216.

§18 Delete subparagraph c of paragraph 1 of subdivision a, and paragraph 3 of subdivision b of rule 110.2.

§19. Amend rule 110.6 to read as follows:

Rule 110.6 Opening of Hoistway Doors From Hoistway Side

Passenger elevator hoistway doors shall be so arranged that they may be opened by hand from within the elevator car only when the car is within the unlocking zone{see Rule 111.[12] 5 (c)}, except at an entrance locked out of service.

Means shall not be provided for locking out of service the doors by padlocks or any other physical locking devices at the following landings:

(a) top terminal landing;

(b) bottom terminal landing;

(c) for elevators equipped with Phase I firefighters' service, the designated and [alternate] sky lobby landings shall not be locked out of service when Phase I is effective;

(d) for elevators equipped with Phase II firefighters' service, no landing shall be locked out of service when Phase II is effective;

(e) consecutive vacant floors;

(f) main lobby street floor.

Locking devices electrically inter-connected into the firemen's service key are permitted.

Automatic fire doors, the functioning of which is dependent on the action of heat, shall not lock any elevator hoistway door so that it cannot be opened manually from inside the hoistway, nor shall such doors lock any exit leading from any elevator hoistway door to the outside of the building.

Handles or other means provided for operation of manually operated doors shall be so located that it is not necessary to reach the back of any panel, jamb, or sash to operate them.

§20. Add new subdivisions a, b and c to such rule to read as follows:

110.6a Elevator Landings Provided with Zero Clearance Vestibule.- Elevator landings provided with zero clearance vestibule (not to exceed six(6) inches from the elevator hoistway door) are permissible only when locking devices accessible from the car are installed exclusively on the door that separates the zero clearance vestibule from the occupied floor space.

110.6b Elevator Landing on Floors Other than Designated Level Provided with a Vestibule.- Locking devices at the vestibule will be permitted under any one of the following:

(1) A red telephone is installed in the vestibule near the elevator doors in the elevator lobby to communicate with the main lobby fire command station or building manager's office or to central service station when the building is not attended. A sign shall be posted near the telephone. The sign shall read **"In Case of Fire or Other Emergency, Use This Phone to Contact Lobby or Building Manager or Central Service Station".**

(2) The locking devices on the vestibule door leading to an exit are released upon the activation of any detection or signaling devices or power failure and are approved as fail-safe meeting the requirements of RS17-3A and RS17-3B of such appendix.

(3) At least one exit stair is located within the vestibule.

110.6c Elevator Door Locking on Consecutive Vacant Floors If elevator doors on consecutive vacant floors are to be locked, the locking devices shall be exclusively on vestibule doors meeting the requirements of Rule 110.6a.

§21. Amend paragraphs 1 and 2 of subdivision a of rule 110.7 to read as follows:

(1) The area of any single vision panel shall not be less than [24 in² (0.016 m²)] twelve (12) in² (0.008 m²), and the total area of one or more panels in any hoistway door shall be not more than [80 in² (0.051 m²)] forty (40) in² (0.026 m²).

(2) Each clear panel opening shall reject a ball [6 in (152mm)] four (4) inches (102 mm) in diameter.

§22. Delete subparagraph b of paragraph 4 of such subdivision of such rule.

§23 Add word tools at the end of subparagraph b of paragraph 8 of, and new paragraph 9 to such subdivision of such rule to read as follows:

(9) Vision panels shall be protected in accordance with the provisions of Rule 204.2e(6).

§24. Delete subdivision f of rule 110.11 and re-adopt to read as follows:

(1) Bottom Guides.- Bottom guides shall conform to the following:

(a) The bottom of each panel shall be guided by two or more members.

(b) Guide members shall be securely fastened.

(c) The guide members and any reinforcements or guards shall engage the corresponding member by no less than one forth (¼) inch (6.3mm).

§25. Delete paragraph 6 of subdivision c and subdivision e of rule 110.13.

§26 Add paragraph 6 to subdivision a of rule 110.15 to read a s follows

(6) BS&A or MEA label shall be provided for the entire entrance assembly where required by this rule.

§27 Amend title of section 111 to read as follows:

SECTION 111
HOISTWAY-DOOR LOCKING DEVICES AND ELECTRIC CONTACTS, [AND] HOISTWAY ACCESS SWITCHES AND ELEVATOR PARKING DEVICES

§28. Amend the first sentence of subdivision d of rule 111.2 to read as follows: new and replacement Interlocks shall conform to the following:

111.2 d General Design Requirements.- Both new and replacement Interlocks shall conform to the following requirements:

§29 Delete subparagraphs d and e of paragraph 4 of and add new paragraph 8 to such subdivision of such rule to read as follows:

(8) Interlocks shall be MEA accepted or BS&A approved.

§30 Delete rule 111.3 in its entirety.

§31. Amend paragraph 2 of subdivision c of rule 111.4 to read as follows:

The certifying agency's name, [or] date of approval and identifying number or symbol;

§32. Add rule 111.8 to read as follows:

Rule 111.8 Elevator Parking Device

111.8a Where Required and Location

(1) An elevator parking device shall be provided at one landing if:

(a) the doors are not automatically unlocked when the car is within the unlocking zone; or

(b) the doors are not openable from the landing by a door-open button or floor button.

(2) Parking devices may be provided at other landings.

(3) This device shall be located at a height not greater than 6ft. 11 in.(2108 mm) above floor

111.8b General Design Requirements.- Parking devices shall conform to the following requirements:

(1) They shall be mechanically or electrically operated.

(2) They shall be designed and installed so that friction or sticking or breaking of any spring used in the device will not permit opening or unlocking a door when the car is outside the landing zone of that floor.

(3) Springs, where used, shall be of the restrained compression type which will prevent separation of the parts in case the spring breaks.

§33. Add rule 111.9 to read as follows:

Rule 111.9 Access to Hoistway for Inspection, Maintenance or Repairs

Access means conforming to the requirements of either Rule 111.6a or 111.7a shall be provided at one upper landing to permit access to top of car, and at the lowest landing if this landing is the normal point of access to the pit.

§34. Add rule 111.10 to read as follows:

Rule 111.10 Devices for Making Inoperative Hoistway-

Door Interlocks or Car-Door or Gate Contacts

Devices other than those specified in Rule 111.7 and Rule 210,1e shall not be installed to render inoperative hoistway-door interlocks or car-door or gate electric contacts (also see Rule 1203.4). Both new and existing elevators shall comply with the provisions of this rule.

§35. Add rule 112.7 to read as follows:

Rule 112.7 Power Operated Horizontal Opening Gates

Horizontal power operated gates shall not be permitted on automatic passenger elevators except in private residence elevators.

§36. Add new paragraphs 1 and 2 to subdivision f of rule 201.4 to read as follows:

(1) A fixed inclined ladder shall be provided where the top of the buffer cylinder is over five (5) feet in height above the pit floor.

(2) A fixed vertical or inclined ladder fitted with an inspection and maintenance platform with guard rails as necessary shall be provided where the top the car buffer cylinder is over seven (7) feet from the pit floor.

§37. Add the new sentence to the first paragraph of rule 202.4 to read as follows:

Rule 202.4 Compensating Chain or Rope Fastenings

In suspending chains from the frames, provision shall be made for overtravel by looping the chains on "S" hooks fastened to the frames. Compensating chains or ropes shall be fastened to the counterweight frame directly or to a bracket fastened to the frame and shall not be fastened to the tie rods.

§38. Add rule 202.5 to read as follows:

Rule 202.5 Counterweight Material

Counterweight material shall be only steel, iron or lead having a minimum melting temperature of 620 degrees F.

§39. Add new paragraph to subdivision f of rule 204.1 to read as follows:

A guardrail shall be provided where the space between the car enclosure and the nearest wall surface exceeds eight (8) inches. This rail shall be level with the top of the crosshead in the area of the enclosure roof where the top emergency exits are located. In no case shall the guardrail be less than twenty four (24) inches above the car top.

§40. Amend paragraph 1 and subparagraph d of such paragraph and add new subparagraphs e, f and g to such paragraph of subdivision i of such rule to read as follows:

(1) Apparatus or equipment not used in conjunction with the function or use of the elevator shall not be installed inside of any elevator car and permanently installed freight handling equipment in residential passenger elevators shall be prohibited except as follows:

(d) picture frames, graphic display boards, plaques, and other similar visual displays including one (1) advertising sign in commercial buildings limited to three and one half (3½) square feet in area shall be mounted to withstand the required elevator tests without damage. All edges shall be beveled or rounded. The material shall conform to the requirements of Rule 204.1b and 204.2a. When attached to the car wall less than 7 ft above the floor, projections from the car wall, excluding support rails, shall not be greater than 1½ in (38 mm).

(e) small directories and signs relating to building operation including "No Smoking" signs are permitted.

(f) mirrors in cars in multiple dwellings shall be located to permit a view of the inside by persons entering the car as per Section 27-987(e) of article one of subchapter eighteen of such chapter.

(g) an inspection certificate issued by the commissioner shall be posted as per Section 27-1004 of article four of such subchapter of this chapter.

§41 Add the following new paragraph to subparagraph f of paragraph 2 of subdivision j of such rule to read as follows:

Automatic operation elevators with side emergency exit located in multiple dwelling shall be provided with a tumbler type lock of at least 5-pin type in addition to the lock specified in this rule.

§42. Amend subdivision a of rule 204.2 to read as follows:

204.2a Material for Car Enclosures, Enclosure Linings, and Floor Coverings.- All materials exposed to the car interior and the hoistway shall be metal, laminated glass {Rule 204.1h(3)(a)}, or shall conform to the following.

(1) Materials in their end use configuration, other than those covered by Rules 204.2a(2), and (3), and (4), shall conform to the following requirements, based on the tests conducted in accordance with the requirements of ASTM E 84, UL 723,or NFPA 255:

(a) flame spread [index] rating of 0 to [75] 50;

(b) smoke development of 0 to [450.] 100;

(c) toxicity shall meet the requirements of Section 27-348(e) of the Building Code.

(2) [Napped, tufted, woven, looped, and similar materials in their end use configuration on car enclosure walls shall conform to the requirements of Section 1104. The enclosure walls to which this material is attached shall conform to the requirements of Rule 204.2a(1).] Materials for insulating, sound deadening or decorative purposes may be used for lining enclosures if firmly bonded flat to the enclosure without intervening air spaces. Such materials shall not be padded or tufted, shall be Class A interior finish pursuant to Section 27-348(b) of the Building Code and shall have a smoke development rating of 0 to 25 pursuant to Section 27-348(d) of the Building Code.

(3) Padded protective linings, for temporary use in passenger cars during the handling of freight, shall be of materials conforming to [either] Rule 204.2a(1) [or (2)]. The protective lining shall clear the floor by not less than 4 in. (102 mm).

(4) Floor covering, underlayment, and its adhesive shall [have a critical radiant flux of not less than 0.45 W/cm2 as measured by ASTM E 648.] meet the requirements of section 27-351(d) of the Building Code.

(5) Handrails, operating devices, ventilating devices, signal fixtures, audio and visual communication devices, and their housings are not required to conform to the requirements of Rule 204.2a(1) through (4).

§43. Amend paragraph 1 and add new paragraph 6 to subdivision e of rule 204.2 to read as follows:

(1) be of a total area of not more than [144 in² (0.093 m²),] 72 in² (0.047 m²), and contain no single glass panel having a width exceeding [6 in. (152 mm)] 4 in. (101 mm);

* * *

(6) be protected by protective grills made of number 16 gage stainless or galvanized steel in accordance with the following specifications:

(a) Grills shall be sized to fit within or over the vision panel frame and completely cover the vision panel opening in both the elevator car doors and hoistway doors.

(b) Grills and vision panel frames shall be secured by means of non-reversible screws or other tamper proof fasteners.

(c) Grills shall contain openings that shall not be larger than ¾ inch by ¾ inch or ¾ inch in diameter. Such openings shall be spaced at one (1) inch center to center.

(d) All cut edges shall be deburred.

(e) The provisions of subparagraph (6) shall apply to both new and existing passenger cars. Requirements for such grills may be waived if certification is submitted that said elevator is operated manually or twenty-four (24) hour doorman service is provided. A security guard shall not be considered doorman service.

(f) For the purposes of this subparagraph, a vandal resistant one-quarter (¼) inch polycarbonate sheet, such as Lexan, in two (2) layers, one (1) on each side of the required wire glass, may be used in lieu of the metal protective.

§44. Amend paragraph 2 of subdivision h of rule 204.4 to read as follows:

(2) Gates shall be constructed of wood only for private residence elevators [or] and of metal, and shall be of a design which shall reject a ball 2 in. (51 mm) in diameter.

§45 Amend paragraphs 1,2 and 3 of subdivision m of such rule to read as follows:

(1) for horizontally sliding doors or gates, when the clear open space between the leading edge of the door or gate and the nearest of the jamb does not exceed [2 in. (51 mm)] 1 in. (25 mm)[, except as specified in Rule 204.4m(4)];

(2) for vertically sliding counterweighted doors or gates, when the clear open space between the leading edge of the door or gate and the car platform sill does not exceed [2 in. (51 mm) 1 in. (25 mm);

(3) for horizontally sliding center-opening doors, or vertically sliding biparting counterbalanced doors, or when the door panels are within [2 in. (51) mm] 1 in. (25 mm) of contact with each other[, except as specified in Rule 204.4m(4).].

§46. Delete paragraph 4 of such subdivision of such rule.

§47. Amend the title of subdivision c of rule 204.5 to read as follows:

204.5c Vertically Sliding Doors [or Gates].

§48. Amend paragraph 4 of such subdivision of such rule to read as follows:

(4) Each elevator shall be provided with [an] a guarded electric light and convenience outlet fixture on the car top and under each elevator car platform for inspection and maintenance purposes.

§49. Amend the opening paragraph of rule 205.14 to read as follows

A metal plate shall be securely attached to each safety device so as to be readily visible, and shall be marked in a legible and permanent manner with letters and figures not less than ¼ in. (6.3 mm) in height indicating the following:

§50 Amend rule 208.10 to read as follows:

Rule 208.10 Numbering of Driving Machines

A New York City designated elevator device number is assigned by the Elevator Division of the New York City Department of Buildings to each driving machine in every machine room. Such numbers shall be engraved into the metal tag in block type with a minimum of ¼ in. height and securely attached in a permanent manner to the driving machine, controller, MG set or drive unit and the disconnecting means. In addition, [W] when the machinery of more than one elevator is in a machine room, each driving machine shall be assigned a different number which shall be painted on or securely attached to the driving machine. (See also Rule 211.9.)

§51. Amend rule 208.11 to read as follows:

Rule 208.11 Means for Inspection of Gears

Each gear case of geared machines shall have access to permit inspection of the contact surfaces of the gears. [Such access need not provide a direct view of all gears, but shall be located and sized adequately to allow access by fiber optic or similar visual inspection instrumentation.]

§52 Add paragraph 3 to subdivision b of rule 209.3 to read as follows:

(3) Final limit switches and bracket shall be permanently secured.

§53 Amend first paragraph of subdivision e of rule 210.2 and add new paragraph 5 to such subdivision of such rule to read as follows:

(e) Emergency Stop Switch.- [An emergency stop switch is prohibited in the car on passenger elevators.] On all [freight] elevators, an emergency stop switch shall be provided in the car, and located in or adjacent to each car operating panel. When opened, this switch shall cause the electric power to be removed from the elevator driving machine motor and brake.

* * *

(5) cause the alarm bells to sound as required by Rule 211.1 when activated in elevators that are operated at any time without a designated in-car operator.

§54 Amend subdivision b of rule 210.4 to read as follows:

(b) Electrical equipment shall [be certified to] meet the requirements of CSA B44.1/ASME A17.5.

§55. Add new subdivision d to rule 210.8 to read as follows:

(d) the power supply line disconnect switch of direct current elevators having rheostat control is opened.

§56. Delete rule 210.14.

§57 Delete rule 210.15.

§58. Add the following sentence to the end of first

paragraph of subdivision b of rule 211.1.
In the event that this service is disconnected, the emergency service shall notify the Commissioner promptly of the date of such discontinuance. In institutional buildings, the required telephone shall provide communication with building personnel.
§59. Delete subdivision c of such rule.
§60. Amend subdivision a of rule 211.3 to read as follows:

211.3a Phase I Emergency Recall Operation.- A [three] two-position key-operated switch shall be provided [only] at the designated level and at the sky lobby level when provided for each single elevator or for each group of elevators. The [three] two-position switch shall be marked ["BYPASS," "OFF," and "ON"] "NORMAL," and "FIREMAN SERVICE" [(in that order) with the "OFF" position at the center position]. The [three] two-position switch shall be located in the lobby [within sight of the elevator or all elevators in that group] call button fixture or in a separate fixture which shall be located within four (4) feet from the lobby call button fixture and not exceeding six (6) feet above the floor level and shall not be located behind a locked door or cover. The commissioner with concurrence of the fire commissioner may allow [A] an additional two-position [("OFF" and "ON" in that order)] ("NORMAL" and "FIREMAN SERVICE" key-operated switch [shall be permitted at a central control station for fire department operations] at another location. [The switches shall be rotated clockwise to go from the "OFF" to "ON" position.] All keys shall be removable [only in the "OFF" and "ON"] from any position[s].
No device, other than Phase I switch(es) [or the fire alarm initiating device at the elevator floors] , the smoke detectors in the elevator lobbies, machine room, or hoistway (Rule 211.3b1), or the waterflow alarm (Rule 211.b2), shall initiate Phase I operation [(see ANSI/NFPA 72, definition for initiating device)].
Normal elevator service shall be provided and the operation from the smoke detectors required by Rule 211.3b(1) or the waterflow alarm Rule 211.3b(2) shall be functional when Phase I switches are in the ["OFF"] "NORMAL" position [, except as specified in Rule 211.3a(10)].
[When the designated level three-position switch is in the "BYPASS" position, normal elevator service shall be restored regardless of the status of the smoke detectors required by Rule 211.3b.]
When [three-position switch or two-position] a switch [, when provided,] is in the ["ON"] "FIREMAN SERVICE" position:
(1) All cars controlled by this switch that are on automatic service shall return nonstop to the designated or sky lobby level and power-operated doors shall open and remain open. On cars with two entrances, if both entrances can be opened at the designated or sky lobby level, the doors serving the lobby where the [three] two-position Phase I switch is located shall open and remain open.
(2) A car traveling away from the designated or sky lobby level shall reverse at or before the next available landing without opening its doors.
(3) A car stopped at a landing shall have the in-car emergency stop switch [or in-car stop switch] rendered inoperative as soon as the car moves away from the landing. A moving car shall have the in-car emergency stop switch [or in-car stop switch] rendered inoperative without delay. Once the in-car emergency stop switch [or in-car stop switch] has been rendered inoperative, it shall remain inoperative while the car is on Phase I operation. All other stop switches required by Rule 210.2 shall remain operative.
(4) A car standing at a landing other than the designated or sky lobby level, with the doors open and the in-car emergency stop switch [or in-car stop switch] in the run position, shall conform to the following:
(a) Elevators having automatic power-operated horizontally sliding doors shall close the doors without delay and proceed to the designated or sky lobby level.
(b) Elevators having automatic power-operated vertically sliding doors provided with automatic or momentary pressure closing operation per Rule 112.3d shall have the closing sequence initiated without delay in accordance with Rules 112.3d(1), (2), (3), and (5), and the car shall proceed to the designated or sky lobby level.
(c) Elevators having power-operated doors provided with continuous pressure closing operation per Rule 112.3b or elevators having manual doors, shall be provided with a visual and audible signal system to alert an operator to close the doors and shall, when the doors are closed, conform to the requirements of Rule 211.3a. Sequence operation, if provided, shall remain effective.
(5) Door reopening devices, for power-operated doors, which are sensitive to smoke or flame shall be rendered inoperative without delay. Door reopening devices not sensitive to smoke or flame (e. g., mechanically actuated devices) are permitted to remain operative. Door closing for power-operated doors shall conform to the requirements of Rule 112.5.
(6) All car and corridor call buttons shall be rendered inoperative. All call registered lights and directional lanterns shall be extinguished and remain inoperative. Car position indicators, where provided, shall remain in service. Hall position indicators, where provided, shall be extinguished and remain inoperative except at the designated or sky lobby level and the central control station, where they shall remain in service for fire department operations.
[(7) Where provided on installations with vertical slide doors, corridor door open and corridor door close buttons shall remain operative.]
[(8)](7) All cars shall be provided with an illuminated visual and audible signal system which shall be activated to alert the passengers that the car is returning nonstop to the designated or sky lobby level. [The visual graphic shall be shown in Fig. 211.3a.] The signals shall remain activated until the car has returned to the designated or sky lobby level.
[(9)](8) A car stopped at a landing shall have the in-car door open button rendered inoperative as soon as the car moves away from the landing. A moving car shall have the

in-car door open button rendered inoperative without delay. Once the in-car door open button has been rendered inoperative, it shall remain inoperative until the car has returned to the designated or sky lobby level.

[(10) If an additional two-position Phase I switch is provided, it shall not affect Phase I operation if the designated-level smoke detector [Rule 211.3b(2)] has been activated

(11) The "BYPASS" position on the three-position Phase I switch shall not restore the elevator to normal service if the two-position Phase I switch is in the "ON" position.]

§61 Delete subdivision b of rule 211.3 and re-adopt it to read as follows:

211.3b Phase I Fire Alarm Activation

(1) Smoke Detectors.- Except as set forth in subparagraph k of this paragraph, smoke detectors installed in accordance with subparagraphs a,b,c or d shall initiate Phase I emergency recall operation.

(a) In buildings where fire command station is not required or provided, a single smoke detector shall be installed in the ceiling of each elevator landing over the call button on each floor.

(b) In buildings where fire command station is required or provided, either of the following shall apply:

(1) An analog addressable smoke detector employing alarm verification shall be installed in the ceiling of each elevator landing over the call button on each floor or

(2) Two (2) smoke detectors for cross-zoning shall be installed in the ceiling of each elevator landing on each floor and spaced as follows:

(i) in elevator landing containing one (1) or two (2) elevators, the distance between smoke detectors shall be the width of the hoistway(s) but not greater than ten (10) feet.

(ii) in elevator landing containing three (3) or more elevators, the distance between smoke detectors shall be the distance between the centerlines of the end elevators but not greater than twenty (20) feet.

(c)(1) In associated elevator machine rooms of the buildings of subparagraph a above, a smoke detector shall be installed.

(2) In associated elevator machine rooms of the buildings of paragraph b above, either of the following shall be installed:

(i) An analog addressable smoke detector employing alarm verification or

(ii) At least two (2) smoke detectors for cross zoning, spaced twenty (20) feet apart but not closure to the hoistway enclosure walls ¼ distance of the width of the machine room.

(d) A smoke detector shall be installed at top of the hoistway(s) of the buildings classified in occupancy group J-2. Smoke detectors may be installed in any other hoistway and shall be installed in hoistways, which are sprinklered (see Rule 102.2).

(e) Smoke detectors are not required in elevator landings at unenclosed landing which are open to the outside air.

(f)(1) In the buildings of subparagraph a above, where a single smoke detector is installed in the elevator landing, the activation of a smoke detector in any elevator landing, other than the sky lobby shall cause all automatic elevators servicing floor on which the sensing device is activated to return nonstop to the designated or sky lobby level, except as modified by the commissioner.

(2) In the buildings of subparagraph b above, where either an analog addressable smoke detector or two (2) smoke detectors for cross-zoning are installed, the activation of either an analog addressable smoke detector or any one of two smoke detectors for cross-zoning in any elevator lobby shall only annunciate at the fire command station with floor identification. After verification of an alarm condition either from the analog addressable smoke detector or from the first detector of cross-zoning detectors, the completion of delayed time period of an analog addressable smoke detector or the activation of both smoke detectors for cross-zoning in any elevator lobby other than the sky lobby shall cause all automatic elevators servicing floor on which the sensing device is activated to return nonstop to the designated or sky lobby level, except as modified by the commissioner.

(3) In associated machine rooms of item 1 of subparagraph c above, the activation of smoke detector in the elevator machine room shall cause all automatic elevators having any equipment located in that machine room, and any associated elevators of a group automatic operation to return nonstop to the designated or sky lobby level, except as modified by the commissioner.

(4) In associated machine rooms of item 2 of such subparagraph above, where either an analog addressable smoke detector or two (2) smoke detectors for cross-zoning are installed, the activation of either an analog addressable smoke detector or any one of two smoke detectors for cross-zoning in any elevator machine room shall only annunciate at the fire command station with floor identification. After verification of an alarm condition either from the analog addressable smoke detector or from the first detector of cross-zoning detectors, the completion of delayed time period of an analog addressable smoke detector or the activation of both smoke detectors for cross-zoning in any elevator machine room shall cause all automatic elevators having any equipment located in that machine room, and any associated elevators of a group automatic operation to return nonstop to the designated or sky lobby level, except as modified by the commissioner.

(5) The activation of a smoke detector in any elevator hoistway shall cause, in addition to the activation of mechanical ventilation if provided (see Rule 100.4) all automatic elevators having any equipment located in the hoistway and any associated elevators of a group automatic operation, to return nonstop to the designated or sky lobby level.

The operation of this subparagraph shall conform to the requirements of Rule 211.3a.

(g) When the lowest landing of elevators is above the designated level, such as the sky lobby level, the activation of smoke detectors {Rule 211.3b(1)} in the sky lobby level or the activation of the waterflow alarm {Rule 211.3b(2)} on the sky lobby floor shall cause such elevators to return nonstop to a floor two (2) stories above the sky lobby level

or in the absence of a stop at that floor, to the nearest landing above the sky lobby level.

(h) Elevators shall only react to the first smoke detector zone that is activated for that group.

(i)Smoke detectors and/or smoke detector systems shall not be self-resetting.

(j) Activation of smoke detectors to initiate elevator recall shall override any automatic programming for car stops but shall not affect the other elevator safety circuits.

(k) The following buildings shall be exempt from the requirements of this rule:

(1) Buildings classified in occupancy group J-2, except they shall comply with the requirements of Rule 211.3b(1)d.

(2) Buildings classified in occupancy group J-3.

(3) Existing buildings less than 75' in height classified in occupancy group G which have at least one (1) elevator available at all times for immediate use by the fire department and which are in compliance with the fire department 's regulations governing "life safety requirements for schools with students having physical disabilities".

(4) Existing office buildings, one hundred feet or more in height and existing high buildings as defined by Section 27-232 of the Building Code equipped throughout with an automatic sprinkler system including a waterflow alarm.

(2) Sprinkler Waterflow Alarm.- A building equipped throughout with an automatic sprinkler system, a waterflow alarm when activated shall initiate Phase I (Rule 211.3a) emergency recall operation.

§62 Amend subdivision c of rule 211.3 to read as follows:

211.3c Phase II Emergency In-Car Operation.- A three-position (["OFF"] "NORMAL", "HOLD", and ["ON"] "FIREMAN SERVICE" in that order) key-operated switch shall be provided in an operating panel in each car. The switch shall be rotated clockwise to go from the ["OFF"] "NORMAL" to "HOLD" to ["ON"] "FIREMAN SERVICE" position. It shall become effective only when the designated or sky lobby level Phase I switch (Rule 211.3a) is in the ["ON"] "FIREMAN SERVICE" position or a smoke detector (Rule 211.3b(1)) or waterflow alarm (Rule 211.3b(2)) has been activated, and the car has returned to the designated or [alternate] sky lobby level by Phase I operation.

The key shall be removable in [each] "NORMAL" or "HOLD" position. The ["OFF,"] "NORMAL," "HOLD," and ["ON"] "FIREMAN SERVICE" positions shall not change the operation until the car is at a landing with the doors in the normal open position.

(1) When the Phase II switch is in the ["ON"] "FIREMAN SERVICE" position, the elevator shall be on Phase II operation, [for use by trained emergency service personnel only,] and the elevator shall operate as follows:

(a) The elevator shall be operable only by a designated person in the car.

(b) All corridor call buttons and directional lanterns shall remain inoperative. Car position indicators, where provided, shall remain in service. Hall position indicators, where provided, shall remain inoperative except at the designated level, sky lobby level and the central control station, where they shall remain in service for fire department operations.

(c) The opening of power-operated doors shall be controlled only by a continuous pressure door open button. If the button is released prior to the door reaching the normal open position, the doors shall automatically re-close. Rules 112.4(a), 112.3c, and 112.3d do not apply. On cars with two entrances, if both entrances can be opened at the same landing, separate door-open buttons shall be provided for each entrance.

(d) Open power-operated doors shall be closed only by [continuous] momentary pressure on the door close button. [If the button is released prior to the doors reaching the fully closed position, horizontally sliding doors shall automatically reopen and vertically sliding doors shall automatically stop or stop and reopen.] On cars with two entrances, if both entrances can be opened at the same landing, a separate door-close button shall be provided for each entrance.

(e) Opening and closing of power operated car doors or gates which are opposite manual swing or manual slide hoistway doors shall conform to the requirements of Rules 211.3c(1)(c) and (d). Door opening and closing buttons shall be provided in the car operating panel.

(f) [All door] Door reopening devices [shall be] rendered inoperative, per Rule 211.3a(5) shall remain inoperative. Full speed closing is permitted. Corridor door opening and closing buttons, if provided, shall be rendered inoperative.

(g) Every car shall be provided with a button marked "CALL CANCEL" located in the same car operating panel as the Phase II switch, which shall be effective during Phase II operation. When activated, all registered calls shall be canceled and a traveling car shall stop at or before the next available landing.

(h) Floor selection buttons shall be provided in the car to permit travel to all landings served by the car and they shall be operative at all times. Means [to] which prevent the operation of the floor selection buttons or door operating buttons shall be rendered inoperative.

(i) A traveling car shall stop at the next available landing for which a car call was registered. When a car stops at a landing, all registered car calls shall be cancelled.

(j) The emergency stop switch shall remain operative.

(2) When the Phase II switch is in the "HOLD" position, the elevator shall be on Phase II operation. The car shall remain at the landing with its doors open. The door close buttons shall be inoperative.

(3) When the Phase II switch is in the ["OFF"] "NORMAL position, the elevator is not at the designated or sky lobby level and Phase I is in effect, the elevator shall operate as follows .

(a) Automatic power-operated horizontally-sliding doors shall close automatically and the car shall revert to Phase I operation (Rule 211.3a) upon completion of door closing. All door reopening devices shall remain inoperative. Door open buttons shall remain operative. Full speed closing is permitted. If the Phase II switch is turned to the ["ON"] "FIREMAN SERVICE" or "HOLD" position prior to the

completion of door closing, the doors shall reopen.
(b) Elevators having power operated vertically sliding doors shall have corridor door open and close buttons rendered operative. All door reopening devices shall remain inoperative. Door closing shall be in accordance with the requirements of Rule 211.3c(1)(d). Full speed closing is permitted. If the Phase II switch is turned to the ["ON"] "FIREMAN SERVICE" or "HOLD" position prior to the completion of door closing, the doors shall reopen. The car shall revert to Phase I operation (Rule 211.3a) upon completion of door closing.
(c) Elevators having manual doors shall revert to Phase I operation (Rule 211.3a) upon completion of door closing.
(4) When the Phase II switch is in the ["OFF"] "NORMAL position and the car is not at the designated or the sky lobby level, and Phase I is not in effect, the car shall remain at the landing with the doors open and door-close buttons inoperative[.] and shall remain in Phase II.
(5) Elevators shall only be removed from Phase II operation when :
(a) The Phase II switch is in the ["OFF"] "NORMAL" position and the car is at the designated or sky lobby level with the doors in the normal open position; or
(b) The Phase II switch is in the ["OFF"] "NORMAL" position when Phase I is in effect {Rule 211.3c(3)}.
(6)(a) For all elevators, applications filed after March 12, 1991 (the effective date of adoption of Cal #11-91-BCR), which propose the installation, alteration or change of controller, elevator machinery and any other work, excluding minor alteration and ordinary repairs as defined in Sections 27-124 and 27-125 of article five of subchapter one of this chapter, and applications filed for new elevator, the cost of which exceeds $10,000 per car over a twelve (12) month period or applications filed for compliance with the requirements of Section 27-996.2 of subchapter eighteen of this chapter shall comply with the requirements of this subdivision.
(b) Applications filed between November 17, 1989 and March 12,1991 for existing elevators which propose the work described in (6)(a) above, shall comply with the requirements of this subdivision.
(c) In elevators subject to the requirements of (6)(a) and (b) above, a "HOLD" position by means of either a three-position switch or a two-position switch in addition to an existing two position ("NORMAL" and "FIREMAN SERVICE") switch and designate the "HOLD" position by engraving or permanently affixing a label to the operating panel of the elevator car.
(d) Applications filed for the installation or modification of Phase II Emergency In-Car Operations/Fireman's Service in existing elevators for which a permit was issued prior to November 17,1989 and the work completed by November 16, 1991 need not provide for the retrofitting of a "HOLD" position on the Emergency In-Car Operating switch, however, the permittee can elect to provide a "HOLD" position.
§63. Amend subdivision d of such rule to read as follows:
211.3d Interruption of Power.- Upon the resumption of power (normal, emergency, [or] standby or actuation of in-car emergency stop switch), the car [may] shall move in the down direction to [reestablish absolute car position] designated or sky lobby level. Restoration of electrical power following a power interruption shall not cause any elevator to be removed from Phase I or Phase II operation.
§64. Add two new subdivisions f and g to such rule to read as follows:
211.3f Emergency Power Selection Switch.- When emergency power is furnished (Rule 211.2) a manual elevator emergency power selection switch shall be provided at the main floor and other levels, approved by the Commissioner to override any automatic sequence operation. If the manual elevator emergency standby power selection switch is of the key-operated type, the switch keys shall conform to the requirements of Rule 211.8.
211.3g Identification of Switches and Buttons
(1)All keyed switch positions and buttons required by this subdivision shall be identified with the appropriate designation in red lettering.
(2) All cover plates for such switches and buttons shall bear the lettering "**FOR FIRE DEPARTMENT USE ONLY."**
§65. Amend subdivision a of rule 211.4 to read as follows:
211.4a Phase I Emergency Recall Operation.- A [three] two- position key-operated switch shall be provided only at the designated or the sky lobby level for each single elevator or for each group of elevators. The [three] two-position switch shall be marked ["BYPASS," "OFF," AND "ON"] "NORMAL" and "FIREMAN SERVICE" (in that order). The Commissioner with the concurrence of the Fire Commissioner may allow [A] an additional two-position key-operated switch marked ["OFF" and "ON"] "NORMAL" and "FIREMAN SERVICE" (in that order) [may be provided] at [any] other location, however, it shall not affect Phase I operation if the designated-level or sky lobby-level smoke detector or waterflow alarm (Rule 211.4b) has been activated. The switch(es) shall be rotated clockwise to go from the ["OFF"] "NORMAL" to ["ON"] "FIREMAN SERVICE" position.] All keys shall be removable [only in the "OFF" and "ON"] from any position[s].
No device, other than Phase I switch(es), [or] the smoke detectors in the elevator lobbies, machine room, or hoistway (Rule 211.3b1), or waterflow alarm in lieu of smoke detectors in the elevator lobbies (Rule 211.3b2) shall initiate Phase I operation.
When all switches are in the ["OFF"] "NORMAL" position, normal elevator service shall be retained and operation from the smoke detectors or waterflow alarm required by Rule 211.4b shall be functional.
[When the designated-level three-position switch is in the "BYPASS" position, normal elevator service shall be restored independent of the smoke detectors required by Rule 211.4b.]
When a Phase I switch is in the ["ON"] "FIREMAN SERVICE" position, a visual and audible signal shall be

provided to alert the attendant to return nonstop to the designated or [alternate] sky lobby level. The visual signal shall read "FIRE RECALL – RETURN TO {insert level to which the car should be returned (the designated or [alternate] sky lobby level)}.The [signal system] The smoke detectors or waterflow alarm shall be activated when Phase I is in effect.

[If an additional two-position Phase I switch is provided it shall not affect the visual signal if the designated-level smoke detector {Rule 211.3b(2)} has been activated.

The "BYPASS" position on the three-position Phase I switch shall not restore the elevator to normal service if the two-position Phase I switch is in the "ON" position.]

§66. Delete subdivision b of this rule and re-adopt it to read as follows:

211.4b Phase I Smoke Detectors or Waterflow Alarm Devices Activation.- Smoke detectors shall be installed in accordance with the requirements of Rules 211.3b(1)(a),(b),(c), and (d).

Phase I operation, conforming to Rule 211.4a shall be initiated when either any smoke detector, in accordance with the requirements of Rule 211.3b(1)(f) or waterflow alarm, in accordance with the requirements of Rule 211.3b(2) is activated.

(1) When the lowest landing of elevators is above the designated level such as the sky lobby level , the activation of smoke detectors or waterflow alarm in sky lobby or sky lobby floor shall cause such elevators to return nonstop to a floor two (2) stories above the sky lobby level or in the absence of a stop at that floor, to the nearest landing above the sky lobby level.

(2) Elevators shall only react to the first smoke detector zone that is activated for that group.

(3) Smoke detectors and/or smoke detector system shall not be self-resetting.

(4) Activation of smoke detectors to initiate elevator recall shall override any automatic programming for car stops but shall not affect the other elevator safety circuits.

(5) The buildings described in Rule 211.3b(1)(k) and meeting its requirements and buildings equipped throughout with an automatic sprinkler system are exempt from the requirements of this rule.

§67. Amend subdivision b of rule 211.5 to read as follows:

b) When operated by a designated attendant in the car (except hospital emergency service):

(1) elevators parked at a floor shall conform to the requirements of Rule 211.3a[(8)](7). At the completion of a time delay of not less than 15 seconds or more than 60 seconds, elevators shall conform to the requirements of Rule 211.3.

(2) a moving car shall conform the requirements of Rule 211.3.

§68 Delete subdivision c and re-adopt it to read as follows:

(c)(1) Hospital Emergency Service Recall Operation. A two-position key-operated corridor call (Hospital Emergency Service) switch is provided at one or more landings to activate the special control function by authorized or designated personnel. The two-position switch shall be marked "NORMAL" and "HOSPITAL EMERGENCY SERVICE". Keys shall be removal only in the "NORMAL" position.

(a) When a switch is in the "**HOSPITAL EMERGENCY SERVICE**" position:

(1) All patient elevator cars equipped with the special control function, override normal automatic operating modes for immediate recall of the patient elevator(s) to the landing at which the call is registered.

(2) On patient elevator cars with two entrances, if both entrances can be opened at the designated level, The doors serving the corridor where the two-position Hospital Emergency Service switch is located shall open and remain open.

(3) A patient elevator car traveling away from the designated level shall reverse at or before the next available landing without opening its doors.

(4) A patient elevator car stopped at a landing other than the designated level, with the doors open and in-car emergency stop switch in the run position, shall close the doors without delay and proceed to the designated level.

(5) A visual and audible signal is activated within the patient elevator car to alert the passengers and/or attendant operator that the "Hospital Emergency Service" function has been activated.

(4) Upon arrival at the registered call landing, power operated doors open automatically and remain in the open position for a predetermined adjustable time period to allow the authorized personnel sufficient time to activate the "In-Car" special operation function.

(6) If the Phase I (Rule 211.3a) recall mode is initiated while the elevator is under "Hospital Emergency Service" recall mode and :In-Car" hospital emergency service is not activated, the elevator shall revert to Phase I Rule 211.3a) operation.

(7) Hospital emergency service corridor recall shall not override fire emergency Phase I (Rule 211.3a) or Phase II (Rule 211.3c) operation in effect.

(c)(2) Hospital Emergency Service In-Car Operation. A two-position "NORMAL"and " HOSPITAL EMERGENCY SERVICE" key-operated switch is provided in an operating panel inside the patient elevator(s) to activate the "Hospital Emergency Service, a special independent operating mode. The switch shall be rotated clockwise to go from the "NORMAL" to "HOSPITAL EMERGENCY SERVICE" position. It shall become effective only when the designated level corridor call "Hospital Emergency Service" switch is in the "HOSPITAL EMERGENCY SERVICE" position and car has returned to the designated level by "Hospital Emergency Service" recall operation.

(a) When the "In-Car" switch is in the "HOSPITAL EMERGENCY SERVICE" position, the patient elevator shall be on Hospital emergency Service operation, and the patient elevator shall operate as follows:

(1) The patient elevator shall be operable only by a designated person in the car.

(2) Activation of the "In-Car" operating mode removes the patient elevator from normal automatic and/or attendant service.
(3) After the activation of "In-Car" operation mode, the patient elevator(s) shall not be recalled under Phase I (Rule 211.3a) operation.
(4) Doors remain open until the authorized person registers the car call and initiate the door closing function.
(5) The patient elevator shall travel directly to the selected landing overriding normal corridor call demand or Phase I (Rule 211.3a) recall and automatically opens the doors upon the arrival at the selected landing, except when the smoke detector(s) are activated on the selected landing or the waterflow alarm is activated on that floor before the patient elevator has reached the selected landing, the patient elevator shall stop at a floor two stories below the selected landing or in the absence of a stop at that floor, at the nearest landing below the selected landing.
(6) The patient elevator has reached the selected floor and the smoke detector(s) are activated on that landing or the waterflow alarm is activated on that floor before the doors are open, the patient elevator without opening the doors shall travel to a floor two stories below the selected landing or in the absence of a stop at that floor, to the nearest landing below the selected landing.
(7) Doors shall remain open with the audible and visual signal functioning until the "in-Car" switch is turned to the "NORMAL" position or for a predetermined adjustable time period to allow the removal of patient from the car and the patient elevator is placed into automatic, attendant or Phase I (Rule 211.3a) if in effect, operating mode.
(8) Upon transfer from "HOSPITAL EMERGENCY SERVICE" back to normal operation during a fire emergency and Phase I (Rule 211.3a) is in effect, the patient elevator shall be automatically recalled to the designated level.
(c)(3) Hospital Emergency Service Switches Color. Color of the Hospital Emergency Service switches located in corridor at the designated level and inside the patient elevator(s) operating panel shall be "BLUE".
§69 Delete rule 211.7.
§70. Amend rule 211.8 to read as follows:
The switches required by Rule 211.2 through 211.5 for all elevators in a building shall be operable only by [the same] a city-wide standard key and shall also made operable by the Fire Department standard key. [This key shall not be part of a building master key system. There shall be a key for the designated level switch and for each elevator in the group.] The citywide standard key shall be designed in accordance with the requirements of the Fire Department and shall be obtained only through Fire Department authorization. [These] Citywide standard keys shall be kept on the premises by a person responsible for the maintenance and operation of the elevators in a location readily accessible to authorized [personnel] persons in an emergency, but not where they are available to the public.
[NOTE (Rule 211.8): Local authorities may specify a uniform keyed lock box to contain the necessary keys.]
§71. Delete paragraph 3 of subdivision e of rule 212.9 and re-adopt it to read as follows:
(3) Suppliers of wedge sockets shall submit certification with an MEA Number after successfully passing the tests described in Rule 212.9e(1) and(2) at an MEA certified testing laboratory to secure MEA acceptance. Sockets shall be tagged with visible permanent manufacturer's identification with an MEA Number.
§72. Amend rule 213.1 to read as follows:
Rule 213.1 Qualification of Welders
Where required by another Rule of the [this] Code welding of parts, except for tack welds later incorporated into finished welds, shall be done by welders qualified in accordance with the requirements of [Section 5 of ANSI/AWS D1.1.
At the option of the manufacturer or contractor, the welders may be qualified by one of the following:
(a) the manufacturer or contractor;
(b) a professional consulting engineer;
(c) a recognized testing laboratory.] The City of New York. When the manufacturer is located in the City of New York its welders shall be licensed in accordance with the provisions of the Administrative Code. When the manufacturer is not located in the City of New York its welders shall either be licensed in accordance with the provisions of the Administrative Code, or in the alternative, pursuant to paragraphs (f) and (o) of Section 25-01 of Title 2 of the Rules of the City of New York, shall possess documentary evidence from a testing laboratory acceptable to the Commissioner attesting that the applicant has passed the qualification test prescribed by the City of New York.
§73. Adopt section 4.10 Elevators of ANSI A117.1-1986 as modified as a new section 216.
SECTION 216
Passenger Elevators Designed to Accommodate Persons Having Disabilities
Section 4.10 Elevators
4.10 General
(i) Amend the last sentence of subsection 4.10.1 to read as follows:
Freight elevators shall not be considered as meeting the requirements of this section unless the only elevators provided are used as combination passenger and freight elevators meeting the requirements of rule 207.4 of ANSI A17.1-1996.
4.10.2 Automatic Operations
4.10.3 Hall Call Buttons
4.10.4 Hall Lanterns
4.10.5 Raised Characters on Hoistway Entrances
4.10.6 Door Protective and Reopening Device
4.10.7 Door and Signal Timing for Hall Calls
4.10.8 Door Delay for Car Calls
4.10.9 Floor Plan of Elevator Cars
(ii) Amend subsection 4.10.9 of this section to read as follows:
4.10.9 Floor Plan of Elevator Cars.- The floor area of elevator cars shall provide space for wheelchair users to enter the car, maneuver within reach of controls, and exit from the car. Acceptable door opening and inside dimensions

shall be as shown in Figure 22 with the following exception for the existing installation. The clearance between the car platform sill and the edge of any hoistway landing shall be no greater than [11/4 inch (32 mm)] 11/2 inch (38 mm).
Exception:
1. The replacement of an existing elevator car whose clear depth is 48 inches or more and width is 48 inches or more but less than 54 inches and are limited by the existing car platform or hoistway shaft. The door opening shall be 32 inches.
2. The replacement of an existing car need not comply with the requirements of door opening, if the clear depth and width are less than 48 inches and is limited by the existing car platform or hoistway shaft.
3. If the new car door opening is larger than the hoistway door opening, the travel of car shall be limited to the opening of the hoistway door.
4.1010 Floor Surfaces
4.10.11 Illumination levels
4.10.12 Car Controls
4.10.13 Car position Indicators
4.10.14 Emergency Communication.
§74 Amend rule 300.2 to read as follows:
Rule 300.2 Machine Rooms and Machinery Spaces
Machine rooms and machinery spaces shall conform to the requirements of Rule 101.1 through 101.5 and Rule 101.7 and shall be vented to the outside air naturally or mechanically.
§75 Add the following sentence to the end of subdivision g of rule 300.8 to read as follows:
Space above the escape hatch defined by the guard railing shall be designated as the refuge space.
§76 Amend the first paragraph of rule 301.8 to read as follows:
Rule 301.8 Car Safeties
Car safeties shall be provided for roped-hydraulic elevators and [shall be permitted to be provided for] direct-acting hydraulic elevators.[when provided ,c] Car safeties shall conform to the requirements of Section 205 and to the following:
§77. Delete rule 303.7.
§78. Amend paragraph 2 of subdivision a of rule 306.3 to read as follows:
(2) It shall maintain the car within [25mm (1 in.)] 13 mm (1/2 in.) of the landing irrespective of the position of the hoistway door. See subsection 4.10.2 of Section 216.
§79. Amend subdivision b of rule 306.6 to read as follows:
(b) Electrical equipment shall [be certified to] meet the requirements of CSA B44.1/ASME A17.5.
§80. Amend subdivision b of rule 508.4 to read as follows:
(b) Electrical equipment shall [be certified to] meet the requirements of CSA B44.1/ASME A17.5.
§81. Delete PART VI in its entirety.
§82. Amend paragraph 2 of subdivision e of rule 702.4 to read as follows:
(2) Electrical equipment shall[be certified to] meet the requirements of CSA B44.1/ASME A17.5.
§83. Delete section 800 and re-adopt it to read as follows:

SECTION 800
PROTECTION OF FLOOR OPENING
Rule 800.1 Protection required
Floor openings for escalators shall be protected against the passage of flame, heat and/or smoke or gases in the event of fire.
Rule 800.2 Escalators Accredited as a Required Means of Egress
Escalators accredited as a required means of egress shall meet the requirements of Section 27-378 of article five of subchapter six of this chapter.
Rule 800.3 Escalators not Accredited as a Required Means Of Egress
Escalators not accredited as a means of egress shall have the floor openings protected by any one of the following:
800.3(a) Full enclosures- as specified in Rule 800.2 of this section.
800.3(b) Automatic rolling shutters-
Unenclosed escalators, which are not protected as specified in subdivision a of this rule shall be equipped with a power-operated automatic rolling shutter at every floor pierced thereby, constructed of noncombustible materials with a fire resistance rating of not less than one and one-half (1½) hours.
Construction.- The shutter shall close immediately upon the activation of the fire detection system in the building and shall completely close the well opening. The shutter shall operate at a speed of not more than 30 feet per minute (0.15 m/s) and shall be equipped with a sensitive leading edge to arrest its progress when in contact with any obstacle, and to continue its progress on release therefrom. There shall be a manual means of operating and testing the operation of the shutter. The shutters shall be operated by building personnel at least once a week to assure that they remain in proper operating condition.
800.3(c) Sprinkler protection-
In buildings completely protected by an automatic sprinkler system complying with the construction requirements of subchapter seventeen of this chapter, escalator openings shall be protected by a draft curtain and by a deluge sprinkler system designed to form a vertical water curtain.
Draft curtain.- A draft curtain shall be installed in each story of the floor opening. The draft curtain shall enclose the perimeter of the opening and shall extend from the ceiling downward at least twenty-four (24) inches on all sides. The lower edge of the draft curtain shall be not less than twelve (12) inches below the bottom of the sprinkler heads. Sprinkler heads of the deluge sprinkler system shall be within two (2) feet of the draft curtain.
§83A. Amend rule 802.3c to read as follows:
802.3e Clearance Between Balustrades and Steps.-
The clearance on either side of the steps between the steps and the adjacent skirt guard shall be not more than three-sixteenths (3/16) inch, and the sum of the clearances on both sides shall be not more than one-quarter (1/4) inch.
§83B. Delete the EXCEPTION to Rule 802.3c.
§84. Delete rule 805.2 and re-adopt it to read as follows:

Rule 805.2 Starting Devices

In every new and existing escalator, starting devices shall be provided with the combination of a starting switch and a starting button. The escalator shall be started only after the activation of both the switch and the button.

(a) Starting Switch.- Starting switch shall be of continuous pressure spring return type and shall be operated by a cylinder type lock having five-pin, five-disc or five-tumbler combination. Starting switch shall be of three-position type and shall be clearly marked as follows:

NORMAL.- A central position for the key entry and spring return position.

START-UP.- A right side position for starting the escalator in the upward direction.

START-DOWN.- A left side position for starting the escalator in the downward direction.

(b) Starting Button.- Starting button shall be of the constant pressure type and located within six (6) inches from the starting switch. It shall be clearly marked "**Starting Button".**

(c) Cover Plate.- The starting devices shall be protected by a locked, transparent cover plate that can be opened by the starting key and clearly marked **"For Start Only."**

(d) Location of starting devices.- Starting devices shall be located at top and bottom of the escalator on the right side-facing newel.

NOTE: The starting key shall be kept on the premises at all times and may only be accessible to persons authorized to start escalators. It shall also be made available to the Commissioner or his representative.

§85. Amend paragraph 1 of subdivision a of rule 805.3 to read as follows:

(1) Location.- A red stop button shall be visibly located at the top and bottom landings on the right side facing the escalator. Remote stop buttons are prohibited except that any escalator connected to an automatic fire alarm system shall gradually stop not exceeding the speed of 3 ft per sec² (0.91 m/s²) upon the activation of such system.

§86. Amend subdivision f of such rule to read as follows:

805.3f Skirt Obstruction Device.- Means shall be provided to cause the electric power to be removed from the escalator driving machine motor and brake, if an object becomes caught between the step and the skirt as the step approaches the upper [or] combplate, intermediate device or lower combplate. On units having a run of twenty (20) feet or more intermediate devices shall be provided on both sides of the escalator with devices located at interval of ten (10) feet or less. The activation intermediate devices shall stop the escalator at a rate not greater than 3 feet per second square in the direction of travel. The upper and lower combplate devices shall be located so that the escalator will stop before that object reaches the combplate. The activation of any skirt device shall stop the escalator with any load up to full brake rated load with escalator running {Rules 802.9c(1)(b) and 802.9c(2)(b)}.

§87. Amend the first paragraph of subdivision n of such rule to read as follows:

805.3n Combplate Impact Devices.

Two independent devices, one at the side of the combplate and the other at the center of the front edge of the combplate shall be provided. Devices [which] will cause the opening of the power circuit to the escalator driving machine motor and brake if either:

§88. Add new subdivision q to such rule to read as follows:

805.3q Comb-Step Stop Device.- On every new and existing escalator a comb-step stop device shall be provided at the upper and the lower comb-steps. Any obstruction exerting a pressure of 45 lbs for steps not exceeding thirty two (32) inches in width and 60 lbs for steps over thirty two (32) inches in width between the step tread and comb-step shall activate the comb-step stop device to cause the electric power to be removed from the escalator driving machine motor and brake.

§89 Amend the first paragraph of subdivision k of rule 905.3 to read as follows:

905.3k Comb-Pallet Impact Devices. Two independent devices, one at the side of the comb-pallet and the other at the center of the front edge of the comb-pallet shall be provided. Devices [which] will cause the opening of the power circuit to the moving walk driving machine motor and brake if either:

§90. Add new subdivision l to rule 905.3 to read as follows:

905.3l Comb-Pallet Stop Device.-In every new and existing moving walkway, a comb-pallet stop device shall be provided at the entrance to and exit from a moving treadway. Any obstruction exerting a pressure of 45 lbs for treadway not exceeding thirty two (32) inches in width and 60 lbs for treadway over thirty two (32) inches in width between the moving treadway and comb-pallet shall activate the comb-pallet stop device which will cause the opening of the power circuit to the moving walk driving-machine motor and brake.

§91 Delete rule 1000.1 and re-adopt it to read as follows:

Rule 1000.1 Persons Authorized to Make Inspections and Tests

The inspector shall meet the qualification requirements of the Department of Buildings of the City of New York.

§92. Delete rule 1000.3 and re-adopt it to read as follows:

Rule 1000.3 Installation Placed Out of Service

Where for any reason an installation is placed out of service permanently or temporary (see Section 3 definition) so that it cannot be operated for a definite period, it shall comply with the following requirements:

1000.3a Elevators Are Not in Use.- If these elevators are available for service, all required tests shall be regularly performed. These elevators are similar to those in service except that their power feed lines have been disconnected by opening the main line switch. A periodic inspection shall be made and a fee charged. An elevator inspector shall note such requirements when found on a regular inspection.

1000.3b Elevators Placed Out of Active service (Dismantled).- These elevators shall meet the requirements of Section 3 definition for installation placed out of service. In addition, a Building Notice application shall be filed and

the last inspection fee charged. Thereafter, one (1) additional inspection per year shall be made to verify that the status is unchanged and fees shall be paid for such inspection. Before the installation is put back in service, a Building Notice application is filed. For access, it shall comply with the requirements of Rule 1000.3c(1)(b)(4).

1000.3c Elevators Are Removed and Permanently Discontinued

(1) When a single elevator with one elevator shaftway is removed and permanently discontinued, a Building Notice application shall be filed, fees charged for last inspection and shall meet the following requirements for such discontinuance for sealing of elevator hoistway shaft:

(a) If it is proposed to extend the floor at every story of the building, the new construction shall be the same or of similar construction as the existing adjacent floor and of equivalent or better fire resistive rating. Also the elevator car and guide rails, the counterweight and guide rails, all wire cables and other equipments in the hoistway shaft shall be completely removed.

(b) If the hoistway shaft is to remain open-

(1) in addition to the requirements of subparagraph a above except floor construction, all door and window assemblies opening onto masonry shaftway and masonry enclosed associated machine rooms, except as noted in item 4 of this subparagraph below shall be completely removed and the open space so created shall be filled with the same material of equal thickness, or similar material and of equivalent or better fire restive rating as the adjacent masonry.

(2) all door and window assemblies opening onto hoistway shaft originally enclosed with an open wire screen and subsequently enclosed with other than masonry units (i.e. metal lath and plaster or transite boards), except as noted in item 3 of this subparagraph below, shall remain. However, the door and window assemblies shall be fastened in a closed position and shall be adequately welded shut. The assembly shall, in addition, be enclosed in material of equal thickness, or of similar material and of equivalent or better fire resistive rating as the adjacent enclosure.

(3) the sidewalk elevator door at the street level shall be fastened in a closed position and shall be adequately welded shut. The underside of such door, shall be properly reinforced and supported by steel beams and columns so as to support the same loading as the sidewalk.

(4) Fireman access to the bottom of the hoistway (elevator pit) shall be provided through the door assembly of the pit door and shall meet the following requirements:

(i) if the machine room is located at or near the level of the bottom of the shaftway and is so located that access to the bottom of the shaftway is readily available through the machine room, the door to the machine room shall be kept closed with a substantial dead bolt locking device openable only with an elevator key.

(ii) if the machine room is located other than at or near the level of the bottom of the shaftway or the bottom of the shaftway is not readily accessible through the machine room, the lowermost door opening onto the shaftway shall be kept closed with a substantial dead bolt locking device openable only with an elevator key. A conspicuous sign of one (1) inch block letters with contrasting background permanently affixed to the door and shall read "HOISTWAY".

(iii) the key to the locking device required in subitems (i) and (ii) above shall be kept by the building superintendent and is readily available to the Commissioner or his representative and the fireman.

(c) The ventilation opening (smoke hole) in the flooring provided at the top of the hoistway immediately below the sheaves or at the level of the top of the machine room floor beams and the ventilation opening at the exterior portion of the machine room shall be maintained.

(d) All electric service to the elevator hoistway and machine room shall be disconnected outside the confines of the elevator hoistway and machine room.

(2) When a single elevator in multi-elevator shaftway is removed and permanently discontinued, a Building Notice application shall be filed, fees shall be charged for the last inspection and shall meet the following requirements for such discontinuance sealing of elevator hoistway shaft.

(a) If it is proposed to extend the floor at every story of the building it shall meet the requirements of subparagraph (a) of paragraph (1) of this subdivision, and the shaft enclosure is rearranged so that the remaining operating elevators are properly enclosed to maintain the integrity of the shaftway.

(b) If the hoistway shaft is to remain open-

(1) in addition to the requirements of subparagraph (a) of paragraph (1) of this subdivision except for floor construction, all door assemblies serving the discontinued elevator, opening onto masonry shaftway shall be completely removed and the open space so created shall be filled with the same material of equal thickness, or of similar material and of equivalent or better fire resistive rating as the adjacent masonry.

(2) all door assemblies serving the discontinued elevator, opening onto hoistway shaft originally enclosed with an open wire screen and subsequently enclosed with other than masonry units (i.e. metal lath and plaster or transite boards), shall remain. However, the door assemblies shall be fastened in a closed position and shall be adequately welded shut. The assembly shall, in addition, be enclosed in material of equivalent or better fire resistive rating as the adjacent enclosure.

§93 Adopt new rule 1000.4 to read as follows:

Rule 1000.4 Escalator Installation Placed Out of Service

1000.4a Escalators Are Not in Use. If these escalators are available for service, all required tests shall be regularly performed. These escalators are similar to those in service except that their power feed lines have been disconnected from the mainline disconnect switch and their entrances have been barricaded. A periodic inspection shall be made and fee charged. An elevator inspector shell note such requirements when found on a regular inspection.

1000.4b Escalators are Discontinued or Placed Out of Active Service.

In addition to the requirements of Rule 1000.4a, a Building Notice application shall be filed and the last inspection fee

charged. Thereafter, one (1) additional inspection per year shall be made to verify that the status is unchanged and fees shall be paid for such inspection. Before the installation is put back in service, it shall be subject to all of the required routine and periodic inspections and tests.

1000.4c Escalators are Removed and Permanently Discontinued. A Building Notice application shall be filed and fees charged for the last inspection. The escalator steps, newels, rails, all wire cables and other equipments of escalator and machinery shall be completely removed.

An opening created by the removal of the escalator, it shall be filled with new construction of the same or of similar construction as the existing adjacent floor and of equivalent or better fire restive rating.

§94 Adopt new rule 1000.5 to read as follows:

Rule 1000.5 Moving Walk Installation Placed Out of Service

1000.5a Moving Walks are Not in Use. If these moving walks are available for service, all required tests shall be regularly performed. These moving walks are similar to those in service except that their power feed lines have been disconnected from the mainline disconnect switch and their entrances have been barricaded. A periodic inspection shall be made and fees charged. An elevator inspector shall note such requirements on a regular inspection.

1000.5b Moving Walks are Discontinued or Placed Out of Active Service. These moving walks shall meet the requirements of Rule 1000.5a except for periodic inspection. In addition, a Building Notice application shall be filed and the last inspection fee charged. There after, one (1) additional inspection per year shall be made to verify that the status is unchanged and fees shall be paid for such inspection. Before the installation is placed back in service, it shall be subject to all of the required routine and periodic inspections and tests.

1000.5c Moving Walks are Removed and Permanently Discontinued. A Building Notice application shall be filed and fees charged for the last inspection. The moving walk treadways, newels, rails, all wire cables and other equipments of moving walk and machinery shall be completely removed.

An opening created by the removal of the moving walk shall be covered by new construction of the same or of similar construction as the existing adjacent floor and of equivalent or better fire resisting rating.

§95 Amend rule 1001.1 to read as follows:

Rule 1001.1 Inspection and Test Periods

The routine inspection and tests of passenger and freight electric elevators shall be made at intervals [not longer than 6 months] of five (5) times every two years, or as otherwise provided by the commissioner per Section 27-998(a) of article three of subchapter eighteen of such chapter. All references to Items are to Items in A17.2, Inspections' Manual for Electric Elevators.

NOTE {Rule 1001.1}: See Rule 1010.2 for private residence elevators.

§96 Amend rule 1002.1 to read as follows:

Rule 1002.1 Inspection and Test Periods In addition to the routine inspection and tests (Rules 1001.1 and 1001.2), the inspection and tests specified in Rule 1002.2 shall be performed at intervals not longer than [1] 2 years, and the inspections and tests specified in Rule 1002.3 shall be made at interval not longer than 5 years.

NOTE {Rule 1002.1}: See Rule 1010.2 for private residence elevators.

§97 Amend title of rule 1002.2 and add new paragraph to such rule to read as follows:

Rule 1002.2 [1] 2 Year Inspection and Test Requirements

Exception to 2 year inspection and test requirements of this rule shall be as specified in the following subdivisions.

§98 Amend subdivision a of such rule to read as follows:

1002.2a Oil Buffers. Car and counterweight buffers shall be tested at an interval of not longer than one (1) year as per Section 27-998(a) (2) of the Building Code to determine conformance with the applicable plunger return requirements (Rule 201.4e: Item 5.3.2).

§99 Amend paragraph 1 of subdivision b of such rule to read as follows:

(1) Inspection. All working parts of car and counterweight safeties shall be inspected at an interval of not longer than 1 year as per Section 27-998(a)(1) of the Building Code to determine that they conform to the applicable requirements and Section 1202 (Rules 205.10 and 205.11; Division 112).

§100 Amend subdivision c of such rule to read as follows:

1002.2c Governors. Governors shall be tested at an interval of not longer than one (1) year as per Section 27-998(a)(2) and shall be inspected and operated manually to determine that all parts, including those which impart the governor pull through tension to the governor rope, operate freely. Item 2.28.2(a). In addition to two (2) year inspection, the tag shall be inspected at an interval of not longer than one (1) year.

§101 Add new subdivision o to rule 1003.3 to read as follows:

(o) When controller is changed and mode of operation remains the same, the following tests shall be required:

(1) Full load operational test

(2) 125% test and pull switch at lowest landing after stop for five (5) minutes.

Definition of full load operational test:

(1) Top to bottom at contract speed.

(2) Contract load, stop level (± ½") at every stop up and down.

§102 Add new subdivision L to rule 1003.2 to read as follows:

1003.2L Brake. A test of the brake shall be made with 125% of load. When the car returns to the lowest landing, pull the main line switch while the car is being stopped to ensure the brake has set and holds the load.

§103 Amend rule 1004.1 to read as follows:

Rule 1004.1 Inspection and Test Periods

The routine inspection and tests of passenger and freight hydraulic elevators shall be made at intervals [not longer than 6 months] of five (5) times every two (2) years or as otherwise provided by the commissioner per Section 27-998(a) of article three of subchapter eighteen of such chapter. All references to Items are to Items in A17.2.2,

Inspectors' Manual for Hydraulic Elevators.
NOTE: {Rule 1004.1}: See Rule 1010.2 for private residence elevators.
§104 Amend rule 1005.1 to read as follows:
Rule 1005.1 Inspection and Test Periods
In addition to the routine inspections and tests (Rules 1004.1 and 1004.2), the inspections and tests specified in Rule 1005.2 shall be performed at intervals not longer than [1] 2 years, the inspections and tests specified in Rule 1005.3 shall be made at intervals not longer than 3 years, and the inspections and tests specified in Rule 1005.4 shall be made at intervals not longer than 5 years.
NOTE: See Rule 1010.2 for private residence elevators.
§105 Amend the title of rule 1005.2 to read as follows:
Rule 1005.2 [1] 2-Year Inspection and Test Requirements
§106 Add new subdivision d to rule 1005.4 to read as follows:
(d) Full load test will not be required. Pressure test shall be performed in accordance with Item 2.14.2 of ASME A17.2b-1996.
§107 Amend rule 1007.1 to read as follows:
Rule 1007.1 Inspections and Test Periods
Routine inspections and tests of escalators and moving walks shall be made at intervals not longer than 6 months for moving walks and at intervals of five times every two (2) years per Section 27-998(b) of article three of subchapter eighteen of such chapter. All references to Items are to Items in A17.2.3 Inspectors' Manual for Escalators and Moving Walks.
§108 Amend rule 1008.1 to read as follows:
Rule 1008.1 Inspection and Test Periods
In addition to the routine inspection and test (Rules 1007.1 and 1007.2), the inspection and tests specified in Rule 1008.2 shall be performed at intervals not longer than [1] 2 years.
§109 Amend the title of rule 1008.2 to read as follows:
Rule 1008.2 [1] 2-Year Inspection and Test
§110 Add new subdivisions, r, s and t to such rule to read as follows:
1008.2r Combplate Stop Switch.
1008.2s Test Report Form. All testing requirements for escalators required by this rule shall be reported on Form ELV3-Rev-1998 (2 year test for escalators) of the Department of Buildings.
1008.2t Test Tag. 2-year test tag for escalators and moving walks shall be affixed in the vicinity of the lower starting device for escalators and of the starting device and the entrance of the moving walks.
§111 Amend the first paragraph of rule 1010.2 to read as follows:
Rule 1010.2 Private Residence Elevators and Lifts
Private residence elevators and lifts [should be subject to the applicable routine and periodic inspections and tests, and] shall be subject to acceptance inspections and tests specified in Sections [1000 through 1006] 1003 and 1006. [Routine inspection should be performed at intervals not longer than 1 year.]
§112 Amend first paragraph of rule 1010.4 to read as follows:
Rule 1010.4 Dumbwaiters
Dumbwaiters shall be subject to the applicable [routine, periodic and] acceptance inspections and tests specified in Sections [1000 through 1006] 1003 and 1006. [Routine inspections shall be performed at intervals not longer than 1 year.]
§113 Add second paragraph to rule 1102.1 to read as follows:
The lap edges of passenger (A17.1 horizontal slide type) elevator door, including the lap edges of multi-section doors, shall not move from the wall or adjacent panel sufficiently to develop a separation of more than two (2) inches during the fire portion of the test and not more than two and seven-eighth (2 7/8) inches during or immediately following the hose stream test.
§114 Delete section 1104.
§115 Amend subdivision f of rule 1200.4 to read as follows:
1200.4f Labeled and Listed Devices. When a component in a labeled and listed device, including but not limited to interlocks (Rule 111.2), fire doors (Rule 110.15) [, and electrical equipment {Rules 210.4(b), 306.6.6(b),etc,}] is replaced, the replacement component shall be subject to the requirement of [B44.1/A17.5 and /or] the engineering type test in Part XI. When a component in a labeled and listed device of electrical equipment {Rules 210.4(b), 306.6(b), 508.4(b), 702.4(e)(2), etc.} is replaced, the replacement component shall be subject to the requirements of B44.1/ASME A17.5 and/or the engineering type test in Part XI.
§116 Delete subdivision b of rule 1200.5.
§117 Amend subdivision a of rule 1201.11 to read as follows:
1201.11a Interlocks. Where the alteration consists of the installation of hoistway door interlocks, the installation shall conform to the requirements of Rules 111.1, [111.3, 111.5, 111.6, 111.7, 111.9, 111.10, 111.11, 111.12] 111.2, 11.5, 111.6, 111.7, 111.10, and 208.8.
§118 Amend subdivision b of such rule 1 to read as follows:
1201.11b Mechanical Locks and Electric Contacts. Where the alteration consist of the installation of hoistway door combination mechanical locks and electric contacts, the installation shall conform to the requirements of Rules 111.1, [111.4, 111.5, 111.6, 111.7, 111.9, 111.10, 111.11, 111.12] 111.2, 111.3, 111.4, 111.5, 111.6, 111.7, 111.10, 111.12, and 208.8.
§119 Amend subdivision c of such rule to read as follows:
1201.11c Parking Devices. Where the alteration consists of the installation of elevator parking devices, the installation shall conform to the requirements of Rules [111.8, 111.9, 111.10, 111.11, 111.12] 111.5, 111.6, 111.7, 111.8, 111.10, and 208.8.
§120 Amend subdivision d of such rule to read as follows:
1201.11d Access Switches and Unlocking Devices. Where the alteration consists of the installation of hoistway access switches or hoistway door unlocking devices, the installation shall conform to the requirements of Rules [111.9, 111.10,111.11, 111.12] 111.5, 111.6, 111.7,

111.10, and 208.8.

§121 Add new rule 1201.13 to read as follows:

Rule 1201.13 Elevator Alteration in Commercial Buildings Being Converted to Residential Occupancy

All new and existing passenger or freight elevators, located in commercial buildings being converted into an interim multiple dwellings registered with the Loft Board in accordance with Article 7-c of the Multiple Dwelling Law are designated as service elevators and shall comply with Section 211 and Local Law 5 of 1073, Local Law 16 of 1984 and Local Law 17 of 1995 and all applicable revisions. The following items shall comply with this Rule:

(1) Freight Elevators. Existing freight elevators may be used to carry passengers when they have been altered to conform to this Rule.

(2) Machine Rooms. Existing machine rooms or machinery spaces including all access assemblies shall have a minimum fire resistance rating of 1-hour and shall be vented in conformance with the requirements of Rule 100.4.

(3) Location of Equipment and Electrical Wiring. Equipment in machine rooms shall be in conformance with the requirements of Rule 101.2.

(4) Structural Supports. At the machine room level and one story below the machine room, all new beams and columns supports shall be of structural steel. Structural supports of existing wood shall be subject to controlled inspection and shall be properly fire protected. These requirements shall also apply to elevator machine supports located in basements. Supports shall comply with the requirements of Rule 105.1.

(5) Pits. A pit shall conform to the requirements of Rule 106.1.

(6) Hoistway Doors. Hoistway doors, conforming to the requirements of Rule 110.1 shall be self-closing, either vertical or horizontal sliding or swing-type with at least 1-hour fire resistance rating.

(7) Locations of Car Door. The maximum distance between the hoistway face of the car door and hoistway face of the hoistway door shall not exceed 5½ inches and shall conform to the requirements of Rule 204.4e(2).

(8) Vision panels. Vision panels and protective grills on manually operated door shall conform to the requirements of Rules 204.2e and 204.5e. Grills shall be provided on all existing vision panels.

(9) Interlocks and Electrical Contacts. Hoistway doors shall be provided with accepted interlocks and electrical contacts conforming to the requirements of Rule 111.1.

(10) Elevator Parking Devices. When required by Rule 111.8a elevator parking devices shall be provided conforming to the requirements of Rule 111.8b.

(11) Guide Rails. Elevator car and counterweight guide rails conforming to the requirements of Rule 200.1 shall be provided.

(12) Buffers. Buffers conforming to the requirements of Rule 201.1 shall be provided.

(13) Car Enclosures. Materials of elevator car enclosures shall conform to the requirements of Rule 204.2a. Wood platforms shall conform to the requirements of Rule 203.6d.

(14) Top Emergency Exit. Elevators shall be equipped with a car enclosure, which shall have a top emergency exit conforming to the requirements of Rule 204.1e.

(15) Car Safeties and Governor. Cars shall be provided with a car safety conforming to the requirements of Rule 205.1. Governor rope shall be either of iron or steel and shall meet the requirements of Section 206.

(16) Rated Load. The rated load in pounds for a service car shall be calculated based on inside net platform area conforming to the requirements of the passenger elevator, Rule 207.1.

(17) Terminal Stopping Devices. Terminal stopping devices conforming to the requirements of Section 209 shall be provided.

(18) Operating Devices. Operating devices conforming to the requirements of Rule 210.1 shall be provided.

(19) Ropes. Elevator cars shall be suspended by iron or steel wire ropes conforming to the requirements of Rule 212.1.

§122 Amend paragraph 2 of subdivision b of rule 1202.5 to read as follows:

(2) Where an alteration is made to a side emergency exit, or where a new one is installed, it shall conform to the requirements of Rule 2041j. Side emergency exit may be eliminated but corresponding elevator side emergency exit must also be eliminated.

§123 Amend paragraphs 2, 3, and 4 of subdivision c of such rules to read as follows:

(2) Where an existing enclosure other than specified in Rule 1202.5(c)(1) is retained and new material is installed, the new material and adhesive shall conform to the following requirements, based on the tests conducted in accordance with the requirement of ASTM E 84, UL 723 or NFPA 255:

(a) Flame spread rating of 0 to 25

(b) Smoke development of 0 to [450] 100.

(c) Toxicity shall meet the requirements of Section 27-348(e) of the Building Code.

If the material or combination of materials installed exceeds ¼ in. (6.4 mm) in thickness, the car enclosure shall conform to the requirements of Rule 204.2a(1).

(3) [Napped, tufted, woven, looped, and similar materials shall conform to the requirements of Rules 204.2a(1) and (2) or Rule 1202.5(c)(2) and Sections 1104 and 1106. Adhesive shall conform to the requirements of Rule 1202.5(c)(2).] Materials for insulating, sound deadening or decorative purposes may be used for lining enclosures if firmly bonded flat to the enclosure without intervening air spaces. Such materials shall not be padded or tufted, shall be Class A interior finish pursuant to Section 27-348(b) of the Building Code and shall have a smoke development rating of 0 to 25 pursuant to Section 27-348(d) of the Building Code.

(4) Floor covering, underlayment, and its adhesive shall [have a critical radiant flux of not less than 0.45 W/cm² as measured by ASTM E 648] conform to the requirements of Rule 204.2(a)(4).

§124 Amend subdivision b of rule 1202.10 to read as follows:
1202.10[b]c Increase in Rated Speed
§125 Add new subdivision b to such rule to read as follows:
1202. 10b Decrease in Travel. Where an alteration involves a decrease in travel which eliminates top terminal floor landing, it shall, in addition to requirements of Rule 1202.10a meet the requirements of any one of the following:
(1)(a) If the wall is erected in front of elevator entrance openings, the unused shaftway doors shall be sealed with through-bolts. Electromechanical safety interlocks wired into safety circuit of each elevator shall remain.
(b) New slow-down, normal and final limits for the new top terminal floor landing shall be installed.
(c) Access provisions for the original top floor landing from the car operating panels shall be removed.
(d) The original final limits shall remain operable at the top of the hoistway for safety.
(e) Access to the original top terminal landing shall be provided for maintenance and servicing of hung secondary equipment and inspection of wire rope cables per ASME A17.2 Standards.
(f) Elevator car enclosures shall be equipped with side and top emergency exits.
(2)(a) If the wall is erected in front of elevator entrance openings, a suitable access shall be provided for emergency situations.
(b) Inspection control shall allow qualified personnel to by-pass the new limits on speed for maintenance and inspection.
(c) The new top terminal final limit switch shall be design for manual resetting.
(d) The system shall be capable of a double electrical protection with the same run-by (36" for oil hydraulic buffers) clearance to stop mechanically using the counterweight buffer when an over-speed malfunction occurs.
(e) The original top terminal landing shall be available for maintenance and inspection.
(f) The safety interlock must be used for the corridor entrance doors in circuit with an access key provision.
§126 Amend paragraph 1 of subdivision d of rule 1202.12 to read as follows:
(1) When a controller is installed in place of an existing controller, without any change in the type of operation or control, the new controller shall conform to the requirement of Rules 210.4 and 210.9. The installation shall also conform to the requirements of Rules 210.6, 210.7, 210.8, 211.3 through [211.8] 211.9, and Section 209.
§127 Amend the last paragraph of rule 1202.13 to read as follows:
Where an alteration is made to firefighters' service operation, the installation shall conform to the requirements of Rules 211.3 through [211.8] 211.9.
§128 Add new subdivision e to rule 1202 .14 to read as follows:
1202.14e Wedge Clamp Shackles. Where an alteration is made to provide wedge clamp shackles, the installation shall be filed by the Professional Engineer or the Registered Architect and shall conform to the requirements of Rule 212.9e. In addition, the installation for retrofits, cable repair replacements, etc., shall provide installation of apparatus on both sides of cable ends (car and counterweight) and submit the design of cable hitch plates, clearances between shackles, staggering of shackles for entrance, use of tensioning, isolation bushing and other hardware used in conjunction with the adjustment.
§129 Amend paragraph 3 of subdivision h of rule 1203.8 to read as follows:
Where an alteration is made to firefighters' service operation, the installation shall conform to the requirements of Rules 211.3 through [211.8] 211.9.
§130 Amend and re-designate paragraph 3 as 5 and add new paragraphs 3 and 4 to subdivision a of rule 1206.3 to read as follows:
(3) for counterweight cables of drum machines re-shackling at the counterweight ends, 4 years.
(4) In addition to foregoing requirements, rope fastenings shall be renewed when an inspection reveals any evidence of failure at the shackle regardless of the period of time since last re-shackling.
[(3)] (5) Where auxiliary rope-fastening devices conforming to the requirements of Rule 212.10 or where car hoist ropes with an additional MEA accepted type emergency clamping devices are installed, refastening at the period specified is not required provided that, where such devices are installed, all hoisting ropes shall be refastened on the failure or indication of failure of any rope fastening.
§131 Amend first paragraph of sub division c of such rule to read as follows:
1206.3c Tags. A metal tag (see Appendix K) shall be securely attached to one of the wire rope fastenings after each resocketing or changing to other types of fastenings, and shall bear the following information:
§132 Amend paragraph 6 of subdivision b of rule 1206.5 to read as follows:
(6) Flexible hose and fitting assemblies shall be replaced by the manufacturers' date indicated on the existing equipment but not less than six (6) years. Hose assemblies that do not indicate a replacement date shall be replaced. Replacement shall conform to requirements of Rule 303.3c (1)(e).
§133 Amend the first paragraph of rule 1207.1 to read as follows:
Rule 1207.1 General Requirements
Any alteration to an escalator shall comply with the requirements of Rules 805.1, 805.2, 805.3a, 805.3e, 805.3f, 805.3n, 805.3q, 805.7, 1200.1, and 1200.2
§134 Amend rule 1207.8 to read as follows:
Rule 1207.8 Combplates
Any alteration of the combplates shall require conformance with the requirements of Rules 805.3n and 805.3q.
§135 Amend the first sentence of the first paragraph of rule 1208.1 to read as follows:
Any alteration to a moving walk shall comply with requirements of Rules 905.2, 905.3a, 905.3e, 905.3f, 905.3k, 905.3l, 905.6, 906.2, 1200.1, and 1200.2.

§136 Amend subdivision a of rule 2000.7 to read as follows:

2000.7a Limitation of Load, Speed, and Travel. The rated load shall be not less than 450 lb (204 kg) or more than 750 lb (340 kg). The lift shall be capable of sustaining and lowering a load as specified in Rule 207.1. The rated speed shall not exceed 30 ft/min (0.15m/s). The travel shall not exceed [12ft (3658mm) nor] 25ft (7621mm) and shall not penetrate [a] more than one floor. Platforms with an area greater than 15 ft² (1.39 m²) shall have a rated load of not less than 750 lb (340 kg).

§137 Amend subdivision a of rule 2100.7 to read as follows:

2100.7a Limitation of Load, Speed, and Travel. The rated load shall be not less than 450 lb (204 kg) or more than [700] 750 lb (340 kg). Platforms with an area greater than 15 ft² (1.39 m²) shall have a rated load of not less than [700] 750 lb (340 kg).The lift shall be capable of sustaining and lowering a load as specified in Rule 207.1. The rated speed shall not exceed 30 ft/min (0.15 m/s). The travel shall not exceed [10 ft (3048 mm) nor] 25 ft (7621 mm) and shall not penetrate [a] more than one floor.

§138 Amend the first paragraph of Rule 2500.13 to read as follows:

When provided, power operation, power opening, and power closing of hoistway doors and car doors [and gates] shall conform to the requirements of Section 112, except as modified by this Rule.

§139 Amend subdivision a of such rule to read as follows:

(a) Rule 112.1(b). Vertically sliding doors are not permitted. Power operated swing hoistway doors shall not be permitted with power operated horizontal operated car doors.

§140 Amend paragraph 2 of subdivision a of rule 2501.8 to read as follows:

(2) The inside net platform area shall not exceed 18 ft² (1.67 m²) but not less than 4'X4' with a minimum 32 inches clear door opening. The C/O/P shall be on the strike wall.

§141 Delete Appendix G of ANSI/ASME A17.1-1996 in its entirety.

§142 Delete Appendix H of such standard and re-adopt it to read as follows:

APPENDIX H

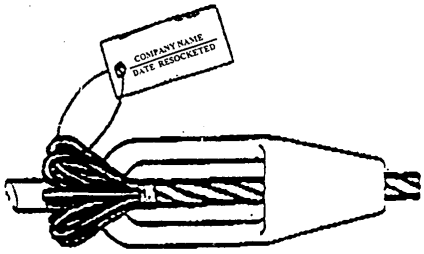
SIGNS AT ELEVATOR LANDINGS

Signs at elevator landings shall comply with the requirements of Section 27-391 of article nine of subchapter six of chapter 1 of title 27 of the administrative code.

§143 Add new appendix k to such standard.

APPENDIX K0

TAGS



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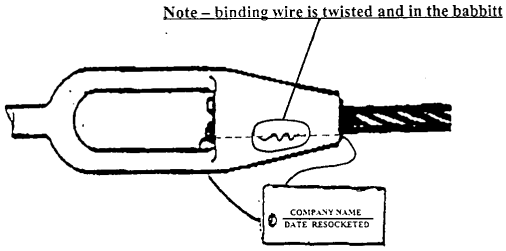

APPROVED METHOD

† DOB 1-16-03; 11-91 BCR

***REFERENCE STANDARD RS 18-3**

ANSI B153.1-1981 Safety Requirements for the Construction, Care and Use of Automobile Lifts.
FS 00-L-360D-1987 Motor Vehicle Lifts.
DOB 1-16-03; 11-91 BCR; 678-85 BCR; 385-82 BCR

*****REFERENCE STANDARD RS 18-4**

ANSI/ASME MH 14.1-1987 Loading Dock Levelers and Dockboards.
Modifications.-The provisions of ANSI/ASME MH 14.1-1987 shall be subject to the following modifications: The Section numbers are from that standard:
2.1.8 Lighting.-The entire operating area shall be illuminated to provide a distributed intensity of at least five (5) foot candles over the area of operating floor and platforms.
******11-91 BCR; 1156-80 BCR***

**** REFERENCE STANDARD RS 18-5**

ANSI/ASME B20.1- 1987 Safety Standards for Conveyors and Related Equipment.
Modifications.- The provisions of ANSI/ASME B20.1-1987 shall be subject to the following modifications. The Section numbers are from that standard:

6.21 Vertical Reciprocating Conveyers

6.21.2 Guarding

(e) Controls shall be installed or located so they cannot be actuated by a person on the carrier. Controls shall be of constant pressure type.
(f) Non-operating sides of the conveyer to be guarded to a minimum height of 7 ft. If guarding is fence or expanded metal the mesh must be capable of rejecting a 2" diameter ball. The guarding is required at both levels where the unit penetrates a non-fire rated floor.

6.21.3 Shaft enclosure

Where a vertical conveyer (material lift) penetrates a fire-rated floor a two (2) hour rated enclosure with one and a half (1½) hour rated self-closing fire doors shall be required.

6.21.4 Gates

(a) All lower and intermediate level manual loading and unloading points shall have gates with a minimum of six (6) ft in height. Each gate is equipped with a lock and electric contact to prevent the gates from being opened until the conveyer is at that level.
(b) Upper level gates must be with a minimum of six (6) ft in height and shall be equipped with a lock and electric contact.

6.21.5 Platform Side guards

Platform side guards and gate with electric contact shall be provided with a minimum of six (6) ft in height.

6.21.6 Limitation of Load

The capacity shall be not less than 50 lbs. per sq. ft with a maximum capacity of 2500 lbs.

6.21.7 Speed

The rated speed shall not exceed 25 ft/min (0.15 m/s).

6.21.8 Travel

The maximum travel shall not exceed 25 ft.

6.21.9 Floor Penetration

Not more than one floor penetration shall be permitted.

SECTION 7 OPENING PROTECTION

[7.01] 7.1 Passage through openings

[7.01.1] 7.1.1 Whenever a conveyer or other material-handling device is designed to pass through floors, ceilings, partitions or walls, the plans and specifications shall give the necessary details of the opening protection with respect to location, structural strength, and fire resistance in accordance with the requirements of the Building Code.

Section 5. This revision shall take effect immediately.

[ ] Matter shown in brackets to be deleted.
___ Matter shown underlined to be added.
{ } Matter shown in brackets replaces brackets [ ] of ANSI/ASME A17.1-1996 and ANSI/ASME 17.1A-1997, so that it is not understood as deletion.

Designations used in this revision is as follows:

Example is taken from PART X	
PART	X
SECTION	SECTION 1000
RULE	RULE 1000.3
SUBDIVISION	1000.3(b)
PARAGRAPH	1000.3(b)(1)

SUBPARAGRAPH 1000.3(b)(1)(b)
ITEM 1000.3(b)(1)(b)(1)
SUBITEM 1000.3(b)(1)(b)(1)(i)
Wherever "of such rule," "of such subdivision," etc., is used in any §#, they refer to "rule," "subdivision," etc. of the preceding §#.
***** DOB 1-16-03;11-91 BCR; 1156-80 BCR***

REFERENCE STANDARD RS 18-6
CONSOLE OR STAGE LIFTS
1. Platform or Car Construction.-
(a) Suspension or supporting frames of all console or stage lifts shall be constructed of structural steel, wrought iron shapes, or of any noncombustible material whose strength shall satisfy the loads and stresses requirements of the building code.
(b) The minimum factor of safety of all materials used in car platforms and slings shall conform to the requirements of reference standard RS 18-1.

2. Cables.-Hoisting cables shall have a safety factor conforming to the requirements of reference standard RS 18-1.

3 Hoisting.-Platforms may be operated by cables, plunger, or screw type equipment, and shall maintain a minimum factor of safety of all materials used in operating the platform conforming to the requirements of reference standard RS 18-1.

4. Control.-
(a) Up and down control shall be provided near the lift in a location where it can be easily operated and where the operator will have an unobstructed view of the lift.
(b) An emergency stop switch shall be provided within easy reach of the operator, and when operated, it shall cut off power from the hoisting equipment.

5. Entrance.-When the entrance to such console or stage lift is at one or more points below the stage level, such entrance or entrances shall be provided with a gate or door with mechanical lock and electric contact, or the platform shall be provided with an apron made of sheet steel or plywood covered with 26 gage sheet steel, at the entrance side or sides extending from the platform to below the lowest landing with the platform at its maximum raised position. If the platform rises above the stage level, all unguarded sides shall be provided with aprons extending from the platform to below the stage level.

***REFERENCE STANDARD RS 18-7**
ANSI A 10.-41981-Safety requirements for Personnel Hoists.
Modifications.-The provisions of ANSI A 10.4-1981 shall be subject to the following modifications:

Add the following sub-section to 25.10.2:
25.10.2.1 Thereafter the rack and pinion type personnel hoist shall be reinspected every ninety (90) days. The inspection shall include a full load test of the safety device.

Add the following sections to govern the installation, jumping and dismantling of rack and pinion type personnel hoists to Rule 26, Inspections and Tests of Personnel Hoists:
26.1.1.1 Installations of rack and pinion type personnel hoists shall be approved by the Elevator Division. Both a construction application and an elevator application shall be filed by a licensed professional engineer or registered architect. The drawings shall be sealed.
26.1.1.2 The Elevator Division shall be notified at least three (3) days before the inspection date prior to each "cathead" raise, when the travel of the hoist is increased. This inspection shall include the examination of the normal, terminal and final limit stopping devices. All parts of the equipment shall be inspected; and tested to determine that they are in safe operating condition where found necessary by the Elevator Division. A full load test may not be required at this time by the Elevator Division. If an Elevator Division Inspector cannot be present at the time the required tests are made, the qualified private elevator inspectional agency conducting the tests shall:
(1) Submit a statement upon a department form to the Elevator Division certifying the tests which have been conducted and the results thereof within 24 hours of such tests.
(2) Attach a tag showing the date of the tests and the name of the person and/or agency conducting it.
26.1.3.1 Acceptance inspections of new installations shall be made prior to use by the contractor. The Elevator Division shall be notified at least three (3) days before the required acceptance inspection and test. A full rated load test shall be made. All shaftway protection doors, ramps, guards and required safety devices shall be installed and in place. The contractor may apply upon successful completion of the inspection and test for a ninety (90) day temporary elevator certificate (B Form 256).
26.2.1.1.1 All rack and pinion type safeties shall be stamped with their expiration date by the manufacturer and shall be replaced when such date is expired which shall not exceed a period of three (3) years.
26.7 Materials Handling Plan. A materials handling plan shall be provided if a potentially hazardous condition exists because of simultaneous operation of the rack and pinion personnel hoist and either a crane and/or derrick.
26.7.1 The materials handling plan shall be acceptable to Site Safety Coordinator and approved by the Department.
26.7.2 The hoist contractor and the safety coordinator shall be jointly responsible for the enforcement of the provisions of the materials handling plan.
26.8 Dismantling and Removal. The Elevator Division shall be notified on department forms when a rack and pinion type hoist is dismantled and removed.
26.8.1 The notification shall include the elevator application number, the street address locations listed on the construction application, the block and lots and the date of removal.

26.9 Field Inspection. A department field inspection will be scheduled by the Elevator Division upon receipt of proper notification to ascertain the actual job-site conditions and to sign-off the forms documenting the same.

Add the following to Rule 30:
Electrical work shall conform to the New York City Electrical Code.
Welding shall conform to the applicable portions of the Administrative (Building) Code.
678-85BCR

REFERENCE STANDARD RS 18-8
POWER OPERATED SCAFFOLDS

1. Construction Requirements for the Scaffold.-

(a) The scaffold shall be constructed of steel conforming to reference standard RS 18-1, rules 203.6(a), (b), (c), and 203.7, or of equivalent metals.
(b) A railing with an intermediate horizontal rail, shall be provided on all four sides of a scaffold. The railing shall be at least 36 in. high on the building side and at least 42 in. high on the other three sides. Design of the guard rail at or near both ends of the scaffold shall include provisions for mounting roller guides.
(c) The spaces between the top guard rails and the scaffold toe board on the outside railing and the end railings shall be filled with metallic mesh, expanded metal, or similar material that shall reject a ball 1 in. in diameter and that shall be capable of withstanding a horizontal force of 75 lbs. at any point with a maximum deflection of 1 in. The railing on the building side shall have mesh below the intermediate rail only.
(d) A solid metal toe board, at least 4 in. high, shall be provided at the floor on all four sides. The bottom of the toe board shall be flush with floor. The toe board shall be capable of withstanding a horizontal force of 75 lbs. at any point with a maximum deflection of 1 in.
(e) A hinged access gate shall be provided in the scaffold railing on the building side. The gate shall be of construction similar to the railing, and the open spaces in the gate shall be filled with material as prescribed in (c) above. With the gate open, the clear width of access shall be at least 18 in.
(f) The gate shall be provided with an interlock that will prevent power operation of the scaffold when the gate is in the open position.
(g) The scaffold dimension parallel with building shall be designated the "length," and shall be measured between the inside surface of the end railings. The dimension perpendicular to the building wall shall be designated the "width," and shall be measured between the inside railing surfaces on the long sides of scaffold. The width of a scaffold shall be at least 28 in. When the building side of the scaffold is of irregular shape, following the contour of a building wall, scaffold "width" shall be measured at the tightest point of the irregularity.
(h) The rated load of a scaffold shall be 50 plf. The maximum number of occupants permitted simultaneously on a scaffold shall be equal to the inside clear length divided by 5.
(i) The maximum permissible vertical scaffold speed shall be 50 fpm.
(j) The scaffold floor shall have an anti-slip surface with air passage interstices, which must reject a 1/2 in. diameter ball, and shall be designed for a uniform live load of 75 psf. The floor and its supports and bracings shall be able to withstand a concentrated load of 300 lbs. on any random 4 sq. in. of floor area with a maximum deflection of 1/1666 of the span.
(k) A manufacturer's rating plate shall be mounted conspicuously near the access gate on the scaffold. The plate shall be made of non-corrosive material with letters at least 1/4 in. high etched, stamped, or cast on the surface. It shall state the rated load, the maximum number of occupants, and the manufacturer's name and model number.

2. Construction and Design Requirements for Roof Carriage.-

(a) A movable roof carriage and track system shall be provided to move the scaffold in a horizontal direction. The maximum permissible horizontal speed of the roof carriage shall be 50 fpm.
(b) The roof carriage shall be constructed of steel conforming to reference standard RS 18-1, rules 203.6(a), (b),and (c), and 207.7, or of equivalent metals, welded, riveted, or bolted together. The roof carriage construction shall be capable of supporting the scaffold and its rated load plus impact loads imposed by motor stall torque and wind forces with a safety factor conforming to reference standard RS 18-1, rules 203.10 and 203.11.
(c) The design of the roof carriage, track, and track support system shall include means to accurately stop and position the roof carriage at predetermined locations that correspond to the locations of the vertical guides on the building wall.
(d) When the roof track system is not a continuous loop and terminal track ends exist, mechanical end barricades shall be provided together with terminal limit switches.
(e) In the design of roof components of buildings where suspended scaffolds and movable roof carriages are to be used, all forces transmitted to the building structure by such equipment shall be added to normal design loads.

3. Stability of Roof Carriage.-The roof carriage and its support system shall be designed and constructed for structural adequacy and required stability to resist overturning moments occurring with a scaffold carrying its full rated load.
(a) Windforce: 30 psf.
(b) All imposing forces that are caused by moving loads shall be doubled for impact.
(c) If the roof carriage is of open structure type, the effect of windforce or interior components shall be considered as the sum of all framing components areas plus mounted equipment areas projected on a plane perpendicular to the wind direction. No component shall be considered as shielding another component along the wind direction if the separating distance is more than 4 times the smallest

dimension of the windward component.

4. Access for Inspection and Maintenance.-Safe and convenient means of access between roof and roof carriage and between roof carriage and scaffold shall be provided, conforming where applicable to reference standard RS 18-1, rule 101.3.
(a) On installations where movable roof carriages are used, the means of access shall be a permanent part of the carriage design and shall be constructed so as to permit stepping on or off the carriage to or from the roof at any carriage position.
(b) Means of access between a movable roof carriage and its scaffold shall be possible only with the scaffold raised to its top position. Electrical interlocks in the carriage drive motor circuit, and actuated by the scaffold, shall prevent carriage movements until scaffold is in access position.

5. Vertical Guiding of Power Operated Scaffolds.-
(a) Power operated scaffolds shall be guided up and down the face (facade) of a building or structure.
(b) The guiding means shall consist of roller guide shoes engaging vertical guide rails securely attached to the structural members.
(c) Each vertical guide shall be engaged by an upper and a lower roller guide shoe securely attached to the scaffold and its suspension frame. Roller guide shoes shall be spaced at least 48 in. apart vertically. Where the platform is suspended at two points at each end, the vertical guides may be engaged by one guide shoe only.
(d) The two ends of the scaffold shall be supported and hoisted or lowered simultaneously, and means shall be provided to maintain the scaffold approximately at level position at all times to prevent the roller guide shoes from binding on the vertical guides. Out-of-level slope shall not exceed 1/4 in. in 12 in.
(e) Materials for vertical guides, suspension frame, and fastenings shall conform to applicable portions of reference standard RS 18-1, section 200.

6. Construction and Design Requirements for Hoist Machines.-
(a) A hoist machine, whether mounted on the scaffold or the roof carriage, shall be designed and constructed to maintain its component parts in correct alignment to effectively transmit the imposed drum load into the supporting structure.
(b) Wire ropes shall lead from the drums through suitable fairleads to suspension points when the hoist machine is mounted on the scaffold. Wire ropes shall lead from the drums over suitable deflecting sheaves mounted on outriggers from the roof carriage when the hoist machine is located in the roof car.
(c) Chains, clutches, or friction gearing belts shall not be used to connect the drive motor to the winding drum. It shall be necessary to power drive the drive machine to either raise or lower the scaffold.
(d) Drive motors shall meet the requirements of the electrical code of the city of New York and shall:
(1) Lift the scaffold with 125 percent of the rated load at the rated speed with maximum temperature rise of 50 degrees C. per hr.
(2) Provide dynamic braking.
(3) Be of weatherproof construction with the motor shaft connected to the input shaft of the speed reducer through a coupling capable of transmitting the motor stall torque.
(e) Guards.-All moving, power transmitting, and interacting components of the drive machines shall be effectively guarded to conform to applicable portions of the requirements of rule 19 of the industrial code of the state of New York.
(f) Brakes.-Each hoist machine shall be provided with at least two friction brakes applied by a spring or springs and released electrically.
(1) Each brake shall be able to stop and hold the dead weight of the scaffold and 125 percent of the rated load.
(2) The drum brake shall be adjusted to apply not later than 2 seconds after the drive motor brake at every stopping operation.
(3) At least one brake shall be located at, and applied directly to, the winding drum or an equal strength extension of it. This brake shall have the additional function of reacting to a 40 percent over-speed actuated by an inertia device or a speed governor, either of which must be reset manually.
(4) The second brake shall be located at, and applied on either side of the motor.
(5) All parts of the brakes shall be readily accessible for inspection and cleaning.
(g) Gearing.-Hoist machines shall be provided with speed reducers between the drive motor and the rope drum. Such speed reducers shall be of the meshing gear type, worm and worm gear type, spur gears type, bevel gears type, or a combination of these types. The speed reducer shall be fully enclosed, adequately lubricated, and sealed to prevent leakage.
(1) Such speed reducers shall conform to the requirements of the American Gear Manufacturers Association as listed in Reference Standard RS 18-1, Part XVI.
(2) Material used for gears and shafts in speed reducers shall conform to reference standard RS 18-1, Section 208.
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(3) The gearbox shall be provided with oil level indicators and removable cover plates or plugs to permit visual inspection of the full width of the faces of the gear teeth.
(4) A data plate of a material resistant to weather and other corrosive agents shall be mounted on the gearbox, and shall bear the following information etched or stamped in 1/8 in. high letters:
Mechanical horsepower.....
Input speed.....R.P.M.
Output speed.....R.P.M.
Service factor.....
Type of lubricant.....
Quantity of lubricant.....Gallons
(h) Drums.-Drums for winding up suspension ropes shall have grooves or contact surfaces capable of withstanding the imposed rope pressure without deformation.

(1) The pitch diameter of the drum shall be at least 40 times the diameter of the rope wound on it.
(2) When grooved drums are used and single or multiple layers of rope are wound on the drum, the groove spacing or distance from centerline-to-centerline of adjacent grooves shall be at least 1/16 in. plus the rope diameter.
(3) When a drum without grooves is used and single or multiple rope laying is employed, a level winding device shall be provided to maintain the rope in close wound, parallel lays.

7. Suspension Means and Their Attachment.-Scaffolds shall be suspended by steel wire ropes, with at least one rope supporting the scaffold at, or near, each end. When winding drums are located at the top of travel, the suspension rope fastenings shall be attached to the scaffold; when winding drums are located on the scaffold, the suspension rope fastenings shall be attached to supports at the top of travel; and when a hoist machine with a continuously rotating traction sheave is used at each end of the scaffold, the single suspension rope shall have at least 4 turns on the sheave for minimum lifting effect, and the rope length shall be equal to the total scaffold travel plus 8 ft. For each suspension rope, an adjacent safety suspension rope shall be provided. The safety suspension rope shall normally run free through a clamping device, that is part of the machine, and the clamping device shall be arranged to automatically grasp and hold the safety rope upon failure of the hoist rope.
(a) Only steel wire ropes with fiber cores, having the commercial classification "elevator wire rope" and of minimum grade "improved plow steel" shall be used for the suspension of scaffolds.
(b) Rope data tag information shall conform to the requirement of reference standard RS 18-1, rule 212.2b.
(c) The number of suspension ropes used, the diameter of the ropes, and the factor of safety shall conform to requirements of reference standard RS 18-1, rule 212.3.
(d) The minimum rope diameter shall be 5/16 in.
(e) Securing of wire rope to winding drums shall conform to requirements of reference standard RS 18-1, rule 212.6.
(f) At least 3 turns of rope shall remain on the winding drum when the scaffold is at the bottom of travel.
(g) Suspension wire ropes shall not be lengthened or repaired by splicing.
(h) Suspension wire rope fastenings at free ends shall conform to the requirements of reference standard RS 18-1, rules 212.9(a), (b), (c), (d), (e), and (f).
(i) Suspension ropes shall be provided with a rust-resistive coating.
(j) Reverse bends in the roping arrangement should be avoided. More than two reverse bends in each rope shall be prohibited.
(k) Means shall be provided to stabilize the suspension ropes to prevent sway and abrasion and, in all cases, such means shall be provided for every 300 ft. of scaffold travel**.**

8. Operating Devices and Control Equipment.-
(a) All electrical operating devices shall be of the constant pressure or dead man type with weather proof enclosure. To prevent unauthorized use, the constant pressure device shall be key operated or protected by a padlock cover.
(b) All electrical equipment and wiring shall conform to the requirements of the electrical code of the city of New York.
(c) The normal operating devices for the vertical movement of the scaffold shall be located on the scaffold and shall be operable only when all electrical protective devices and interlocks on the scaffold are in position for normal service.
(d) The operating device of a power operated roof carriage for horizontal traversing shall be located on the roof carriage. This operating device shall be connected so that it will not be operable until the scaffold is raised to its uppermost position of travel and is disengaged from the building face or guiding rails on the building face and all protective devices and interlocks, on both the roof carriage or scaffold mounted hoist machine, are in position for traversing.

9. Traveling Cable.-
(a) Conductors for control, power, communication, signal, and ground may be run in a single traveling cable, provided that the cable conforms to the requirements of rule B30-166.0(i) of the electrical code of the city of New York.
(b) Traveling cables exceeding 100 ft. in length shall comply with rule B30-69.0 of the electrical code of the city of New York.
(c) The traveling cable shall be provided with a tensioning device to prevent uncontrolled cable sway, to protect the cable against abrasion, and to automatically prevent overtensioning of the cable. The tensioning device and cable drum shall be mounted in a weatherproof housing.

10. Electrical Protective Devices and Interlocks.-
(a) An overtensioning or tightrope device shall be connected into the drive motor circuit in a manner that will cause it to react to an overload and disconnect electric power to prevent upward pull on ropes if the scaffold becomes wedged in its tracks or is otherwise impeded while being raised.
(b) A slack rope device shall be provided that will react to a slackening of rope tension and disconnect electric power from drive motor to prevent the drum from overhauling the suspension rope if scaffold's downward motion is interrupted.
(c) Limit switches shall be provided at the top and bottom terminals of scaffold travel and shall be connected into the control circuits of the drive motors and actuated by cams at both ends of the scaffold and the roof carriage. Cam engagement of a limit switch at any travel terminal shall remove electric power from the motor circuit, and shall apply the brake to stop the scaffold or roof carriage.
(d) Hoist machine winding drums shall be provided with stop motion limit switches of the traveling nut type or equivalent. Such stop motion limit switches shall be connected to the drum shaft and set to open the operating circuit of the motors simultaneously with the cam operated

final terminal travel limit switches.
(e) All electrical mounting boxes, conduits, piping, and junction boxes, and the controller frame, hoist machinery frame, roof carriage track system, and scaffold shall have a ground connection through a ground wire in the scaffold traveling cable and by a third rail contact or cable with a tensioning device for the roof carriage.

11. Power Supply System.-Electrical equipment and wiring for the power supply system shall conform to the applicable requirements of the electrical code of the city of New York.

12. Emergency Communication with Men on Scaffold.- Communication equipment shall be provided for each power operated scaffold to facilitate rescue operations in an emergency and shall consist of either:
(a) A telephone instrument mounted on the scaffold and connected through wires in the traveling cable to a manned instrument in the building and, in addition, a battery or hand operated air horn or other signalling device not requiring electricity to operate.
(b) A two-way radio telephone system with the receiving instrument in the building constantly manned during the operation of the scaffold and in addition, a battery or hand operated air born or other signalling device not requiring electricity to operate.

13. Special Maintenance.-
(a) Suspension ropes shall be examined, lubricated, and shackled or reshackled to conform to ANSI A17.2-1979
(b) Control mechanisms, switch panels, relay panels, and similar electrical operating equipment shall be examined and maintained to conform to ANSI A17.2-1979
(c) A continuous record of modifications and changes of equipment shall be kept on the premises for inspection and review by the commissioner.
(d) A complete and continuous record of operations shall be maintained, in which shall be recorded, regular maintenance procedures, and malfunctions, repairs, and emergencies.
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****REFERENCE STANDARD RS 18-9**
ANSI/ASME A90.1 1985-Safety Standards for Belt Manlifts.
*****Local Law 65-1969; 11-91BCR; 1156-80BCR***

*****REFERENCE STANDARD RS 18-10 AMUSEMENT DEVICES**
*** TABLE OF CONTENTS**

Section Subject

TEXT

PART I GENERAL PROVISIONS

***1.0 PURPOSE, INTENT AND GENERAL REQUIREMENTS**. The purpose of this Reference Standard is to supplement the provisions of Subchapter 18 of Chapter 1, Title 27 of the Administrative Code of the City of New York "(Code)," entitled Elevators and Conveyors pertaining to the inspectional and test requirements for amusement devices and to establish the minimum safety requirements for, and control of the design, construction, installation, alteration, maintenance and operation.

***2.0 SCOPE AND APPLICATION**. These Reference Standards shall be applicable to all amusement devices operated within the City of New York whether located on a permanent, temporary, or mobile foundation. See Section 643 of the New York City Charter.

2.1 This Standard shall not apply to:

2.1.1 Any single passenger manually, mechanically or electrically operated, coin-operated device which is customarily placed, singly or in groups, in a public location and which does not normally require the supervision or services of an operator; and

2.1.2 Locomotives weighing more than seven tons, operating on track the length of which is O mile or greater, the gage of which is three feet or greater, and the weight is at 60 pounds per yard; and

2.1.3 Mobile type devices, self-contained and mounted on a motor vehicle or trailer not requiring further assembly or support, shall not be subject to this standard.

***3.0 DEFINITIONS.** These definitions are in addition to those set forth in the Code §27-232.

*3.1 ACCIDENT. See Code §27-1006. An injury to any person requiring the services of a physician or damage to property or to apparatus exceeding $100.

*3.2 AMUSEMENT DEVICE. A mechanically operated device or structure, open to the public, used to convey persons in any direction as a form of amusement. For the purpose of these reference standards, the word mechanically shall read mechanically and/or electrically operated.

3.3 AMUSEMENT DEVICE FOR CHILDREN. An amusement device designed for children twelve years of age and under.

3.4 CHILD. A person 12 years of age and under.

3.5 CONTAINING DEVICE. A strap, belt, bar, gate or other safety device designed to prevent accidental or inadvertent dislodgement of a passenger from a device but which does not actually provide physical support.

3.6 DEVICE OPERATOR. Any person or persons actually engaged in or directly controlling the operations of an amusement device.

3.7 GUARDIAN. A person 16 years of age and over.

3.8 GUARDIAN RESTRICTION. A condition placed on an amusement device where a passenger must be accompanied on the device by a guardian.

3.9 HEIGHT RESTRICTION. A statute requirement for passengers to be permitted on a specific amusement device which is contained on the list of height restrictions maintained by the Commissioner in accordance with subsection 4.6 of this Standard.

3.10 NATIONALLY RECOGNIZED TESTING AGENCY. A laboratory, such as the Underwriters Laboratories, Inc., or the Factory Mutual Engineering Corporation or any similar testing organization acceptable to the Commissioner.

*3.11 NON-DESTRUCTIVE TESTING. A general term used to identify inspection methods that permit evaluation of welds, structural members and joints without destroying their usefulness.

*3.12 OPERATOR. A competent individual designated by the owner, who shall be at least 18 years old, free from serious physical or mental defects, selected with consideration of his abilities to perform his duties on an amusement device, in a careful and competent manner, who has met the requirements for a Certificate of Competency set forth under Policy and Procedure Notice #3 of 1993 in accordance with Code §27-1005.

*3.13 OWNER. A person having legal title to the premises; a mortgagee or vendee in possession; a trustee in bankruptcy; a receiver or any other person having legal ownership or control of premises. For the purpose of these reference standards, the word premises shall read premises and/or amusement device.

*3.13.1 OWNER. Also the person who manages the operations of the amusement device.

*3.14 PASSENGER TRAMWAY. A device used to transport passengers in cars on tracks or suspended in the air, by use of steel cables, chains or belts or by ropes, and usually supported by trestles or towers with one or more spans.

*3.15 PERMANENT. Lasting for a period of time exceeding two (2) weeks.

*3.16 PORTABLE. Devices which by mounting on a motor vehicle or trailer are made mobile and which require additional assembly or support for operation. Their usage may be permanent or temporary.

*3.17 RESTRAINING DEVICE. A safety belt, harness, chair, bar or other device which affords actual physical support, retention or restraint to the passenger of an amusement device.

*3.18 SHALL. A mandatory requirement.

*3.19 STRUCTURE. An assembly of materials forming a construction for occupancy or use, including among others: buildings, stadia, tents, reviewing stands, platforms, stagings, observation towers, radio towers, tanks, trestles, open sheds, coal pockets, shelters, fences and display signs.

*3.20 TEMPORARY. Lasting for a period of time not to exceed two (2) weeks.

*4.0 COMPLIANCE. Every owner, device operator and the public using an amusement device shall comply with or effect compliance with all provisions of applicable sections of the New York City Administrative Code and these reference standards.

*4.1 An amusement device which is not in compliance with these reference standards shall not be used
or occupied, except as provided in 4.2.
*4.2 Where only individual units or a device, such as cars, seats or other carriers are defective and not
in compliance with these reference standards, such units shall be taken out of service and clearly marked with a sign reading Out of Service provided however, such defects do not jeopardize the safety of the entire device.
4.3 The owner of an amusement device shall not permit a person who in the judgement of the operator of the ride appears to be under the influence of alcohol or narcotics to enter any amusement device.
4.4 The Commissioner shall classify all amusement devices either an "Amusement Device" or as an "Amusement Device for Children."
4.5 The Commissioner shall reserve the right to establish the height restriction, guardian restriction, and classification of any device.
4.6 The Commissioner in accordance with subsection 4.5 of this section shall maintain a list of approved heights for children 12 years of age and under for specific amusement devices other than those designed for them.
4.7 The owner of an amusement device shall not permit a passenger under the approved height on such list; or
4.7.1 The passenger being a child not meeting the approved height restriction, is accompanied, elbow to elbow or front to back on the ride by a guardian.

*5.0 PERIODIC INSPECTION AND TEST INTERVALS. Every new and existing amusement device shall be inspected and tested in accordance with the provision of Code §27-998.
5.0.1 An amusement device may be used and operated for a period not to exceed six (6) months from the date of the last satisfactory periodic inspection and test, unless otherwise noted. The Commissioner may extend the periodic inspection and test for an additional two (2) months for amusement devices located in premises which are seasonably operated.
5.0.1.1 An amusement device which has been assembled and disassembled shall be inspected and tested as required by the Department after reassembly prior to its use and operation, regardless of the date of the previous inspection and tests. However, for portable devices, a prior load test inspection certificate from a cognizant state or city agency coupled with an affidavit that the test set-up is representative of the permitted operating conditions at the site based on said test may be accepted. The affidavit shall also state that all of the work necessary to retain it in the same structural situation has been performed.
5.0.1.2 An amusement device which has been altered, based upon an approved application and permit issued by the department, shall be inspected and tested.
5.0.1.3 An amusement device which has been relocated shall be inspected and tested after each relocation, as required by the department, prior to its use and operation, regardless of the date of the previous inspection and tests. However, for portable devices, a prior load test inspection certificate from a cognizant state or city agency coupled with an affidavit that the test set-up is representative of the permitted operating conditions at the site based on said test, may be accepted. The affidavit shall also state that all of the work necessary to retain it in the same structural situation has been performed.
5.0.1.4 An amusement device shall be inspected and tested, regardless of the date of the previous inspection and tests, when there are reasonable grounds to believe that such tests are necessary to assure safety and the commissioner or his representative orders such tests to be made.
*5.0.1.5 All permanent amusement devices requiring a load test and which operate seasonally for less
than nine months shall require two field inspections by authorized representatives of the Department. The first inspection shall take place prior to the opening day of the amusement device and the second inspection shall take place no sooner than 90 days nor later than 120 days from the first inspection.
5.0.2 Notification of the proposed date of the regular periodic inspection and test shall be made to the department at least one week prior to the scheduled date by the owner of the amusement device or by the person or firm conducting the inspection and test.
*5.0.3 Refer to Code §26-213c for required fees for inspection and tests, and for permits to use and operate amusement devices.

*5.1 INSPECTION AND TEST REQUIREMENTS. Every new and altered, rebuilt or modified amusement device shall be subjected to inspection and test requirements in accordance with the provisions of Code §27-999(c) and these reference standards.
5.1.1 Such inspections and tests shall be conducted by the person or firm installing, assembling, altering or relocating the amusement device and shall be witnessed by an authorized representative of the commissioner.
5.1.2 The results of the inspection and test for each amusement device shall be filed together with the required fee with the department by the person or firm conducting the inspection and tests. All such reports shall contain the following:
*5.1.2.1 The name, address and signature of the person conducting the inspection and test. All applications, plans, reports which are required to be submitted by a licensed Professional Engineer ("PE") or Registered Architect ("RA") shall be signed and sealed.
5.1.2.2 Trade or descriptive name of the amusement device and model number, if any, together with any identifying numbers.
5.1.2.3 The name and address of the manufacturer.
5.1.2.4 The date of the inspection and tests.
5.1.2.5 The maximum safe number of passengers and the maximum safe speed.
5.1.2.6 The results of the inspection and tests and a statement whether the results indicate confirmation as to the adequacy of the amusement device.
5.1.2.7 The results of the air compressor tank test and a statement whether the results indicate compliance.
* 5.1.2.8 There shall be kept with all permanent amusement

devices requiring a load test, a maintenance or operational manual containing the recommended foundations. If the manual does not contain the required foundations, then a plan and design of the footings prepared by a PE or RA licensed in the State of New York shall be prepared and retained with the device. Said plan shall indicate the size and pressure under the footings and allowable soil bearing capacity. In the case of existing permanent amusement devices with a device number issued by the Department of Buildings, compliance with this requirement will be delayed until March 1, 1997, provided an affidavit is submitted by the owner of the amusement device to the Department prior to June 30, 1996 indicating the name of the PE or RA retained to prepare the plans.

* 5.1.2.9 For the installation of temporary amusement devices requiring a load test, the owner of the amusement device shall submit the proposed foundations as recommended in the maintenance or operational manual of the amusement device to the Department of Consumer Affairs together with any amusement device license application. If the manual does not contain the proposed footings for varying underlying conditions, a plan and design of the footings shall be submitted to the Department of Consumer Affairs prepared by a PE or RA licensed in the State of New York. The plan shall indicate the size and pressure under the footings and allowable soil bearing capacities and a copy shall be kept with the amusement device. A valid New York State "Permit to Operate an Amusement Device" may be submitted in lieu of the above.

*5.1.2.10 The name and signature of the authorized representative of the commissioner who has witnessed the inspection and tests.

*5.2.1 OPERATION, MAINTENANCE, INSPECTION AND TEST RECORDS Effective March 15 1997, the owner shall retain on-site for the preceding one year, current operation maintenance inspection and test records for each amusement device which is available to and acceptable to the Commissioner. Such records shall be kept up to-date at all times.

*5.2.1.1 All operations, maintenance, inspection and tests shall be performed in accordance with the manufacturer's manuals. Where such manuals are not available a PE or RA licensed in any jurisdiction acceptable to the Commissioner shall determine the necessary operation, maintenance, inspections and tests. Such manuals shall be prepared in accordance with ASTM F770-88, F846-92 AND F853-91. In the case of existing permanent amusement devices with a device number issued by the Department of Buildings, compliance with this requirement will be delayed until March 1, 1997 provided an affidavit is submitted by the owner of the amusement device to the Department prior to June 30, 1996 indicating the name of the PE or RA retained to prepare the manuals.

*5.2.1.2 For temporary amusement devices the owner shall submit to the Department of Consumer Affairs, together with the amusement device license application, an affidavit in a form acceptable to the Commissioner that all necessary operation, maintenance, inspection and tests required by the manufacturer or the PE or RA pursuant to Section 5.2.1.1 have been performed for three (3) months prior to its present location. The affidavit shall contain the locations and dates of operation, maintenance, inspection and tests for the required 3 month period.

5.2.2 These records shall contain the following information:

* 5.2.2.1 Date and nature of all inspections whether by the Department or the owner.

5.2.2.2 Any violation and type of action taken to rectify the violation.

*5.3 **NONDESTRUCTIVE TESTING FOR PERMANENT DEVICES REQUIRING A LOAD TEST.**

* 5.3.1 All permanent amusement devices requiring load tests shall be inspected annually prior to the start of the season by nondestructive methods by a laboratory under the supervision of a PE or RA licensed in the State of New York or by authorized representatives of the manufacturer. The tests shall be performed in accordance with ASTM 3.03 (1995) Standards for Nondestructive Testing.

* 5.3.1.1 All personnel performing nondestructive tests shall be qualified by experience, education and examination in accordance with ASNT December 1992. SNT-TC-1A for Level II.

* 5.3.1.2 Prior to performing any tests the entire amusement device and supporting structure shall be visually inspected. The inspection of the amusement device shall be in the disassembled configuration where possible, in order to be able to inspect critical areas which cannot be seen or reached in the assembled configuration.

* 5.3.1.3 The parts of the amusement device and supporting structure subject to nondestructive testing shall be as recommended by the manufacturer. Where the manufacturer's recommendations are not available a PE or RA shall determine the parts of the amusement device and supporting structure which shall be tested in accordance with ASTM F846-92 and shall select the appropriate test method.

* 5.3.1.4 The laboratory or authorized representative of the manufacturer shall submit a test report to the Department of Consumer Affairs together with any amusement device license application and shall identify the ride tested, the Department of Consumer Affairs license number and the location of the tested areas. If the manufacturer or the PE or RA does not recommend any nondestructive testing then an affidavit reflecting such recommendation shall be submitted by the owner with evidence acceptable to the Commissioner of Buildings.

* 5.3.1.5A weld that fails inspection shall be reported to the Department and shall be repaired by a licensed New York City welder. Where the welding work is not performed in the City of New York, welds shall be made by AWS qualified welders. A part such as a pin, axle or tension strap that fails inspection shall be removed and a new or repaired part shall be used as a replacement. The location of failed joints and parts shall be noted on the report to the Department. No amusement device shall be placed into operation until necessary repairs are made and the repaired parts retested.

*5.4 NONDESTRUCTIVE TESTING FOR TEMPORARY DEVICES REQUIRING A LOAD TEST.

*5.4.1 The requirements set forth in Section 5.3 shall be applicable to temporary amusement devices except that all temporary amusement devices requiring load tests shall have had a nondestructive test within one year prior to use of the amusement device in New York City. For temporary rides a valid New York State "Permit to Operate an Amusement Device" may be submitted in lieu of the affidavit referenced in Section 5.2.1.2 as evidence of compliance with nondestructive testing.

*5.4.1.1 In addition, the requirements set forth in Section 5.3 may be met by a licensed PE or RA of any jurisdiction acceptable to the Commissioner.

*5.5 The Commissioner may waive the requirements of Section 5.3 for a period not to extend beyond December 31, 1996 for existing permanent amusement devices with a device number issued by the Department of Buildings and the manufacturer's manuals are not available.

PART II DESIGN AND CONSTRUCTION

6.0 DESIGN.

6.0.1 All structures used in connection with amusement shall be so designated and constructed as to carry safely all loads to which such structures may normally be subjected.

*6.0.2 All amusement devices shall be designed, constructed and installed so as to withstand any normal stresses to which they may be subjected.

*6.0.3 Before being used by the public, amusement devices shall be so placed or secured with blocking, cribbing, outriggers, guys or other means as to be stable under all operating conditions.

*6.0.4 All amusement devices, such as, but not limited to, passenger tramways, where restoration of electrical power could create a hazard, shall be provided with a main disconnect switch capable of being locked only in the Off position.

*6.0.5 The path of travel of an amusement device shall have a clearance adequate to insure that a passenger on the device cannot be injured by contacting any structural member or other fixed object when the passenger is in the riding position.

*6.0.6For any new amusement devices manufactured after January 1, 1997, or whenever any additions or alterations are made to any amusement device after January 1, 1997 which changes the structure, mechanism or capacity of any amusement device which requires a load test, a PE or RA shall submit signed and sealed plans of the amusement device to the Department and shall contain design data, safety factors, materials utilized, stress analysis and other pertinent data. The Department's review and acceptance of said plans shall be conveyed by the owner to the Department of Consumer Affairs. The owner shall indicate on its application for an amusement device license whether the device was manufactured or altered after January 1, 1997.

*6.0.6.1 Such stress analysis shall include the affect of forces generated by acceleration, deceleration, centrifugal action or kinetic or other forces which are constant, reversible or eccentric. Materials and other data pertinent to the design, structure, factors of safety or performance characteristics shall be in accordance with accepted engineering practices, standards and specifications acceptable to the Department, and written in English.

*6.0.6.2 Such plans, dimensioned to scale, shall identify parts and components of amusement devices including, but not limited to the following:

*6.0.6.2.1 Bars
*6.0.6.2.2 Cables
*6.0.6.2.3 Chains
*6.0.6.2.4 Ropes
*6.0.6.2.5 Rods
*6.0.6.2.6 Pipes
*6.0.6.2.7 Girders
*6.0.6.2.8 Braces
*6.0.6.2.9 Fittings
*6.0.6.2.10 Fasteners
*6.0.6.2.11 Trusses
*6.0.6.2.12 Pressure vessels
*6.0.6.2.13 Pressure piping
*6.0.6.2.14 Gears
*6.0.6.2.15 Clutches
*6.0.6.2.16 Speed reducers
*6.0.6.2.17 Welds
*6.0.6.2.18 Bearings
*6.0.6.2.19 Couplings
*6.0.6.2.20 Shaftings
*6.0.6.2.21 Carriers, such as tubs, cars, chairs, gondolas, or seating and carrying apparatus of any description
*6.0.6.2.22 Axles
*6.0.6.2.23 Hangers
*6.0.6.2.24 Pivots
*6.0.6.2.25 Safety bars, belts, harnesses, chains, gates or other restraining, containing, or retaining devices

*6.1 MUSEMENT DEVICE ENTRY AND DISCHARGE. Safe and adequate means of entry and discharge from each device shall be provided. This safe and adequate means of entry and discharge shall not be construed to means of exits, means of access, means of egress.

6.2 MEANS OF ACCESS AND EGRESS.

*6.2.1 Safe and adequate means of access and egress from amusement devices shall be provided.

*6.2.2 At least two means of egress remote from each other shall be provided from each floor, tier, room or balcony in structures which house amusement devices.

6.2.3 Access to the means of egress shall be marked by readily visible signs in all cases where it is not immediately visible to the passengers.

6.2.4 No means of egress shall be less than 22 inches in width.

6.2.5 The width of a stairway shall be taken as the length of the treads between stringers. The width of a doorway shall be taken as the width of the door.

6.2.6 The maximum travel distance from the most remote

point in any room or enclosed space to an open safe outside space shall be not greater than that listed below:
6.2.6.1 100 feet in unsprinklered construction,
6.2.6.2 150 feet in sprinklered construction, and
6.2.6.3 25 feet in dead ends.
6.2.7 Means of access and egress shall have protection from adjacent hazards and protection from falling by use of rails, enclosures, barriers or similar means.
6.2.8 Means of access and egress shall be free from debris, obstructions, projections and slipping, tripping and other hazards.
6.2.9 The head clearance in passageways shall not be less than 7 feet.
*6.2.10 Means of access or egress shall have either stairways or ramps and connecting landings or platforms where the public enter or leave an amusement device, that is above or below grade with proper handrails and guards.
6.2.11 Stairways, passageways, ramps, landings or platforms shall be not less than 22 inches in width for single lane passage or 44 inches for double lane passage. Landings or platforms shall not be less than 3 feet long measured in the direction of travel.
*6.2.12 Stair treads shall be at least nine inches deep exclusive of nosing and the height of rise shall not exceed eight inches. Between any two connecting levels the treads shall be of uniform depth and the risers shall be of uniform height. The slope of ramps shall not exceed that required in Code §27-377.
6.2.13 Substantial handrails shall be provided on both sides of all stairways of four or more risers connecting adjoining levels whose difference in elevation is 80 inches or more.
6.2.14 Substantial handrails shall be provided on both sides of landings, platforms or ramps 30 inches or more above grade.
6.2.15 Handrails shall be at least 30 inches above the ramp surface or nose of steps and 42 inches above the landings.
6.2.16 The distance between handrails shall not be less than 18 inches for single lane passage and 36 inches for double lane passage.
6.2.17 Two intermediate rails spaced equally apart or equivalent construction to prevent a passenger from falling through the handrails shall be provided with handrails.
6.2.18 Stairways and ramps requiring handrails in accordance with 6.2.13 or 6.2.14 which are more than 8 feet wide shall be provided with railings dividing the widths into not more than 8 feet and not less than the widths of 6.2.11.
6.2.19 Stairways, landings and ramps shall be designed, constructed and maintained so as to sustain safely a live load of at least 100 pounds per square foot.
* 6.2.20 Surfaces in 6.2.19 shall be of non-slip type.
6.2.21 ILLUMINATION. Access to and exits from amusement devices, erected permanently or temporarily, shall be provided with illumination by natural or artificial means of not less than five (5) foot candles measured at grade level.
6.3 EMERGENCY BRAKES AND ANTI-ROLL BACK DEVICES.
*6.3.1 If cars or other components of an amusement device may collide upon failure of normal controls, emergency brakes sufficient to prevent such collisions shall be provided.
*6.3.2 On devices which make use of inclined tracks, automatic anti-roll back devices shall be installed to prevent backward movement of the passenger-carrying units in case of failure of the propelling mechanism when such backward movement could result in injury to a member of the public.
6.4 SIGNAL SYSTEM.
*6.4.1 Signal systems for the starting and stopping of amusement device shall be provided where the operator of the device does not have a clear view of the point at which passengers are loaded or unloaded.
6.4.2 Any code of signals adopted for the operation of any amusement device shall be printed and kept posted at both the operators and signalman stations. All persons who may use these signals shall be carefully instructed in their use.
6.4.3 Signals for movement or operation of an amusement device shall not be given until all passengers and other persons who may be endangered are in a position of safety.
*6.5 PROTECTION AGAINST MOVING PARTS.
*6.5.1 An amusement device shall not be used or operated while any person is so located as to be endangered by it. Areas in which persons may be so endangered shall be fenced, barricaded or otherwise guarded against public intrusion.
6.5.2 Machinery used in or with an amusement device shall be enclosed, barricaded or otherwise effectively guarded against contact. Guards removed for maintenance purposes shall be replaced before normal operation is resumed. Maintenance shall not be conducted while in public use.
*6.6 SPEED LIMITING DEVICES. An amusement device capable of exceeding its maximum safe operating speed shall be provided with a maximum speed-limiting device which may be either electrical or mechanical.
6.7 PASSENGER-CARRYING DEVICES.
6.7.1 The interior and exterior parts of all passenger-carrying amusement devices with which a passenger may come in contact shall be smooth and rounded, free from sharp, rough or splintered edges and corners, with no protruding studs, bolts, screws or other projections which might cause injury.
*6.7.2 Interior parts upon which a passenger may be forcibly thrown by the action of the device shall be adequately padded.
6.7.3 Amusement devices equipped with a safety bar, cage or other mechanically operated restraining device shall be equipped with a retiring cam or other device so designed that the safety bar, cage or other mechanically operated device cannot be released except at the point of loading or unloading; or alternately that the release device is on the exterior of the conveyance, cab or vehicle and is normally actuated by the amusement device operator.
6.7.4 Amusement devices which are self-powered and which are operated by a passenger shall have the driving mechanism so guarded and the guards so secured in place as to prevent passengers from gaining access to the mechanism.
*6.7.5 Belts, bars, footrests and other equipment as may

be necessary for safe entrance and exit and for support while the device is in operation shall be provided and maintained in a safe condition. Such equipment and the fastenings shall be of sufficient strength to retain the passengers.

6.7.6 Passenger restraining or containing devices shall be provided and used on any amusement device where centrifugal and other forces or mechanical malfunction could unseat or dislodge a passenger.

*6.7.7 Passenger restraining or containing devices used on tubs, cars, chairs, seats, gondolas and other carriers on an amusement device, where the forces generated by the action of the device require retention, restraint or actual physical support of the passenger shall be designed, constructed, installed, and maintained to support the passenger safely. The fastenings shall be a type which cannot be inadvertently released by the passenger or by an accidental means. Icebox fastenings on a scrambler will not meet this requirement.

6.7.8 Anchorages for the required restraining devices shall have strength at least equal to the strength of the restraining device.

6.8 PASSENGER TRAMWAYS.

6.8.1 The standards prescribed by safety requirements for Aerial Passenger Tramways ANSI B77.1-1982 and supplements B77.1a-86 and B77.1b-88 are adopted as safety standards and shall apply according to the provisions thereof.

6.8.2 Each operator engaged in passenger tramway operations shall protect the public by complying with the standards prescribed in 6.8.1.

6.8.3 Only technical standards relating to public safety are adopted by any incorporation by reference as prescribed in 6.8.1. Other standards relating to administration and reporting procedures are not adopted.

6.8.4 Where any conflict occurs between the standards prescribed in 6.8.1 and these rules, these rules shall prevail.

6.9 ELECTRICAL EQUIPMENT.

6.9.1 All electrical wiring and equipment used for amusement devices or for lighting shall be installed, operated and maintained in accordance with the New York City Electrical Code.

6.9.2 All electrical transformer substations shall be properly enclosed and proper warning signs shall be posted.

6.9.3 Electrical wiring and equipment located outdoors shall be of such quality and so constructed or protected that exposure to weather will not interfere with its normal operation.

6.9.4 Elevated power lines crossing access or other roads within the grounds of a carnival or amusement park shall be so suspended as to provide a vertical clearance of at least 14 feet from the road surface or 3 feet above any vehicle used within the grounds of a carnival or amusement park. A horizontal clearance of at least three feet shall be provided on each side of the normal passage space of vehicles.

6.9.5 All lamps for general illumination shall be protected from accidental contact or breakage. Protection shall be provided by elevation of at least 7 feet from normal working surface or by a suitable fixture or lampholder with a guard.

6.9.6 Each electrically powered amusement device shall be effectively grounded. The grounding shall be made effective as to all non-current carrying metal parts which may become energized and which are exposed to contact by any person.

6.9.7 PROTECTION OF EMPLOYEES. No employees shall be suffered or permitted to work in such proximity to any part of an electric power circuit that he may contact the same in the course of his work unless he is protected against shock by de-energizing the circuit, grounding it, or guarding it by effective insulation. If the protection is supplied by de-energizing the circuit, the switch controlling the circuit shall be locked out to prevent inadvertent closing.

6.10 AIR COMPRESSORS AND EQUIPMENT. Air compressors, air compressor tanks and equipment used in connection therein shall be designed, constructed, equipped and maintained to insure safe operation at all times. They shall be inspected and tested every six months by a qualified person. Air compressor tanks shall be tested to demonstrate that they will sustain a hydrostatic pressure for a period of at least one (1) hour. Such test shall be conducted at the same time as the required periodic inspection and test. A record of each inspection shall be kept and made available to the Commissioner. Air compressor tanks and other air receivers used in connection with air compressors shall have the maximum allowable working pressure conspicuously marked thereon. Refer to Rule 6.11.

6.11 FIRE PREVENTION. The New York City Fire Prevention Code shall be applicable to this section.

6.11.1 Fabrics constituting part of an amusement device shall be flame resistant to meet the following field test: The application of a flame from a three-quarter inch paraffin candle for a period of one minute which does not cause the fabric to flash, nor support combustion, nor continue to flame for more than two seconds or glow for more than thirty seconds after removal of the test flame.

6.11.2 Approved fire extinguishers shall be provided where necessary to secure reasonable and adequate protection from fire hazards.

6.11.3 Flammable waste such as oily rags and other flammable materials shall be placed in covered metal containers which shall be kept in easily accessible locations. Such containers shall not be kept at or near exit.

6.11.4 Gasoline and other flammable liquids and flammable gases when stored shall be kept in reasonably cool and ventilated places. Such liquids shall be in approved containers. Smoking and the carrying of lighted cigars, cigarettes or pipes is prohibited in any area where such liquids or gases are stored or are transferred from one container to another.

6.12 LOAD TESTS.

6.12.1 No passenger-carrying amusement device of the following types shall be used or put into normal operation until it has withstood an annual load test without failure in any material respect:

6.12.1.1 Devices having suspended passenger seats or spaces;

6.12.1.2 Devices normally operated at speeds or with movements creating severe gravity, inertial or centrifugal forces;

6.12.1.3 Devices so elevated that structural failure is likely to cause passengers to be injured by falling;

6.12.1.4 Devices as to which the commissioner has ordered such a test upon finding it necessary to assure safety.

*6.12.2 Each passenger seat or space shall be weighted with at least 150 pounds dead weight, except that in a device intended only for small children, each seat or space shall be weighted with at least 75 pounds. While so loaded the device shall be operated at maximum normal speed as to test the full operation of all control devices, anti-rollback devices, speed limiting devices, brakes and other equipment provided for safety. The device shall withstand the test without failure in any material respect. The soil and the foundation shall not show signs of inadequacy.

6.12.3 Unless a load test is made in the presence of the Commissioner, the owner of the device shall cause to be filed with the Commissioner a statement by either (1) the manufacturer of the device, or (2) an insurance carrier lawfully doing business in this State and carrying public liability insurance on the device, or (3) a qualified Licensed PE or RA showing whether the device withstood the test without failure in any material respect and setting forth such other relevant information as the Commissioner may require. Until such a statement is so filed it shall be presumed that the device has not withstood the test as required.

6.12.4 A load test complying with 6.12.3 when performed in another jurisdiction shall be deemed acceptable, provided:

6.12.4.1 The statement required by 6.12.3 is substantially equivalent and the information therein is verified by a Licensed PE or RA.

6.12.4.2 The jurisdiction enforces rules substantially equivalent to this Section, and

6.12.4.3 A copy of the statement is furnished to the Commissioner.

6.12.5 If the device fails to withstand a load test it shall be deemed unsafe and shall not be used until and unless it has withstood a subsequent load test without failure in any material respect. If the device has withstood a load test without failure in any material respect, it shall be required to be so tested again before going into normal operation only if rebuilt or modified or if there are reasonable grounds to believe that a further test is necessary before the next required load test to assure safety and the Commissioner orders such test to be made.

6.13 IDENTIFICATION AND RATING PLATES.

*6.13.1 Every amusement device shall be identified by the name and address of the manufacturer, a trade or descriptive name and the physical information prescribed in Section 6.13 and in Part VI.

*6.13.2 A metal plate shall be affixed to the amusement device readily visible and legible at all times and shall contain the following information:

*6.13.2.1 Owner's name and address

*6.13.2.2 Department of Consumer Affairs license number

*6.13.2.3 Name of device

*6.13.2.4 Capacity of device

*6.13.2.5 Speed of device

*6.13.3 Information other than as required in Section 6.13.2 may be kept in an office on the same premises.

*6.13.4 If an amusement device or its supporting structure is altered or its name changed, or its capacity increased, or its speed increased, or its ownership changed, the metal plate shall be removed and a new metal plate with the correct information shall be affixed to the device.

*6.14 ASSEMBLY AND DISASSEMBLY.

*6.14.1 The assembly and disassembly of an amusement device shall be done by or under the immediate supervision of a person experienced and instrumental in the proper performance of such work in respect to the device or structure.

* 6.14.2 Assembly work shall be performed in a proper and workmanlike manner. Parts shall be properly aligned and shall not be bent, distorted, cut or otherwise injured to force a fit. Parts requiring lubrication shall be lubricated in course of assembly and as required during operation. Fastening and locking devices, such as bolts, cap screws, cotter pins and lock washers, shall be installed where required for safe operation. Nuts shall be drawn tight, cotter pins shall be spread and lock nuts firmly set. "R" pins shall only be used in locations recommended by the manufacturer or licensed PE or RA.

* 6.14.3 Parts which are excessively worn or which have been materially damaged shall not be used. Close visual inspection of parts shall be made during assembly to discover such wear or damage and immediate inspection of fastening devices shall be made after assembly to assure that they have been properly installed.

* 6.14.4 Persons engaged in the assembly or disassembly of amusement devices shall be provided with and shall use tools of proper size and design to enable the work to be done in a proper manner. Broken, damaged and unsuitable tools shall not be used.

* 6.14.5 Assembly and disassembly of amusement devices shall be done under light conditions sufficient to permit the work to be properly performed and inspected.

* 6.14.6 A sufficient number of persons to do the work properly shall be engaged for the assembly or disassembly of amusement devices. Persons not so engaged shall be prevented from entering the area in which the work may create a hazard.

*6.14.7 The owner of an amusement device shall comply with the manufacturers construction manual for the assembly and disassembly of the device. The manufacturers construction manual shall be kept with the amusement device and shall be available for use by an authorized representative of the Department.

*6.15 LIGHTING.

*6.15 Amusement devices access thereto and means of egress therefrom shall, while in operation or occupied, be provided with illumination by natural or artificial means sufficient to guard against injuries to the public.

PART III OPERATION

7.0 NOTICE.

7.0.1 No amusement device shall be used at any time or location unless prior notice of intent to use the same has been given to the Commissioner.

*7.0.2 Notice of planned schedules shall (1) be in writing, (2) identify the device, (3) state the intended dates and locations of use, and (4) be given to the Department's Elevator Division and Bureau of Electrical Control at least five days before the first intended date of use.

7.1 DAILY INSPECTION AND TEST.

*7.1.1 In addition to the requirement set forth in Sections 5.0, 5.1 and 5.2 an amusement device shall be inspected and tested on each day before it is intended to be used. The inspection and test shall be made by a qualified person experienced and instructed in the proper assembly and operation of the device and shall be performed before the device is put into normal operation.

7.1.2 The inspection and test shall include the operation of control devices, speed-limiting devices, brakes and other equipment provided for safety.

*7.1.3 In addition to the requirements of 5.2.1. a record of each inspection and test shall be made at once, upon completion of the test, and shall be kept with the amusement device and available to the Commissioner or authorized representative for at least one year.

*7.2 LOCATION OF CONTROLS. Controls for the starting and stopping of amusement devices shall be so located that the operator of the device has a clear view of the point at which passengers are loaded and unloaded.

*7.3 CONTROL OF OPERATION. Amusement devices shall be operated only by designated competent operators who have secured a Certificate of Competence from the Commissioner in accordance with the provisions of Code §27-1005.

*7.3.1 The device operator shall operate no more than one device at any given time.

*7.3.2 The device operator shall have knowledge of the use and function of all normal and emergency operating controls and the proper use of the device.

*7.3.3 The device operator shall be in the immediate vicinity of the operating controls during operation and no other person shall be suffered or permitted to handle such controls during normal operations. This provision shall not apply to amusement devices designed to be operated or controlled safely by a passenger.

*7.3.4 The device operator shall not operate any device when under the influence of alcohol or drugs.

*7.3.5 The device operator shall operate the device in accordance with the manufacturers operating manual. The manufacturers operating manual shall be kept with the amusement device or in an office on the same premises and shall be available for use by an authorized representative of the Department.

*7.3.6 The device operator shall lock-out the electrical disconnect switch when restoration of electrical power to amusement device could create a hazard to persons during the performance of maintenance, repair, inspection or an emergency evacuation of passengers, and insure that it retains lock-out until such time that restoration of power will not create hazard.

*7.4 OVERLOAD AND OVERSPEED.

*7.4.1 An amusement device shall not be overcrowded, or loaded in excess of its safe carrying capacity.

*7.4.2 An amusement device shall not be operated at an unsafe speed or at a speed beyond that recommended by the manufacturer.

*7.5 WIND AND STORM HAZARD. An amusement device which is exposed to wind or storm shall not be operated under dangerous conditions except to release or discharge occupants.

*7.6 UNSAFE. If the Commissioner finds that an amusement device presents an imminent danger, he may attach to said device an UNSAFE notice, warning all persons against the use of the device. Such notice shall not be removed until the device is made safe, and then only by a representative of the Commissioner. The device shall not be used during the time that the notice is attached.

*7.7 CLEANLINESS.

*7.7.1 A suitable number of metal containers shall be provided in and around amusement devices. Excessive accumulations of trash or refuse shall be promptly removed.

*7.7.2 All parts of amusement devices and temporary structures used by passengers or customers shall be maintained in a clean condition.

*7.8 PASSENGER CONDUCT.

*7.8.1 The owner shall have the right to refuse any member of the public admission to a device if his bearing or conduct will endanger himself or other members of the public.

*7.8.2 The owner shall have the right to refuse admittance to any device if the intended passengers health or physical condition makes it unsafe for him to use the device.

*7.8.3 The owner shall refuse a passenger seeking admission to an amusement device if the passenger cannot meet a guardian or height restriction if the device is subject to such a restriction. Legible signs to this effect shall be posted in full view of the public seeking admission to the amusement device. Refer to the requirements of the Department of Consumer Affairs.

*7.9 WARNING SIGNS.

*7.9.1 Where an amusement device exposes a passenger

to high speed, substantial centrifugal force or a high degree of excitement, the owner shall post a conspicuous warning sign at the entrance to the device advising the public of the risk to passengers.

* 7.9.2 The sign required by 7.9.1 shall be at least 2 feet by 2 feet in sharply contrasting colors.

* 7.9.3 The sign required by 7.9.1 shall read as follows or express an equivalent warning.

The following people should not ride this amusement device:

1. Those under the influence of alcohol.
2. Those under influence of narcotics.
3. Those with heart conditions.
4. Pregnant women.
5. Handicapped people.
6. Those subject to motion sickness.
7. Those with back ailments.

* 7.9.4 The following additional signs may be required to be posted:

* 7.9.4.1 Passengers shall remain seated until device comes to complete halt!

* 7.9.4.2 No Standing!

* 7.9.4.3 No Smoking!

* 7.9.4.4 No Food or Drink!

PART IV. BUILDING AND STRUCTURES THAT ARE A FUNCTIONAL PART OF AN AMUSEMENT DEVICE.

8.0 SCOPE. This part shall apply to the construction of buildings and structures that are a functional part of an amusement device. To be a functional part of an amusement device, the building or structure shall be a contributing factor to the amusement, pleasure, thrill or excitement of the device.

8.1 CONSTRUCTION. Building Code Occupancy group classification, assembly, designation F-2, shall apply to buildings and structures constructed according to this part.

8.2 OCCUPANCY SAFETY. The following shall be provided in buildings and structures that are a functional part of an amusement device.

8.2.1 Posted signs indicating the number of persons who may safely occupy the space.

8.2.2 Illuminated exit signs in compliance with Article 6 of Subchapter 6 of the Code.

8.2.3 Not less than two fire extinguishers of a 10 pound ABC multi-purpose type approved by Underwriters Laboratory, Inc.

PART V. ENCLOSED BUILDINGS AND STRUCTURES WHICH IN THEIR ENTIRETY CONSTITUTE THE AMUSEMENT DEVICE.

9.0 SCOPE. This part shall apply to the construction of enclosed buildings and structures which in their entirety constitute the amusement device. It functions by pedestrians passage (by persons and/or children) through the enclosed building or structure which activates devices which contribute to their pleasure, thrill or excitement.

9.1 CONSTRUCTION. Building Code occupancy group classification, assembly, designation F-3, shall apply to buildings and structures constructed according to this part. Fun houses and haunted houses are representative occupancies.

9.2. OCCUPANCY SAFETY. The following shall be provided in buildings and structures occupied in accordance with this part:

*9.2.1 A posted sign at a prominent entrance location of 4 inch high letters stating:

OCCUPANCY BY MORE THAN 75 PERSONS IS UNLAWFUL.

9.2.2 A posted sign at a prominent entrance location stating:

NO SMOKING OR OPEN FLAME.

*9.2.3 Illuminated exit signs in compliance with Article 6 of Subchapter 6 of the Code.

*9.2.4 Automatic Fire Detectors in compliance with reference standards RS 17-3 and RS 17-5E. Closed circuit supervised detectors shall be installed in accordance with the above referenced standards.

9.2.4.1 Closed circuit supervised means all detector loops are complete. Should a break occur in the loop wiring, a trouble signal will sound at the control panel.

*9.2.5 Emergency lighting in compliance with Code §27-542; and activated at the same time as the automatic fire detection system.

9.2.6 Not less than two fire extinguishers of a 10 pound ABC multi-purpose type approved by Underwriters Laboratory, Inc.

PART VI. PHYSICAL INFORMATION TO BE PROVIDED FOR AMUSEMENT DEVICES.

10.0 SCOPE.

*10.0.1 ANSI/ASTM F698-1988. Standard Specification for Physical Information to be provided for Amusement Devices, as modified.

*10.0.2 The specification in section 10.1 covers the minimum requirements for information regarding amusement devices that shall be provided to the end user by the manufacturer or seller of amusement devices.

*10.1 SIGNIFICANCE AND USE.

*10.1.1 The purpose of this specification is to provide the minimum information necessary for the proper identification, placement, erection and operation of each amusement device.

*10.2 INFORMATION REQUIREMENTS.

*10.2.1 The information in sections 3.2 to 3.16 shall be either included or indicated as not applicable for all amusement devices by the manufacturer or seller at the time of sale of such amusement device.

*10.2.2 DEVICE SERIAL NUMBER.

A manufacturers issued unique identifying number or code affixed to the device in a permanent fashion.

*10.2.3 DEVICE MODEL NUMBER. A manufacturers issued unique identifying number or code assigned to each manufactured type of device having the same structural design or components.

*10.2.4 DATE OF MANUFACTURE. The date (month and year) determined by the manufacturer that the given device met his required construction specifications.

*10.2.5 TRAILERING INFORMATION. Each trailer necessary for the transport of a portable amusement device shall be provided with the following information: height, width, length and weight.

10.2.6 STATIC INFORMATION. The following information shall be provided for the amusement device when it is in a non-operational state with no passengers: height, width, diameter and weight.

10.2.7 DEVICE SPEED.

*10.2.7.1 Maximum revolutions per minute, or

*10.2.7.2. Maximum feet per second or miles per hour.

*10.2.8 DIRECTION OF TRAVEL. When the proper direction of travel is essential to the design operation of the device, the manufacturer shall designate the direction of travel, including reference point for this designation.

*10.2.9 POWER REQUIREMENTS.

*10.2.9.1 ELECTRICAL. Total electrical power required to operate the device designated in watts, volts and amperes, including minimum and maximum voltage limits.

*10.2.9.2 MECHANICAL. Minimum horsepower necessary to operate the device properly.

*10.2.10 LOAD DISTRIBUTION PER FOOTING.

*10.2.10.1 Maximum static loading of each footing of an amusement device, and

*10.2.10.2 Maximum dynamic loading of each footing of an amusement device.

*10.2.11 PASSENGER CAPACITY.

*10.2.11.1 Maximum total passenger weight, and

*10.2.11.2 Maximum number of passengers.

*10.2.12 RIDE DURATION. The actual time the ride is in operation or a passenger is exposed to the elements of the device functions, including passenger restrictions to maximum exposure time shall be included.

*10.2.13 RECOMMENDED BALANCE OF PASSENGER LOADING OR UNLOADING.

When passenger distribution is essential to the proper operation of the device, the appropriate loading and unloading procedure, with respect to weight distribution shall be provided.

*10.2.14 RECOMMENDED PASSENGER RESTRICTIONS. Where applicable, any recommended passenger limitations such as, but not limited to, height, weight, age, passenger placement, or any other appropriate restrictions.

*10.2.15 ENVIRONMENTAL RESTRICTIONS. Recommendations for operational restrictions relating to environmental conditions such as, but not limited to, wind, rain, salt corrosion, and extreme heat or cold.

****** 11-91 BCR; 934-84 BCR***

****DOB 3-8-96***

REFERENCE STANDARD RS-19
SAFETY OF PUBLIC AND PROPERTY DURING CONSTRUCTION OPERATIONS

[*] LIST OF REFERENCED NATIONAL STANDARDS

ANSI A10.3 Power Actuated Fastening Systems-Safety Requirements, as Modified.....1985
ANSI A10.11 American national standard for personnel and debris nets used during construction, repair and demolition operations, as modified.....1989
Local Law 61-1987; 111-90 BCR; 234-90 BCR; 1155-80 BCR

[**] REFERENCE STANDARD RS 19-1

ANSI A10.31-985-Power-Actuated Fastening Systems-Safety Requirements, as Modified.

Modifications.-The provisions of ANSI A10.3-1985 shall be subject to the following modifications. The section numbers are from that standard.

Amend section 4.2.2.1 to read as follows:

4.2.2.1 Medium-velocity tools, indirect-acting (piston) type, as defined in section 3, shall (meet the requirements of 4.1) not be accepted.

Delete sections 4.2.2.2, 4.2.2.3 and 4.2.2.4.

Amend section 4.2.3.1 to read as follows:

[†]4.3.2.1. High velocity tools, direct-acting or indirect-acting type, as defined in section 3, shall (meet the requirements of 4.1) not be accepted.

Delete sections 4.2.3.2, 4.2.3.3 and 4.2.3.4.

†As enacted, but "4.2.3.1" probably intended

Add the following new section:

5.6 Selection of load.-No employer shall knowingly furnish to an employee for use in a tool any cartridge or load not suitable for safe use in that tool, whether by reason of excessive power, improper design or poor material. The operator shall use due care to select the proper cartridges or power loads, or other means of controlling the force of the explosion so that is develops no more than the necessary pressure to bring about the desired penetration. In doing so, the operator shall be guided by the manufacturer's specifications.

5.6.1 Proper Load.-When doubt exists (as to proper load), the operator shall make a trial shot to test the surface and the strength of the material to be penetrated. The trial shot shall be made with the lowest power level and then increasing strength until a proper fastening is made. During this test, the operator and all bystanders shall adhere to all safety rules including, but not limited to wearing goggles and hard hats required for the job.

Add the following sentence before the first sentence in section 7.10:

7.10 The operator shall always verify the thickness and type of material into which the stud, pin or fastener is to be driven.

Add the following sections:

9.4 Storage of power loads shall be in accordance with the requirements of Fire Prevention Directive 2-62 R, dated February 21, 1979, Division of Fire Prevention, entitled "Regulations Governing the Use and Storage of Ammunition for the Construction and Alteration of Buildings."

10.3.1 The authorized instructors' card shall list the specific model(s) of powder actuated tool(s) for which training may be given.

10.6 All authorized instructors shall hold a Certificate of Fitness issued by the Fire Department.

11.4.1 The qualified operator's card shall list the specific model(s) of powder actuated tool(s) which may be used.

11.6 All qualified operators shall hold a Certificate of Fitness issued by the Fire Department.

12. Materials and Equipment Acceptance Division.

12.1. Powder-actuated tools using ammunition (power loads) accepted by the Materials and Equipment Acceptance Division and shall be accompanied by such a label.

12.2 Labeling.-The MEA acceptance label may be attached to the tool box or to the operator's manual in lieu of attaching it to the tool but, in any event must be kept available for inspection.

13. Fire Department Requirements.

13.1 The requirements of Fire Department, Division of Fire Prevention, Directive 2-62 R, dated February 21, 1979, entitled "Amended Regulations Governing the Use and Storage of Ammunition for the Construction and Alterations of Buildings" shall be complied with.

13.1.1. The following is extracted from such regulations:

a. Powder actuated tools utilizing ammunition (power loads) shall be used only by a person holding a Certificate of Fitness issued by the Fire Department upon a submission of evidence that person has satisfactorily completed a training program in the safe use of such equipment, acceptable to the Fire Department.

b. No powder actuated tool utilizing ammunition (power loads) shall be used unless the Certificate of Fitness holder establishes a safe zone behind the work area by the use of a one-quarter inch steel back-up plate and/or maintenance of an area clear of all people.

*****111-90 BCR***

*** RS 19-2 POWER OPERATED CRANES AND DERRICKS

1.0 Scope.-This standard applies to the construction, installation, inspection, maintenance and use of power operated cranes and derricks used for hoisting and/or rigging purposes; or used for the construction, alteration, demolition, excavation and maintenance purposes, including highways or sewers; or used for the installation of piles; or used for the hoisting or lowering of any article on the outside of any building or structure.

1.1 Exemptions.-Exempt from the requirements of this reference standard are the following:

1.1.1 Cranes or derricks used in industrial or commercial plants or yards and floating cranes, floating derricks and cranes and derricks used on floating equipment. Also augers, churn-drills and other drilling equipment. Operators of such equipment shall be exempt from any licensing requirements.

1.1.2 Operators of cranes described in section C26-1909.4(a)(3) and (4) of the administrative code shall be exempt from any licensing requirements where the cranes are used in connection with the installation or maintenance of street lighting or public utility overhead power distribution systems.

1.1.3 Derricks having a maximum rated capacity not exceeding one ton.

2.0 Definitions.-

2.1 ACCESSORY.-A secondary part of assembly of parts which contributes to the overall function and usefulness of a machine.

2.2 APPOINTED.-Assigned specific responsibilities by the employer or by the employers representative.

2.3 ANGLE INDICATOR (boom).-An accessory which measures the angle of the boom to the horizontal.

2.4 AUXILIARY HOIST.-(See Whipline).

2.5 AXIS OF ROTATION.-The vertical axis around which the crane superstructure rotates.

2.6 AXLE.-The shaft or spindle with which or about which a wheel rotates. On truck and wheel mounted cranes it refers to an automotive type of axle assembly including housing, gearing, differential, bearings and mounting appurtenances.

2.7 AXLE (bogie).-Two or more automotive type axles mounted in tandem in a frame so as to divide the load between the axles and permit vertical oscillation of the wheels.

2.8 BASE (mounting).The base or carrier on which the rotating superstructure is mounted such as a truck, crawler or platform.

2.9 BOOM.A timber or metal section or strut. The heel (lower end) is affixed to a base, carriage or support, and the upper end supports a cable and sheaves where the load is lifted by means of wire rope and hook.

2.10 BOOM ANGLE. The angle between the longitudinal centerline of the boom and the horizontal. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline, and boom point sheave pin centerline.

2.11 BOOM HARNESS. The block and sheave arrangement on the boom point to which the topping lift cable is reeved for lowering and raising the boom.

2.12 BOOM HOIST-A hoist drum and rope reeving system used to raise and lower the boom.

2.13 BOOM POINT.-The outward end of the top section of the boom.

2.14 BOOM STOP.-A device used to limit the angle of the boom at the highest position.

2.15 BRAKE.-A device used for retarding or stopping motion by friction or power means.

2.16 CAB.-A housing which covers the rotating superstructure machinery and/or operators station.

2.16. 1 CABLEWAY.-A power operated system for moving loads in a generally horizontal direction in which the loads are conveyed on an overhead cable, track or carriage.

2.16.2 CLIMBER CRANE.-A crane erected upon and supported by a building or other structure which may be raised or lowered to different floors or levels of the building or structure.

2.17 CLUTCH.-A friction, electromagnetic, hydraulic, pneumatic or positive mechanical device for engagement of power.

2.18 COUNTERWEIGHT.-Weight used to supplement the weight of the machine in providing stability for lifting working loads.

2.19 CRANE.-A power operated machine for lifting or lowering a load and moving it horizontally which utilizes wire rope and in which the hoisting mechanism is an integral part of the machine.

2.20 CRAWLER CRANE.-A crane consisting of a rotating superstructure with power plant, operating machinery and boom, mounted on a base, equipped with crawler treads for travel.

2.21 DERRICK.-An apparatus consisting of a mast or equivalent members held at the top by guys or braces, with or without a boom, for use with a hoisting mechanism and operating rope, for lifting or lowering a load and moving it horizontally.

2.21.1 A-FRAME DERRICK.-A derrick in which the boom is hinged from a cross member between the bottom ends of two upright members spread apart at the lower ends and joined at the top; the boom point secured to this junction of the side members, and the side members are braced or guyed from the junction point.

2.21.2 BASKET DERRICK.-A derrick without a boom, similar to a gin pole with its base supported by ropes attached to corner posts or other parts of the structure. The base is at a lower elevation than its supports. The location of the base of a basket derrick can be changed by varying the length of the rope supports. The top of the pole is secured with multiple reeved guys to position the top of the pole to the desired location by varying the length of the upper guy lines.

The load is raised and lowered by ropes through a sheave or block secured to the top of the pole.

2.21.3 BREAST DERRICK-A derrick without a boom. The mast consists of two side members spread farther apart at the base than at the top and tied together at top and bottom by rigid members. The mast is prevented from tipping forward by guys connected to its top. The load is raised and lowered by ropes through a sheave or block secured to the top crosspiece.

2.21.4 CHICAGO BOOM DERRICK.-A boom which is attached to a structure, an outside upright member of the structure serving as the mast, and the boom being stepped in a fixed socket clamped to the upright. The derrick is complete with load, boom and boom point swing line falls.

.**21.5 GIN POLE 2 DERRICK**-A derrick without a boom. Its guys are so arranged from its top to permit leaning the mast in any direction. The load is raised and lowered by ropes reeved through sheaves or blocks at the top of the mast.

2.21.6 GUY DERRICK.-A fixed derrick consisting of a mast capable of being rotated, supported in a vertical position by guys, and a boom whose bottom end is hinged or pivoted to move in a vertical plane with a reeved rope between the head of the mast and the boom point for raising and lowering the boom, and a reeved rope from the boom point for raising and lowering the load.

2.21.7 SHEARLEG DERRICK-A derrick without a boom. The mast, wide at the bottom and narrow at the top, is hinged at the bottom and has its top secured by a multiple reeved guy to permit handling loads at various radii by means of load tackle suspended from the mast top.

2.21.8 STIFFLEG DERRICK-A derrick similar to a guy derrick except that the mast is supported or held in place by two or more stiff members, called stifflegs, which are capable of resisting either tensile or compressive forces. Sills are generally provided to connect the lower ends of the stifflegs to the foot of the mast.

2.22 DRUM.-The cylindrical members around which ropes are wound for raising and lowering the load or boom.

2.23 DYNAMIC (loading).-Loads introduced into the machine or its components by forces in motion.

2.23.1 ENGINEER.-The word engineer as used in these regulations shall mean a licensed professional engineer except that the certifications for matters relating to crane design may be made by an engineer licensed by any state or foreign jurisdiction or upon proof, to the satisfaction of the commissioner, of his professional competence.

2.23.2 FOLDING BOOM.-A boom constructed of hinged sections which is articulated in a folding manner and may be folded for storage or transit.

2.24 GANTRY(A-Frame)-A structural frame, extending above the superstructure of a mobile crane, to which the boom supports ropes are reeved.

2.25 GUDGEON PIN.-A pin connecting the mast cap to the mast, allowing rotation of the mast.

2.26 GUY.-A rope used to steady or secure the mast or other members in the desired position.

2.26.1. HOISTING MACHINE-A power operated machine used for lifting or lowering a load, utilizing a drum and wire rope, excluding elevators. This shall include but not be limited to a crane, derrick, and cableway.

2.26.2 HYDRAULIC BOOM.-A boom which is operated by means of a hydraulic system.

2.27 JIB.-An extension attached to the boom point to provide added boom length for lifting specified loads. This jib may be in line with the boom or offset to various angles.

2.27.1 LAY.-That distance measured along a cable in which one strand makes a complete revolution around the cable axis.

2.28 LOAD (working).-The external load, in pounds, applied to the crane or derrick, including the weight of auxiliary load attaching equipment such as load blocks, shackles, and slings.

2.29 LOAD BLOCK (upper).-The assembly of hook or shackle, swivel, sheaves, pins, and frame suspended from the boom point.

2.30 LOAD BLOCK (lower).-The assembly of hook or shackle, swivel, sheaves, pins and frame suspended by the hoisting ropes.

2.31 LOAD HOIST.-A hoist drum and rope reeving system used for hoisting and lowering loads.

2.32 LOAD RATINGS.-Maximum loads that may be lifted by a crane or derrick at various angles and positions as approved by the department.

2.33 MAST.-The upright member of a derrick.

2.33.1 MOBILE CRANE.-A crawler crane; a truck crane; or a wheel mounted crane.

2.34 OUTRIGGERS.-Extendable or fixed metal arms, attached to the mounting base, which rests on supports at the outer ends.

2.35 REEVING.-A rope system in which the rope travels around drums and sheaves.

2.36 ROPE.-Refers to wire rope unless otherwise specified.

2.37 SIDE LOADING.-A load applied at an angle to the vertical plane of the boom.

2.38 SILL.-A member connecting the foot block and stiffleg or a member connecting the lower ends of a double member mast.

2.39 STANDING (GUY) ROPE.-A supporting rope which maintains a constant distance between the points of attachment to the two components connected by the rope.

2.40 STRUCTURAL COMPETENCE.-The ability of the machine and its component to withstand the

stresses imposed by applied loads.

2.41 SUPERSTRUCTURE. The rotating upper frame structure of the machine and the operating machinery mounted thereon.

2.42 SWING. Rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.

2.43 SWING MECHANISM. The machinery involved in providing rotation of the superstructure.

2.44 TACKLE. An assembly of ropes and sheaves arranged for hoisting and pulling.

2.44.1 TELESCOPIC BOOM.A boom constructed of sections of diminishing cross sections in which the sections fit within each other. The boom may be extended in a manner similar to a telescope.

2.44.2 TOWER CRANE.-A crane in which a boom, swinging jib or other structural member is mounted upon a vertical mast or tower.

2.45 TRANSIT.-The moving or transporting of a crane from one job site to another.

2.46 TRAVEL.-The function of the machine moving from one location to another, on a job site.

2.47 TRAVEL MECHANISM.-The machinery involved in providing travel power.

2.48 TRUCK CRANE.-A crane consisting of a rotating superstructure with power plant, operating machinery and boom, mounted on an automotive truck equipped with a power plant for travel.

2.48.1 TRUCK MOUNTED TOWER CRANE.-A tower crane which is mounted on a truck or similar carrier for travel or transit.

2.49 WHEEL BASE.-Distance between centers of front and rear axles. For a multiple axle assembly the axle center wheel base measurement is taken as the midpoint of the assembly.

2.50 WHEEL MOUNTED CRANE (wagon crane).-A crane consisting of a rotating superstructure with power plant, operating machinery and boom, mounted on a base or platform equipped with axles and rubber tired wheels for travel. The base is usually propelled by the engine in the superstructure, but it may be equipped with a separate engine controlled from the superstructure. Its function is to hoist and swing loads at various radii.

2.51 WHIPLINE (auxiliary hoist).-A separate hoist rope system of lighter load capacity and higher speed than provided by the main hoist.

2.52 WINCH HEAD.-A power driven spool for handling of loads by means of friction between fiber or wire rope and spool.

3.0 Filing Applications-for Approval and Operation of Cranes and Derricks.-

* 3.1.1 The following information shall be submitted by an engineer:

1. Design calculations for:

(a) Boom or mast

(b) Jib or extensions

(c) Gantries

(d) Counterweight supports and attachments

(e) Rope

(f) Overturning stability

Only items (a), (b) and (e) of this subparagraph shall apply to derricks.

2. Load test reports where required under this reference standard.

3. A material specification statement certifying the type of steel used in the construction of items (a) through (e) of subparagraph one above.

4. A list of standards used in design and testing.

5. The requirements of subparagraphs one through four above shall be waived for cranes where such information is not available, provided that the equipment satisfies the load test requirements of section 7.0 of this reference standard, which shall apply to the following categories:

(a) Cranes which had a certificate of inspection on or after January 1, 1965.

(b) Cranes manufactured on or April 1, 1962 and prior to April 1, 1970 provided that:

(1) The application is filed with the department of buildings and a certificate of approval is obtained within two years after the enactment of this local law, and

(2) Title to the crane has been in name of the applicant since December 31, 1971.

6. Where cranes manufactured after April 1, 1970 have been tested pursuant to subdivision 6.1 of this reference standard, the requirements of paragraph 3.1.1 above shall be waived, provided that:

(a) The tests are monitored and certified by a competent individual or group, other than the manufacturer, acceptable to the commissioner, or

(b) At the discretion of the commissioner, the tests are monitored and certified by the department, or

(c) In lieu of the monitoring and certification of the tests as provided in items (a) and (b) above, the commissioner shall require design calculations for those items in paragraph 3.1.1 as he shall deem necessary to supplement the tests and reference standard RS 10-5 need not apply.

Local Law 50-1973

* **4.0 Design of Boom and Other Structural Members.-**The boom shall be designed as a beam column, subject simultaneously to axial force, torsion and bending. Stresses induced in the boom by its movement and due to wind during normal operation shall be considered. Stresses of the boom or other structural members enumerated in 1 of 3.1.1 shall not exceed those permitted by reference standard RS 10-5 for mobile cranes with hydraulic booms, for derricks and for tower and climber cranes.

Local Law 50-1973

* **5.0 Use of Special Steels.-**All steel used in the construction of a crane or derrick not specifically accepted for use by the New York City Building Code or an appropriate reference standard thereof, must be approved by the commissioner.
Local Law 50-1973

* **6.0 Load Tests for New Mobile Cranes.-**
6.1 A prototype of each mobile crane, except those with hydraulic booms, manufactured after April 1, 1970 shall be tested for strength and stability in accordance with ANSI B30.5-1968 of the American National Standard Safety Code for Crawler Locomotive and Truck Cranes and in compliance with SAE J987 and SAE J765.
6.2 For mobile cranes with hydraulic booms, a prototype shall be tested in accordance with SAE J765.
6.3 Prior approval of the testing program shall be obtained from the department before performing any load tests after the effective date of this section. The department shall be notified in writing, at least one week in advance, of the date and location of such testing.

7.0 Load Tests for Other Mobile Cranes.-
* 7.1 Mobile cranes which comply with the provisions of 5 of 3.1.1 for which the information specified in 1 and 3 of 3.1.1. is not available, shall undergo a load test as follows:
1. Maximum load used shall not exceed 20,000 pounds.
2. The crane shall be tested at no more than two different radii determined by the commissioner to determine its compliance with manufacturer's load rated chart as required pursuant to these regulations. Upon satisfaction of this test requirement, the crane may be operated to the capacities represented on the chart.
Local Law 50-1973
** 3. A crane tested prior to July 1, 1972 shall be deemed to comply with the requirements of subdivision 13.1 of this standard, provided that the load ratings established by such tests are no greater than eighty (80%) percent of the test loads and in no case greater than those indicated on the manufacturer's load rating chart.
****731-71 BCR; 454-71 BCR***

8.0 Certificate of On-Site Inspection.-
8.1 Use of cranes and derricks at job sites. -
8.1.1 In order to operate a crane or derrick at a job site, a certificate of on-site inspection is required as stipulated in C26-1909.4(d). The owner of the premises, building or structure, or his designated representative, shall file an application in quadruplicate at the department office in the borough where the premises is located. Such application shall be accompanied by plans showing proposed locations of the crane or derrick, pertinent features of the site such as assumed soil bearing values, ground elevations and slopes, vaults or other subsurface structures, supporting platforms or structures, and the swing of the crane or derrick. Also, a document shall be submitted, signed by a licensed engineer or registered architect which shall include the following information where the crane or derrick is to be supported by soil:
(a) That he has inspected the soil at the proposed location or locations of the crane or derrick;
(b) His estimate of the soil bearing value;
(c) That he has explored the existence of any sheeting or retaining walls supporting soil adjoining any excavation which may be affected and certifies as to its adequacy;
(d) If the crane or derrick is to be on the street, that he has explored the existence of vaults or other subsurface structures which could impair the bearing value of the street or sidewalk;
(e) That the load imposed upon the soil by the crane or derrick including supporting platform, does not exceed such bearing value under any condition of loading.
8.1.2 Where a crane not exceeding 160 feet in height, including jibs and any other extensions to the boom is to be used for a period not exceeding 24 hours, or a crane not exceeding 50 feet in height, including jibs and any other extensions to the boom with a maximum rated capacity of 20 tons, is to be positioned on the roadway or sidewalk, a certificate of on-site inspection shall be required. However, the requirements relating to plans and a document of a licensed professional engineer or registered architect enumerated in 8.1.1 of this reference standard shall not apply nor shall the three regular working day provisions of section C26-1909.4(d) be applicable under the following conditions:
(1) That a prototype approval has been obtained showing the means required to distribute the weight of the crane and the maximum working loads.
(2) A statement from the owner of the structure, building or premises or his authorized agent that he visited the site and that there are no excavations or retaining walls and that no vaults or subsurface construction exists at the site.
8.1.3 A certificate of on-site inspection shall not be required under the following conditions:
* 8.1.3.1 For a crane not exceeding 160 feet in height including jibs and any other extensions to the boom, which is to be used for a period not exceeding 48 hours and operating entirely within the property lines and in such locations which are at least a boom length, including jibs and any extensions thereof, distant from all lot lines**.** ***Local Law 50-1973***
8.1.3.2 For service cranes and clamshells operated entirely within the property lines and within such locations which do not involve the moving of any loads over the roadway or sidewalk. This exemption shall apply only to cranes with a boom length, including jibs

and any extension thereof, not exceeding 110 feet.

* 8.1.3.3 For the use of cranes as provided for in 8.1.3.1 and 8.1.3.2, notice of the operation of the crane at the job site shall be given to the division of cranes and derricks, department of buildings, by telephone and confirmed in writing. It shall be the responsibility of an appointed person to provide firm and uniform footing and, when necessary, provide substantial timbers, cribbing or other structural members sufficient to distribute the load so as not to exceed the safe bearing capacity of the underlying material.

Local Law 50-1973

8.2 Cranes or Derricks Supported by a Building or Structure.-

8.2.1 Where the crane or derrick is supported by a building or a structure, the statement by the licensed engineer or registered architect referred to in 8.1.1 shall include the means of supporting and bracing the equipment. The swing of the crane or derrick shall be shown on the plans to insure clearance during operation. Computations shall be submitted with the application showing all reactions imposed on the structure by the crane or derrick, including those due to impact and wind. Such computations shall verify that the stability of the building or structure will not be impaired when the crane or derrick is in operation and that no structural members will be overstressed due to forces induced by the crane or derrick.

8.2.2 Concrete Structures.-If the structure is a concrete structure, test reports of the compression strength of the concrete shall be submitted to insure that the concrete supports of the crane or derrick have developed sufficient strength to support the crane or derrick before it is installed.

The means for establishing concrete strength before imposing crane or derrick loads upon the structure shall be indicated on the application.

8.2.3 All anchorages for cranes and derricks shall be approved by an appointed person.

8.3 Use of Pile Drivers and Clamshells.-

8.3.1 A certificate of on-site inspection shall not be required for pile drivers or clamshells operating entirely within the lot lines under the following conditions:

8.3.1.1 Where pile driving equipment is designed or supported on a platform so that the soil bearing pressure does not exceed 500 pounds per square foot, a certificate of on-site inspection shall not be required.

8.3.1.2 Where clamshells are operating on construction sites and are at least the depth of excavation height from the edge of the excavation and where the soil bearing pressure does not exceed 500 lbs. per square foot, a certificate of on-site inspection shall not be required.

8.3.1.3 Where the pressure on the soil is in excess of 500 pounds per square foot but does not exceed 2,500 pounds per square foot, a pile driver or clamshell may be operated without a certificate of on-site inspection under the following conditions:

(1) That borings have been filed with the department in the construction application under which the work is being performed, and

(2) An amendment is filed to such application by an engineer or architect certifying that on the basis of the borings, the soil is adequate to support the load to be imposed thereon by the subject equipment.

8.4 The Requirements of 8.1.1, 8.2 and Sections C26-1909.4(d) Shall also Apply to Cableways.-

** 8.5 Notwithstanding the provisions of 8.0 through 8.4 where a crane is operated on the sidewalk or roadway, a permit from the department of highways shall be obtained and the pressure on such surface shall not exceed 3500 pounds per square foot. The pressure shall be distributed on the roadway by means of timber platforms extending not less than twelve (12) inches beyond the base of the outriggers on all sides and sufficiently thick to uniformly distribute the pressure as required above of all the loads including the weight of the crane. The timber mats shall have a minimum thickness of two (2) inches. All cranes equipped with steel tracks shall be supported by timber platforms not less than six inches thick and covering the entire base of the crane.

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9.0 Unsafe Hoisting Machines.-

9.1 When it is found that equipment is dangerous or unsafe a notice or order to stop work may be issued by the commissioner, or his authorized representative. Such notice or order may be given to the owner or lessee of the equipment involved, or to the agent of any of them, or to the person or persons executing the work or operating the equipment in writing. If the operation of the hoisting machine is not discontinued, the inspector shall report same to his superior and an engineer shall be sent to reinspect. Upon confirmation of the unsafe condition by the engineer, the hoisting machine shall be red tagged. All persons shall be prohibited from using the said equipment until the danger is removed or the unsafe condition is rectified. An unsafe notice shall not be removed from the equipment, except by an authorized inspector or representative of the department of buildings.

10.0 Annual Renewal of Certificate of Operation.-

Application for renewal of a certificate of operation, as stipulated in C26-1909.4 (c), shall be accompanied by inspection and maintenance records in accordance with 15.1 and 18.1. Upon approval of the application, a new certificate of operation shall be issued after a satisfactory inspection by a department inspector.

11.0 Welded Construction.-

11.1 Welding of structural members of cranes and

derricks enumerated in 1 and 2 of 3.1.1 shall conform to the recommended practices of the American Welding Society as outlined in specifications for welded highway and railway bridges AWS D2.0-66 or other recognized standards or pursuant to RS 19-2.

11.2 For welding of steels not covered by AWS D2.0-66, for all cranes manufactured after April 1, 1970 and all welding performed after that date shall conform to recognized standards.

11.3 The commissioner may require such welds to be tested as he deems necessary.

12.0 Load Ratings and Stability of Cranes and Derricks.-

12.1 Load Ratings-Where Stability Governs Lifting Performance (Mobile Cranes).-

12.1.1 Load ratings for mobile cranes manufactured after April 1, 1970 shall be established by tests performed in accordance with crane load stability test code, SAE J765, April, 1961.

*12.1.2 The margin of stability for determination of load ratings, with booms of stipulated lengths at stipulated working radii for the various types of crane mountings shall be established at 75 percent of the load which will produce a condition of tipping or balance with the boom in the least stable direction relative to the mounting where overturning stability governs the lifting performance. The percentage may be increased to 85 percent for truck cranes which are provided with the safety devices specified in 19.1.1.

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13.0 Load Ratings Where Structural Competence Governs Lifting Performance.-

13.1 Load rating at some radii for mobile cranes and load ratings for climber, tower cranes and derricks are governed by structural competence. Therefore, the limitation on crane loading must be such that no structural member is overstressed, and load rating charts shall be subject to this limitation.

13.2 Load Rating Chart.-

13.2.1 Mobile cranes.-A durable angle and load chart with clearly legible letters and figures shall be provided with each mobile crane and securely fixed to the crane cab in a location easily visible to the operator while seated at his control station. The chart shall contain a full and complete range of crane load ratings, as approved by the department, at all stated operating radii and boom angles, and for all permissible boom lengths, job lengths and angles, also alternate ratings for use and non-use of optional equipment on the mobile crane, such as outriggers and counterweights which affect ratings. The chart shall also contain essential precautionary or warning notes relative to limitations on equipment and operating procedures, including indication of the least stable position. In addition, the chart shall include the following statement:

"Load ratings shown on this chart makes no allowance for such factors as the effect of freely suspended loads, wind, ground conditions, inflation of rubber tires and operating speeds. The operator therefore shall reduce load ratings in order to take these conditions into account."

13.2.2 Each mobile crane, excluding those used with pile driving or dragline equipment, with a maximum rated capacity exceeding one ton shall be provided with a boom angle indicator that shall make the boom angle in degrees clearly visible to the operator at all times. Such crane, except when used with a clamshell, shall be equipped with safety devices as stipulated in 19.1(a), (c), (d) and (e).

13.2.3 Tower and climber cranes.-A substantial, durable and clearly legible rating chart shall be provided with each tower and climber crane and securely affixed in the cab. The chart shall include load ratings approved by the department for specific lengths of components, counterweights, swing, and radii.

14.0 Backward Stability of Mobile Cranes.-The backward stability of a mobile crane is its ability to resist overturning in the backward direction while in the unloaded condition. The degree of resistance to backward overturning is reflected in the margin of backward stability.

14.1 The general conditions applicable to mobile cranes for determination of backward stability margin are as follows:

14.1.1 Crane to be equipped for normal crane operation with shortest recommended boom.

14.1.2 Boom positioned at minimum recommended radius.

14.1.3 Crane to be unloaded.

14.1.4 Outriggers free of the bearing surface unless specified by manufacturer for stationary use.

14.1.4 Crane to be standing on firm supporting surface level within one percent grade.

14.1.6 All fuel tanks at least half full.

14.2 The following are minimum acceptable backward stability conditions for the various types of mobile cranes:

14.2.1 Crawler cranes.-The horizontal distance between the center of gravity of the crane and the axis of rotation shall not exceed 70% of the radial distance from the axis of rotation to the backward tipping fulcrum in the least stable direction.

14.2.2 Truck and wheel mounted cranes.-

(a) With the longitudinal axis of the rotating superstructure of the crane at 90 degrees to the longitudinal axis of the carrier, the total load on all wheels on the side of the carrier under the boom shall not be less than 15 percent of the total weight of the crane.

(b) With the longitudinal axis of the rotating superstructure of the crane in line with the longitudinal axis of the carrier, in either direction, the total load on all wheels under the lighter loaded end of the carrier shall not be

less than 15 percent of the total weight of the crane.

15.0 Inspection Required by Owner for Cranes and Derricks.-

15.1 Certification and inspections required.-The owner of a crane or derrick when applying for a certificate of approval in accordance with 3.0 shall certify that all applicable regulations regarding inspection and maintenance will be complied with. All inspections required by the owner shall be performed only by appointed personnel. The inspections shall be performed to provide information requested in a department supplied chart and all deficiencies shall be corrected. No record of information not required by such chart shall be required to be maintained in writing.

15.2 Inspection classification.-Inspection procedure for cranes and derricks in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the crane or derrick and the degrees of their exposure to wear, deterioration or malfunction. The two general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below:

15.2.1 Frequent inspection.-Daily to monthly intervals.

15.2.2 Periodic inspection.-1 to 12 month intervals or as specifically recommended by the manufacturer.

*__15.3 Frequent inspection.-__Items such as the following shall be inspected for defects at intervals as defined in 15.2.1 or as specifically indicated, including observation during operation for any defects which might appear between regular inspections. Any defects revealed by inspection shall be corrected. Where such defects constitute a safety hazard, the crane or derrick shall not be operated until such defects are corrected.

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15.3.1 All control mechanisms for maladjustment interfering with proper operation.-Daily.

15.3.2 All control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter.

15.3.3 All safety devices for malfunction.

15.3.4 Deterioration or leakage in air or hydraulic systems.-Daily

*15.3.5 Crane or derrick hooks with deformations or cracks.-Refer to 17.3.3(c).

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15.3.6 Rope reeving for non-compliance with crane or derrick manufacturer's recommendations.

15.3.7 Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, moisture accumulation, weatherproofing and grounding.

15.3.8 Tension in derrick guys.-Daily.

15.3.9 Plumb of derrick mast.

15.3.10 Hoist brakes, clutches and operating levers.-Check daily for proper functioning before beginning operations.

*__15.4 Periodic inspections of cranes and derricks__.-Complete inspections of the crane or derrick shall be performed at intervals as generally defined in 15.2.2, depending upon its activity, severity of service, and environment, or as required by 15.5.1 or 15.5.2. These inspections shall include the requirements of 15.0, and in addition, items specifically indicated below. Any defects revealed by inspection shall be corrected. Where such defects constitute a safety hazard the crane or derrick shall not be operated until such defects are corrected.

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15.4.1 Deformed, cracked or corroded members in the crane or derrick structure and boom.

15.4.2 Loose bolts or rivets.

15.4.3 Cracked or worn sheaves and drums.

15.4.4 Worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers and locking devices.

15.4.5 Excessive wear on brake and clutch system parts, linings, pawls and ratchets.

15.4.6 Load, boom angle and other indicators over their full range, for any significant inaccuracies.

15.4.7 Gasoline, diesel, electric or other power plants for improper performance or non-compliance with safety requirements.

15.4.8 Excessive wear of chain drive sprockets and excessive chain stretch.

15.4.9 Crane or derrick hooks.-Magnetic particle or other suitable crack detecting inspection should be performed at least once each year by an inspection agency retained by the owner and approved by the department. Certified inspection reports are to be made available to the department upon request.

15.4.10 Travel steering, braking and locking devices, for malfunction.

15.4.11 Excessively worn or damaged tires.

15.4.12 Derrick gudgeon pin for cracks, wear and distortion each time the derrick is to be erected.

15.4.13 Foundation or supports shall be inspected for continued ability to sustain the imposed loads.

15.5 Cranes or derricks not in regular use.-

15.5.1 A crane or derrick which has been idle for a period of one month or more, but less than six months, shall be given an inspection by the owner conforming with requirements of 15.3 and 18.1.3 before an application for a certificate of on-site inspection in accordance with C26-1909.4(d) is submitted to the department.

15.5.2 A crane which has been idle for a period of over six months shall be given a complete inspection by the owner conforming with requirements of 15.3, 15.4 and 18.13 before an application for a certificate of on-site inspection in accordance with C26-1909.4(d) is submitted to the department.

16.0 Testing Required for Cranes and Derricks, Manufactured After April 1, 1970, by Manufacturer or Owner.-

16.1 Operational test.-

16.1.1 In addition to prototype tests and quality control measures, each new production crane and derrick shall be tested by the manufacturer to the extent necessary to insure compliance with the operational requirements of this section, including functions such as the following:

(a) Load hoisting and lowering mechanisms.
(b) Boom hoisting and lowering mechanisms.
(c) Swinging mechanism.
(d) Traveling mechanism.
(e) Safety devices.

16.1.2 Where the complete production crane or derrick is not supplied by one manufacturer such tests shall be conducted at final assembly.

6.1.3 Operational test and production test results certified by the manufacturer or a licensed professional engineer shall be made available to the department with each application for a certificate of approval for a crane or derrick, in accordance with 3.0.

16.1.4 For all cranes and derricks, where electrically powered, the trip setting of hoist limit switches shall be determined by tests with an empty hook traveling in increasing speeds to the maximum speed. The activating mechanism of the limit switch shall be located so that it will trip the switch under all conditions in sufficient time to prevent contact of the hook or load block with any part of the derrick or crane.

17.0 Maintenance of Cranes and Derricks.-

17.1 Preventive maintenance.-

17.1.1 A preventive maintenance program based on the crane or derrick manufacturer's recommendations shall be established. Dated and detailed records shall be readily available to the department.

17.1.2 It is recommended that replacement parts be obtained from the original equipment manufacturer.

17.2 Maintenance procedure.-

17.2.1 Before adjustments and repairs are started on a crane or derrick, the following precautions shall be taken as applicable:

(a) Crane or derrick placed or arranged where it will cause the least interference with other equipment or operations in the area.
(b) All controls at the "off" positions.
(c) Starting means rendered inoperative.
(d) Warning or "out of order" signs placed on the crane or derrick and hoist.
(e) Power plant stopped or disconnected at take-off.
(f) Boom lowered to the ground if possible or otherwise secured against dropping.
(g) Lower load block lowered to the ground or otherwise secured against dropping.

17.2.2 After adjustment and repairs have been made, the crane or derrick shall not be operated until all guards have been reinstalled, safety devices reactivated and maintenance equipment removed.

17.3 Adjustments and Repairs.-

*17.3.1 Any unsafe conditions disclosed by the inspection requirements of 15.0 shall be corrected before operation of the crane or derrick is resumed. Adjustments and repairs shall be done only by competent personnel.

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17.3.2 Adjustments shall be maintained to assure correct functioning of components. The following are examples:

(a) All functional operating mechanisms.
(b) Safety devices.
(c) Control systems.
(d) Power plants.
(e) Tie downs or anchorages.
(f) Signal system.
(g) Guys.

17.33 Repairs or replacements shall be provided promptly as needed for safe operation. The following are examples:

(a) All critical parts of functional operating mechanisms which are cracked, broken, corroded, bent or excessively worn.
(b) All critical parts of the crane or derrick structure which are cracked, bent, broken or excessively corroded.
* (c) Crane or derrick hooks showing defects described in 15.3.5 shall be discarded. Repairs by welding or reshaping are not acceptable unless written approval of the department is obtained.

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(d) Pitted or burned electrical contacts should be corrected only by replacement and in sets. Controller parts should be lubricated as recommended by the manufacturer.

17.3.4 All replacement parts or repairs shall have at least the original safety factor and be in accordance with the specifications of the manufacturer. Approval of the department shall be required for the replacement or repair of main structural members as enumerated in 1 and 2 of 3.1.1 for which no fee will be required.

17.4 Lubrication of Cranes and Derricks.-

17.4.1 All moving parts of the crane or derrick and hoist for which lubrication is specified, including rope and chain, shall be regularly lubricated. Lubricating systems shall be checked for proper delivery of lubricant. Particular care should be taken to follow manufacturer's recommendations as to point and frequency of lubrication, maintenance of lubricant levels and types of lubricants to be used. Lubrication shall be performed under the supervision of the crane operator, oiler or maintenance engineer.

*17.4.2 Machinery shall be stationary while lubricants are being applied and protection provided as called for in 17.2.1(b) through 17.2.1(e) inclusive, unless such

machinery is equipped for automatic lubrication.
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18.0 Rope Inspection, Replacement and Maintenance by Owner for Cranes and Derricks.-

18.1 Inspection.-

*18.1.1 All ropes in continuous service should be visually inspected once every working day. A thorough inspection of all ropes in use shall be made at least once a month. All inspections shall be performed by an appointed person. Any deterioration resulting in measurable loss of original strength, such as described below shall be carefully noted and determination made as to whether further use of the rope would constitute a safety hazard:

(a) Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion or wear of outside wires.

(b) A number of broken outside wires and the degree of distribution of concentration of such broken wires.

(c) Worn outside wires, "birdcaging," or kinks.

(d) Corroded or broken wires at end connections.

(e) Corroded, cracked, bent, worn or improperly applied end connections.

(f) Severe kinking, crushing, cutting or unstranding.

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18.1.2 Heavy wear and/or broken wires may occur in sections in contact with equalizer sheaves, or other sheaves where rope travel is limited, or with saddles. Particular care shall be taken to inspect ropes at these locations.

18.1.3 All rope which has been idle for a period of a month or more due to shutdown or storage of the crane or derrick on which it is installed shall be given a thorough inspection before it is placed in service. This inspection shall be for all types of deterioration and shall be performed by an appointed person whose approval shall be required for further use of the rope.

18.1.4 Particular care shall be taken in the inspection of non-rotating rope.

18.2 Rope Replacement.-

18.2.1 Safety in regard to rope replacement shall depend upon the use of good judgment by an appointed person in evaluating strength in used rope.

18.2.2 Conditions such as the following should be sufficient reason for replacement:

(a) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay.

(b) Wear of one-third the original diameter of outside individual wires.

(c) Kinking, crushing, bird caging or any other damage resulting in distortion of the rope structure.

(d) Evidence of any heat damage from any cause.

(e) Reductions from nominal diameter of more than 3/64 inch for diameters to and including 3/4 inch, 1/16 inch for diameter 7/8 inch to 1 1/8 inches inclusive, 3/32 inch for diameters 1 1/4 inches to 1 1/2 inches inclusive.

(f) In standing ropes, more than two broken wires in one lay in sections beyond and connections or more than one broken wire at an end connection.

(g) In standing or running ropes noncompliance with section C26-1909.2(b), (c) or (d).

18.2.3 Discarded rope should not be used for slings.

18.3 Rope Maintenance.-

18.3.1 Rope shall be stored to prevent damage or deterioration.

18.3.2 Unreeling or uncoiling of rope shall be done as recommended by the rope manufacturer and with extreme care to avoid kinking or inducing a twist.

18.3.3 Before cutting a rope, seizings shall be placed on each side of the place where the rope is to be cut to prevent unlaying of the strands. On preformed rope, one seizing on each side of the cut is required. On non-preformed ropes of 7/8 inch diameter or smaller, two seizings on each side of the cut are required, and for non-preformed rope of one inch diameter or larger, three seizings on each side of the cut are required.

18.3.4 During installation care shall be observed to avoid dragging of the rope in dirt or around objects which will scrape, nick, crush, or induce sharp bends in it.

18.3.5 Rope should be maintained in a well lubricated condition. It is important that lubricant applied as part of a maintenance program shall be compatible with the original lubricant and to this end the rope manufacturer should be consulted. Those sections of rope which are located over sheaves or otherwise hidden during inspection and maintenance procedures require special attention when lubricating rope. The object of rope lubrication is to reduce internal friction and to prevent corrosion. Periodic field lubrication is particularly important for non-rotating rope.

* **19.0 Safety Devices Required.-**

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* **19.1** All cranes or derricks having a maximum rated capacity exceeding one ton shall be equipped with safety devices as provided herein, except equipment used exclusively for pile driving, clamshell and dragline used for excavation. These safety devices shall be acceptable to the commissioner.

*19.1.1 All mobile cranes, including truck mounted tower cranes, shall be equipped with:

(a) A warning light and an acoustical signal located at the operator's position or cab to indicate overload and shall consist of either of the following devices:

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(1) A load measuring device in combination with a load radius or boom angle measuring device with presettable load and angle or radius limits to activate the warning signals and to be used in conjunction with the approved load radius chart.

(2) A load and radius measuring device pre-

programmed to continuously relate the measured data to the load radius chart as a direct reading of load or percentage of rated load.
(b) Where electrically powered, a deadman control on control levers in the cab or crane operator's station.
(c) An effective audible warning and operating signal on the outside of the cab.
(d) Boom stops and boom hoist safety shutoffs. However, boom stops shall not be required for telescoping booms.
(e) An indicator for leveling the crane.
19.1.2 All tower cranes and climber cranes excluding truck-mounted tower cranes, shall have the following safety devices:
(a) Warning light shall be activated at 100% allowable overturning moment.
(b) Acoustic signal shall sound at 105% allowable overturning moment.
(c) Automatic stop if 110% allowable overturning moment is reached.
(d) Automatic stop if load exceeds maximum rated load in high gear.
(e) Automatic stop if load exceeds maximum rated load in intermediate gear.
(f) Automatic stop if load exceeds maximum rated load in low gear.
(g) Predeceleration before top position of the hook.
(h) Limit switch for top position of the hook.
(i) Predeceleration before low position of the hook.
(j) Limit switch for the trolley traveling out.
(k) Limit switch for the trolley traveling in.
(l) Acceleration limitation on the hoist movement.
(m) Acceleration limitation on the swing movement.
(n) Acceleration limitation on the trolley movement.
(o) Deadman control on both joy sticks in box.
*19.1.3 Safety devices for derricks shall be acceptable to the commissioner and shall be installed within six months after said devices are accepted. However, where electrically powered, a deadman control on control levers shall be installed prior to applying for a cerificate pursuant to section C26-1909.4.
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*19.1.4 Any safety device previously approved by the board of standards and appeals shall be acceptable as meeting the requirements of the applicable subparagraphs of 19.1.1.
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20.0 Characteristic and Special Requirements for Mobile Cranes.-
20.1 Hoists, load and swing mechanisms.
20.1.1 Boom hoist.
(a) The boom hoist shall be capable of lifting the boom when the outer end is at the level of the surface on which the crane rest.
(b) The hoisting mechanism shall be provided with a suitable clutching or power engaging device permitting immediate starting or stopping of the boom drum motion. The hoisting mechanism also shall be provided with a self-setting safety brake, capable of supporting all rated loads, with recommended reeving.
(c) Brakes and clutches shall be arranged to be readily adjusted to compensate for wear and to maintain adequate tension in springs where used.
(d) The hoisting mechanism shall be provided with an auxiliary ratchet and pawl or other positive locking device for use as an added safety feature.
* (e) The hoist drum shall have sufficient rope capacity to operate the boom at all positions between the horizontal and the highest angle recommended by the manufacturer and submitted to the department of buildings for the appropiate reeving and rope size, and
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(1) At least two full wraps of rope shall remain on the drum when the boom point is lowered to the level of the crane supporting surface.
(2) The drum end of the rope shall be anchored by a clamp securely attached to the drum or a wedge socket arrangement approved by the crane or rope manufacturer and submitted to the department of buildings.
(f) The drum diameter shall be sufficient to provide a first layer rope pitch diameter of not less than 15 times the nominal diameter of the rope used.
20.1.2 Load hoist.-
(a) The load hoist assemblies shall have power and operational characteristics adequate to perform all load hoisting and lowering functions required in crane service when operated under conditions recommended by the manufacturer and submitted to the department of buildings.
(b) Where brakes and clutches are used to control the motion of the load hoist drums, they shall be of sufficient size and thermal capacity to control all rated crane loads with minimum accepted reeving.
* (c) Load hoist drums shall have sufficient rope capacity size and reeving to perform crane service within the range of boom lengths, operating radii and vertical lifts stipulated by the manufacturer and submitted to the department of buildings.
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* (d) No less than two full wraps of rope shall remain on the drum when the hook is in its extreme low position.
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* (e) The drum end of the rope shall be anchored by a clamp securely attached to the drum or by a wedge socket arrangement approved by the crane or rope manufacturer and submitted to the department of buildings.
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(f) Drums shall be provided with a means to prevent rope from jumping off the drum.
(g) The diameter of the load hoist drum shall be sufficient to provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used.
(h) Positive means, controllable from the operator's

station, shall be provided to hold the drum from rotating in the lowering direction and be capable of holding the rate load indefinitely without further attention from the operator.

* (i) Drum rotation indicators shall be provided and located to afford easy sensing by the operator except when a crane is used exclusively with a clamshell or dragline for excavation purposes or for pile driving.

20.1.3 Load hoist brakes.-

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(a) When power-operated brakes having no continuous mechanical linkage between the actuating and braking means are used for controlling loads, an automatic means shall be provided to prevent the load from falling in event of loss of brake actuating power.

* (b) Foot-operated brake pedals shall be constructed so that the operator's feet will not easily slip off. Means for latching brake in the applied position shall be provided.

(c) Brakes and clutches shall be provided with adjustments where necessary to compensate for wear and to maintain adequate tension in springs where used.

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* 20.1.4 Optional power-controlled lowering.-A power-controlled lowering device may be provided to obtain precision lowering and to reduce demand on the load brake. Such device shall be capable of handling rated loads and speeds as specified by the manufacturer and submitted to the department of buildings.

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20.1.5 Swing control.-

(a) The swing mechanism shall be capable of smooth starts and stops with the varying degrees of acceleration and deceleration required in normal crane operation.

(b) A brake having adequate holding power in both directions shall be provided to prevent movement of the rotating superstructure, when desired under normal operation. The brake shall be capable of being set in the holding position and remaining so without attention on the part of the operator.

(c) A device for positively locking the rotating superstructure shall be provided. It shall be so constructed as to prevent accidental engagement or disengagement.

20.2 Travel controls.-

20.2.1 General.-

(a) On all mobile crane types except truck cranes the controls for the travel function shall be located at the operator's station in the crane cab.

(b) On truck cranes the main travel controls shall be located in the truck cab. Auxiliary travel controls may be provided in the crane cab.

20.2.2 Travel mechanism.-

(a) On crawler cranes, the travel and steering mechanism shall be arranged so that it is not possible for both crawlers to become disconnected simultaneously from the power train and to free wheel.

(b) On truck cranes, the carrier transmission shall have a gear-ratio pattern and adequate control to minimize stalling.

20.2.3 Travel brakes and locks.-

(a) On crawler cranes, brakes or other locking means shall be provided to hold the machinery stationary during working cycles on level grade or while the machine is standing on maximum grade recommended for travel. Such brakes or locks shall be arranged to remain in engagement in event of loss of operating power.

(b) On truck and wheel-mounted cranes, means shall be provided to control completely the crane carrier travel when descending maximum grades specified by the manufacturer under maximum loading conditions. Brakes shall be provided to bring the machine to a stop on level ground within a distance of 32 feet from a speed of 15 miles per hour. Where long or steep grades are to be negotiated, a retarder or similar device should be provided. Means shall be provided to hold the machine stationary on the maximum grade for travel recommended by the manufacturer.

20.3 Operating controls.-

20.3.1 General.-

(a) All controls used during the normal crane operating cycle shall be located within easy reach of the operator while seated at his station.

(b) Arrangement of controls shall be in accordance with applicable requirements of SAE recommended practice crane-shovel basic operating control arrangements, J983 as approved April 1967. Controls for load hoist, boom hoist, and swing clutches shall be provided with means for holding in neutral position, without the use of positive latches.

(c) Shielded panel lights shall be installed over controls.

20.3.2 Control forces and movements.-

(a) When the crane is operated within the ratings and reeving accepted by the department of buildings, controls shall meet the following requirements:

1-Forces required to operate shall not be greater than 35 pounds on hand levers nor greater than 50 pounds on foot pedals.

2-Travel distance on hand levers shall not be greater than 14 inches from the neutral position on two-way levers and not greater than 24 inches on one way levers. Travel distance on foot pedals shall not be greater than 10 inches.

20.3.3 Power plant controls.-Controls for operating the superstructure power plant shall be within easy reach of the operator and shall include:

(a) Means to start and stop.

(b) Means to control speed of internal combustion engines.

(c) Means for shifting selective transmission.

*20.3.4 Engine clutch.-All cranes with a direct mechanical drive to any crane function shall be provided with a clutch for disengaging power. The clutch control shall be within reach from the operator's position.

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20.4 Ropes and reeving accessories.-

20.4.1 Ropes.-

(a) The hoisting rope shall be of a construction submitted to the department of buildings for crane service. Non-rotating rope shall not be used for boom hoist reeving nor for multiple part reeving.

(b) Socketing shall be done in a manner specified by the manufacturer of the assembly and submitted to the department of buildings.

(c) If a load is supported by more than one part of rope, the tension in the ropes shall be equalized.

(d) Whenever exposed to temperatures at which fiber cores would be damaged, ropes having an independent wire-rope or wire-strand core, or other temperature-damage-resistant core shall be used.

*(e) Replacement rope shall be the same size, grade and construction as the original rope furnished by the crane manufacturer and submitted to the department of buildings. Alternate replacement ropes may be used only if specifically recommended by a wire rope manufacturer or the crane manufacturer and submitted to the department of buildings.

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20.4.2 Rope safety factors.-

(a) For supporting rated loads (including boom suspensions):

1-The safety factor for live or running ropes that wind on drums or pass over sheaves shall be not less than 3.5.

2-The safety factor for boom pendants or standing ropes shall not be less than 3.0.

* (b) For supporting the boom and working attachments at recommended travel or transit positions and boom lengths, the safety factor shall be:

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1-For live or running ropes, not less than 3.5.

2-For boom pendants or standing ropes, not less than 3.0.

* (c) For supporting the boom under boom erection conditions, the safety factor shall be:

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1-For live or running ropes, not less than 3.0.

2-For boom pendants or standing ropes, not less than 2.5.

20.4.3 Reeving accessories.-

* (a) Eye splices shall be made in an approved manner and rope thimbles shall be used in the eye.

* (b) U-bolt clips shall have the U-bolt section on the dead or short-end, and the saddle on the live or long end of the rope. Spacing and number of all types of clips shall be in accordance with the clip manufacturer's recommendation and submitted to the department of buildings. Clips shall be drop-forged in all sizes manufactured commercially. When a newly installed rope has been in operation for one hour, all nuts on the clip bolts shall be retightened, and they shall be checked for tightness at frequent intervals thereafter.

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* (c) Swaged, compressed or wedge-socket fittings shall be applied as recommended by the rope or crane manufacturer or fitting manufacturer and submitted to the department of buildings.

20.4.4 Sheaves.-

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(a) Sheave grooves shall be smooth and free from surface defects which could cause rope damage. The cross sectional radius at the bottom of the groove shall be such as to form a close-fitting saddle for the size of rope used and the sides of the groove shall be tapered outwardly to facilitate entrance of the rope into the groove. Flange corners shall be rounded and the rims shall run true about the axis of rotation.

(b) Sheaves carrying ropes which may be momentarily unloaded shall be provided with close-fitting guards or other suitable devices to guide the rope back into the groove when the load is reapplied.

(c) The sheaves in the lower load block shall be equipped with close-fitting guards that will prevent ropes from becoming fouled when the block is lying on the ground with ropes loose.

(d) Means shall be provided to prevent chafing of the ropes.

(e) All sheave bearings shall be provided with means for lubrication unless permanently lubricated bearings are provided.

20.4.5 Sheave sizes.-

(a) Boom hoisting sheaves shall have pitch diameters of not less than 15 times the nominal diameter of the rope used.

(b) Load hoisting sheaves shall have pitch diameters not less than 18 times the nominal diameter of the rope used.

(c) Load block sheaves shall have pitch diameters not less than 16 times the nominal diameter of the rope used.

20.5 Crane cabs.-

20.5.1 Crane cab construction.-

(a) Insofar as practical, all cabs shall be constructed to enclose the superstructure machinery, brakes and the operator's station to provide protection from the weather.

* (b) All windows shall be of, safety glass or equivalent. Windows shall be provided in the front and on both sides of the cab or operators compartment for visibility forward and to either side. Visibility forward shall include a vertical range adequate to cover the boom point at all times. The front window may have a section which can be readily removed or held open if desired. If the section is of the type held in the open position, it shall be well secured to prevent accidental closing.

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(c) All cab doors whether of sliding or swinging type shall be adequately restrained from accidental opening or closing while traveling or operating the machine. The door adjacent to the operator, if of the swinging type, shall open outward and, if of the sliding type, shall slide rearward to open.

(d) A clear passageway shall be provided from the operator's station to an exit door on the operator's side.
(e) Principal walking surfaces in cabs shall be of anti-skid type.
(f) Outside platforms, if furnished, shall be provided with guard rails. Where platforms are too narrow to use guard rails, handholds shall be provided at convenient points above the platform.
20.5.2 Access to cab.-On all crawler, truck and wheel mounted cranes, suitable handholds and steps shall be provided to facilitate entrance to and exit from the operator's cab and the truck cab.
20.5.3 Access to cab roof.-Where access to the cab roof is necessary for rigging or service requirements, a ladder or steps shall be provided to give access thereto and the cab roof shall be capable of supporting, without permanent distortion, the weight of a 200 pound man.

21.0 Characteristics and Special Requirements for Derricks.-

21.1 Load ratings.-

* 21.1.1 Rated load marking.-

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(a) For derricks, a substantial, durable and clearly legible load rating chart shall be provided for each particular installation. The rating chart shall be securely affixed where it is visible to personnel responsible for the operation of, the equipment. The chart shall include but not be limited to the following data:

1-manufacturer's load ratings as approved by the department at corresponding ranges of boom angle or operating radii.

2-specific lengths of components on which the load ratings are based.

3-required parts for hoist reeving.

4-size and construction of all ropes shall be shown either on the rating chart or in the operating manual.

(b) For all other derricks, the manufacturer shall provide sufficient information from which capacity charts can be prepared and approved by the department for the particular installation. The capacity charts shall be located either at the derrick or the job site office.

21.2 Construction.-

21.2.1 General.-Derricks shall be constructed to adequately meet all stresses imposed on all members and components.
21.2.2 Guy derricks.-
(a) The minimum number of guys is six. Preferably, the guys should be equally spaced around the mast.
(b) The manufacturer shall furnish complete information recommending:

1- the number of guys.

2- the spacing around the mast;

3- the maximum vertical slope and initial tension or sag of all guys;

4- the size and construction of rope to be used in each.

(c) The mast base shall permit free rotation of the mast with allowance for slight tilting of the mast caused by guy slack.
(d) The mast cap shall:

1 - permit free rotation of the mast;

2 - adequately withstand tilting and cramping action imposed by the guy loads;

3 - be secured to the mast to prevent disengagement during erection;

4 - be provided with means for attachment of guy ropes.

21.2.3 Stiff leg derrick. -
(a) The mast shall be supported in the vertical position by two stiff legs one end of each being connected to the top of the mast and the other end securely anchored. The stiff legs shall be capable of withstanding the loads imposed by the boom at any point within its range of swing.
(b) The mast base shall:

1 - permit free rotation of mast;

2 - permit slight inclination of the mast without binding;

3 - provide means to prevent the mast from lifting out of its socket when the mast is in tension.

(c) The stiff leg connecting member at the top of the mast shall:

1 - permit free rotation of the mast;

2 - adequately withstand the loads imposed by the action of the stiff legs;

3 - be so secured as to oppose lift off forces at all times.

21.3 Ropes and reeving accessories.-

21.3.1 Guy ropes.-
(a) Guy ropes shall be of suitable size, grade and construction to withstand the maximum load imposed.
(b) The nominal breaking strength of each rope shall be no less than three times the load applied to the rope.
(c) Tie downs or kicker devices which may be easily loosened shall have locknuts or other suitable provision to prevent loosening.
21.3.2 Boom hoist ropes.-
(a) Boom hoist ropes shall be of suitable size, grade and construction to withstand the maximum load imposed.
(b) The live rope reeving system in a boom suspension shall withstand the maximum load imposed and be of sufficient length to permit lowering the boom point to horizontal position with at least three full wraps of rope remaining on the hoist drum.
(c) The nominal breaking strength of the most heavily loaded rope in a system shall be no less than three and a half times the loads applied to that rope.
21.3.3 Main hoist ropes.-
(a) Main hoist ropes shall be of a suitable size and construction to withstand the maximum load imposed.
(b) Ropes in the main hoisting system shall be of sufficient length for the entire range of movement

specified for the application with at least three full wraps of rope on the hoist drum at all times.
(c) The nominal breaking strength of the most heavily loaded rope in a system shall be no less than three and a half times the load applied to that rope.
21.3.4 Reeving accessories.-
(a) Socketing shall be done in the manner specified by the manufacturer of the assembly.
(b) Rope end shall be anchored securely to the drum.
(c) Eyes shall be made in an approved manner and rope thimbles should be used in the eye.
(d) U-bolt clips shall have the U-bolt on the dead or short end, and the saddle on the live or long end of the rope. Spacing and number of all types of clips shall be in accordance with the clip manufacturer's recommendation and submitted to the department. Clips shall be drop-forged steel in all sizes manufactured commercially. When a newly installed rope has been in operation for an hour, all nuts on the clip bolts shall be retightened, and they should be checked for tightness at frequent intervals thereafter.
(e) Swaged, compressed, or wedge-socket fittings shall be applied as recommended by the rope, derrick, or fitting manufacturer.
(f) Where a half wedge socket is used it shall be of a positive locking type.
(g) If a load is supported by more than one rope, the tension in the parts shall be equalized.
21.3.5 Sheaves.-
(a) Sheave grooves shall be smooth and free from surface defects which could cause rope damage. The cross sectional radius at the bottom of the groove should be such as to form a close fitting saddle for the size rope used and the sides of the groove should be tapered outwardly to facilitate entrance of the rope into the groove. Flange corners should be rounded and the rims should run true about the axis of rotation.
(b) Sheaves carrying ropes which can be momentarily unloaded shall be provided with close fitting guards or other suitable devices to guide the rope back into the groove when the load is applied again.
(c) The sheaves in the lower load block shall be equipped with close-fitting guards that will prevent ropes from becoming fouled when the block is lying on the ground with ropes loose.
(d) Means should be provided, if necessary, to prevent chafing of the ropes.
(e) All running sheaves shall be equipped with means for lubrication. Permanently lubricated, sealed and/or shielded bearings shall be acceptable.
(f) Boom and hoisting sheaves shall have pitch diameters not less than eighteen times the nominal diameter of the rope used.
(g) Boom point sheaves should be provided with suitable guides to limit the offlead angle of the rope when entering the grooves from either side.

21.4 Anchoring and guying.-

21.4.1 Guy derricks.-
(a) The mast base shall be securely anchored. Maximum horizontal and downward vertical thrusts encountered when handling rated loads with the particular guy slope and spacing stipulated for the application are among the design factors for which provision must be made.
(b) The guys shall be secured to the ground or other firm anchorage. Maximum horizontal and vertical pulls encountered while handling rated loads with the particular guy slope and spacing stipulated for the application are among the factors for which provision must be made.
21.4.2 Stiff leg derricks.-
(a) The mast base shall be securely anchored. Maximum horizontal and upward and downward vertical thrusts encountered while handling rated loads stipulated for the application with the particular stiff-leg spacing and slope are among the factors for which provision must be made.
(b) The stiff legs shall be securely anchored. Maximum horizontal and vertical upward and downward thrusts encountered while handling rated loads with the particular stiff-leg arrangement stipulated for the application are among the factors for which provision must be made.

21.5 Hoist.-

21.5.1 The hoist shall be suitable for the derrick work intended and shall be securely anchored to prevent displacement from the imposed loads.
* 21.6 Cranes manufactured prior to April 1, 1970 shall be modified to conform to the provisions of 20.1.1(d) and (f), 20.1.2(h) and (i), 20.2.3, 20.3.1(b) and (c), 20.3.2(a)(2), 20.4.5, 20.5.1(b) and derricks manufactured prior to April 1, 1970 shall be modified to conform to the provisions of 21.3.5(f), unless it can be shown to the satisfaction of the commissioner that the crane can not feasibly or economically be altered to comply.
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22.0 Operation Cranes and Derricks. -

22.1 Operators.-

22.1.1 Cranes and derricks shall be operated only by the following persons:
(a) Persons licensed as operators by the department of buildings in accordance with section B26-5.0.
(b) Learners in the presence of and under the direct supervision of a licensed operator.
22.1.2 No person other than those listed under paragraph 22.1.1 above and persons such as oilers and supervisors, whose duties require them to do so, shall enter the cab of a crane and then only in the performance of his duties and with knowledge and consent of the operator.

22.2 Operating practices.-

22.2.1 The operator shall not engage in any practice which will divert his attention while actually engaged in operating the crane or derrick hoist.
22.2.2 The operator shall respond to signals only from the appointed signal men.
22.2.3 The operator shall be responsible for the operation of the crane or derrick hoist.
* 22.2.4 For mobile cranes, the warning signal shall be

sounded each time before on-site traveling and intermittently during such travel, particularly when approaching workmen.

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22.2.5 Before leaving his crane or derrick unattended, the operator shall:

(a) Land any attached load, bucket, lifting magnet, or other device.

(b) Disengage clutches.

(c) Set travel, swing, boom brakes and other locking devices.

(d) Put controls in the "off" position.

(e) Stop the engine.

(f) Secure mobile cranes against accidental travel.

(g) Lock and secure the equipment against unauthorized operation.

22.2.6 On leaving a mobile crane overnight, ground chocks shall be set and crane booms shall be lowered to ground level or otherwise fastened securely against displacement by wind loads or other external forces.

22.2.7 If there is a warning sign on the switch or engine starting controls, the operator shall not close the switch or start engine until the warning sign has been removed by the person placing it there.

22.2.8 Before closing the switch, or starting the engine, the operator shall see to it that all controls are in the "off " position and all personnel are in the clear.

22.2.9 If power fails during operation, the operator shall:

(a) Set all brakes and locking devices.

(b) Move all clutch or other power controls to the "off " position.

(c) Communicate with the appointed individual in charge of operations.

(d) If practical, the suspended load should be landed under brake control.

22.2.10 The operator shall familiarize himself with the equipment and its proper care. If adjustments or repairs are necessary, or any defects are known he shall report the same promptly to his employer or other person responsible for the equipment and shall also notify the next operator of the defects upon changing shifts.

22.2.11 All controls shall be tested by the operator at the start of a new shift. If any controls do not operate properly, they shall be adjusted or repaired before operations are begun.

22.2.12 Booms of mobile cranes which are being assembled or disassembled on the ground with or without support of the boom harness (equalizing sheaves, bridal and boom pendants) should be securely supported by proper blocking to prevent dropping of the boom sections.

23.0 Handling the Load.-No crane or derrick shall be loaded beyond the rated load.

23.1 Size of load.- On all operations involving cranes or derricks which are not equipped with those safety devices which make use of load measuring systems, there shall be a competent appointed individual assigned on a full-time basis to be responsible for determining the magnitude of loads to be lifted or lowered. The operator shall not make a lift unless he has first determined the weight of the load or is informed of such weight by the appointed person responsible for the operation.

23.2 Attaching the load.-

23.2.1 The hoist rope shall not be wrapped around the load.

23.2.2 The load shall be attached to the hook by means of slings or other approved devices.

23.3 Moving the load.-

23.3.1 The appointed individual directing the lift shall see that:

(a) In the case of a mobile crane, the crane is level and where necessary, chocked properly.

(b) The load is well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

23.3.2 Before starting to hoist, he shall take care that:

(a) Hoist ropes are not kinked.

(b) Multiple part lines are not twisted around each other.

(c) The hook is brought over the load in such a manner as to prevent swinging.

(d) If there is a slack rope condition, the rope is properly seated on the drum and in the sheaves.

23.3.3 During hoisting, care should be taken that:

(a) There is no sudden acceleration or deceleration of the moving load.

(b) The load does not contact any obstructions.

23.3.4 Side loading of booms shall be limited to freely suspended loads. Cranes shall not be used for dragging loads sideways. Derricks shall not be used for side loading.

23.3.5 The operator shall not lift, lower, swing or travel while any person is on the load or hook. The operator shall not carry loads over people or over any occupied building.

23.3.6 On truck cranes, loads shall be lifted over the front area only as recommended by the manufacturer and submitted to the department of buildings.

23.3.7 The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.

23.3.8 For mobile cranes, outriggers shall be used when the load to be handled at that particular radius exceeds the rated load without outriggers as given by the manufacturer for that crane and approved by the department of buildings.

23.3.9 Neither the load nor the boom shall be lowered below the point where less than three full wraps of rope remain on their respective drums.

23.3.10 When two or more cranes are used to lift one load, one appointed person shall be responsible for the operation. He shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

23.3.11 In transit, the following additional precautions for mobile cranes shall be exercised:

(a) The boom shall be carried in line with the direction of motion.

(b) The superstructure shall be secured against rotation. When negotiating turns or when the boom is supported on a dolly, the superstructure may be rotated by a licensed crane operator only.

(c) The empty hook shall be lashed or otherwise restrained so that it cannot swing freely.

23.3.12 Before traveling a crane with a load, proposed travel should be shown on a plan of operation and approved by the department. Such data shall be filed with an application for on-site inspection.
23.3.13 A crane shall not be traveled with the boom so high that it may bounce back over the cab.
23.3.14 When rotating the crane or derrick, sudden stops shall not be made. Rotational speed shall be such that the load does not swing out beyond the radii at which it can be controlled. A tag or restraint line shall be used when rotation of the load is hazardous.
23.3.15 When a crane is to be operated at a fixed radius, the boom hoist pawl or other positive locking device shall be engaged.
23.3.16 Use of winch heads:
(a) Ropes shall not be handled on a winch head without knowledge of the operator.
(b) While a winch is being used, the operator shall be within convenient reach of the power unit control lever.

23.4 Holding the load.-
23.4.1 The operator shall not leave his position at the controls while the load is suspended.
23.4.2 People shall not be permitted to stand or pass under a load.
23.4.3 If the load must remain suspended for any considerable length of time, the operator shall hold the drum from rotating in the lowering direction by activating the positive controllable means at the operator's station.
23.4.4 In all cases, when booms are raised or lowered from the horizontal, load blocks including hooks and weight balls shall be left on the ground or deposited to the ground before raising or lowering booms.

23.5 Securing derrick booms.-
23.5.1 Dogs, pawls, or other positive braking mechanism on the hoist shall be engaged. When not in use, the derrick boom shall:
(a) Be laid down;
(b) Be secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block; or
(c) Hoisted to a vertical position and secured to the mast.

24.0 Signals.-
24.1 A signalman shall be provided when the point of operation is not in full and direct view of the operator unless an approved mechanical signaling or control device is provided for safe direction of the operator.
24.2 Only persons who are dependable and fully qualified by experience with the operation shall be used as signalmen.
24.3 A signalman or other appropriate controls shall be provided when operations or equipment on or adjacent to a highway create a traffic hazard.
24.4 Signalmen shall wear high visibility gloves.
24.5 A uniform hand signal system shall be used on all operations of a similar nature. The system in use by the U.S. Corps of Engineers (EM 385-11) may be used as the model.
24.6 Manual hand signals may be used when the distance between the operator and the signalman is not more than 60 feet, but manual hand signals shall not be used when atmospheric conditions prevent clear visibility to the operator.
24.7 Mechanical signal systems shall be protected against unauthorized use, breakage, weather or obstruction which will interfere with safe operation. In the event of any malfunction, all motion shall be stopped immediately.

25.0 Miscellaneous.-
25.1 Ballast or counterweight. - Cranes shall not be operated without the full amount of any ballast or counterweight in place as specified by the maker, and approved by the department.
25.2 Wind speed limitations. - No crane or derrick operator shall start an operation when the wind speed exceeds 30 m.p.h., or when the wind is predicted to reach 30 m.p.h. before the operation can be completed. The U.S. weather bureau data from the nearest reporting station may be used for the determination of wind speed.
25.3 Operating near electric power lines. -
25.3.1 No crane or derrick shall be operated in such a location that any part of the machine or of its load shall at any time come within 15 feet of an energized power line.
25.3.2 Before the commencement of operations near electrical lines, the appointed person responsible for the operation shall notify the owners of the lines or their authorized representatives providing them with all pertinent information and requesting their cooperation.
25.3.3 Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities certify that it is not an energized line.

25.4 Electrical equipment.-
25.4.1 General.-
(a) Wiring and equipment shall comply with the electrical code of the City of New York.
(b) The voltage used on control circuits shall not exceed 750 volts.
25.4.2 Equipment.-
(a) Electric equipment shall be so located or enclosed that live parts will not be exposed to accidental contact.
(b) All motor, controller and switch frames shall be grounded.
(c) Electric equipment shall be thoroughly protected from dirt, grease and oil, and where exposed to the weather, shall be thoroughly protected therefrom.
(d) Guards for live parts shall be substantial and so located that they cannot be deformed so as to make contact with the live parts.
(e) Name plates shall not be removed.
25.4.3 Controllers.-
(a) Each cage operated crane and derrick shall be provided with a device which will disconnect all motors from the line on failure of power and will not permit any motor to be restarted until the controller handle is brought to the "off " position, or a reset switch or button is operated.

(b) Lever operated controllers shall be provided with a notch or latch which in the "off" position prevents the handle from being inadvertently moved to the "on" position.
(c) The controller operating handle shall be located within convenient reach of the operator.
(d) As far as practicable, the movement of each controller handle shall be in the same general directions as the resultant movements of the load.
(e) For floor operated cranes and derricks, the controller or controllers, if rope operated, shall automatically return to the "off" position when released by the operator.
25.4.4 Grounding.-Each crane, which may be operated in the vicinity of a live power line, shall be effectively grounded as hereinafter provided. The crane shall be provided with a permanent clamp or other means for convenient and effective attachment of a grounding conductor. The cable connecting the clamp to the ground shall be equivalent to a No. 2 AWG or larger single conductor, superflexible, rope stranded copper, composed of not less than 1,600 individual wires, with 600 volt covering for mechanical protection and with terminal parts that insure a good connection with hand type screw clamps. An effective ground shall be one having a resistance of 25 ohms or less, which shall be measured, or a connection to a continuous underground metallic water piping system.

25.5 Demolition.-
25.5.1 Crane or derrick operation when used for mechanical demolition shall comply with section C26-1905.4(d) of the building code and, in addition, a crane or derrick operating with a demolition ball shall meet the following requirements:
(a) The weight of the demolition ball shall not exceed fifty percent of the rated capacity of the boom length at its maximum radius.
(b) The swing of the boom shall not exceed thirty degrees from the centerline, front to back of the crane mounting.
(c) The load line and attachment of the demolition ball to the load line shall be checked at least twice daily.
(d) Truck cranes without outriggers extended shall not be used to swing a demolition ball.

26.0 Storage.-
26.1 Necessary clothing and personal belongings shall be stored in or about the crane or derrick in such a manner as to not interfere with access or operation.
26.2 Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in a tool box and shall not be permitted to lie loose in or about the cab or cage.

27.0 Refueling.-
27.1 Refueling shall comply with section C26-1909.1(c).
27.2 Machines shall not be refueled with the engine running.

28.0 Fire Extinguishers.-
28.1 A carbon dioxide, dry chemical or equivalent fire extinguisher shall be kept in the cab or in the vicinity of the crane or derrick.
28.2 Operating and maintenance personnel shall be familiar with the use and care of the fire extinguishers provided.

29.0 Filing for Prototype Equipment.-Where the equipment is a duplicate of equipment previously filed with design information and approved by the department, the previous approval shall be accepted for the design. Evidence shall be submitted that the welding and other manufacturing processes affecting the structural integrity of the crane were performed in accordance with applicable specifications and that required controls were maintained and tests performed**.**

30.0 Waiver of Modification of Rules and Regulations.-The commissioner may, at his discretion, modify or waive any of the foregoing requirements where practical difficulties in complying with particular sections exist and the public safety is not endangered thereby.
******Local Law 73-1969***

*** RS 19-3 CABLEWAYS

1.0 Scope.-This standard applies to the use of cableways for the construction, alteration and repair of buildings.

2.0 Definition.-
2.1 A power operated system for moving loads in a generally horizontal direction in which the loads are conveyed on an overhead cable, track or carriage.

3.0 An on-site inspection shall be required for cableways used for the erection, alteration and repair of buildings. The provisions of article 9.0 of RS 19-2 shall apply and for this purpose the word, "cableway" shall be substituted for "crane" or "derrick" where those words appear in article 9.0**.**
******Local Law 73-1969***

** REFERENCE STANDARD RS 19-4 SAFETY NETS

ANSI A10.11-1989-American national standard for personnel and debris nets used during construction, repair and demolition operations, as modified.

Modifications-The provisions of ANSI A10.11-1989 shall be subject to the following modifications:
(1) Section 3.1 of such national standard shall be deemed to read as follows:
3.1 Safety nets shall be provided in accordance with sections 27-1021 and 27-1022 of the administrative code.
(2) Such national standard shall be deemed to include two new sections 10.8 and 10.9 to read as follows:
10.8 On each elevation of a building, the open sided permanent floor edges shall be guarded by a vertical net lining or its equivalent up to a height of not less than sixty inches.
10.9 When nets are installed vertically, they shall be supported so as to be capable of withstanding a lateral force of two hundred pounds.
****Local Law 61-1987; 234-90 BCR***