

1 RCNY §4000-06

CHAPTER 4000

Electrical Code

§4000-06 Fire alarm wiring and power sources.

(a) Scope. Electrical wiring and power sources serving fire alarm systems shall be installed in accordance with this section. This section shall apply to the alteration of existing buildings, in accordance with Section 101.4.3 of Title 28 of the New York City Administrative Code, and to all new installations.

(b) References. Where Article 760 of the New York City Electrical Code refers to the requirements for the installation of wiring and equipment as set forth by RS 17-3, RS 17-3A, RS 17-3B, and RS 17-3C of the 1968 Building Code, the requirements of this section shall replace Sections 1 and 3 of RS 17-3, Sections 1 and 3 of RS 17-3A, Sections 1 and 3 of RS 17-3B, and Sections 3 and 5 of RS 17-3C. Unless otherwise indicated, any reference in this section to an article of National Fire Protection Association (“NFPA”) 70: National Electrical Code is to the 2008 edition.

(c) Electrical wiring and power sources. Electrical wiring and power sources serving fire alarm systems shall be installed in accordance with Article 760 of NFPA 70: National Electrical Code, as modified for New York City in accordance with this section. The New York City modifications to Article 760 are as follows:

Section 760.1

Section 760.1 - Revise FPN No. 1 by deleting “guard’s tour” in the first sentence.

Revise the last sentence of FPN No. 1 to read as follows:

For further information on the installation and monitoring for integrity requirements for fire alarm systems, refer to NFPA 72: National Fire Alarm Code, 2002 edition.

Add a new FPN No. 3 to read as follows:

FPN No. 3: See Section BC 907 of the New York City Building Code for components’ description and use.

Section 760.2

Section 760.2 - At the end of the definition of “Abandoned Fire Alarm Cable” add: “However, a tag shall be securely fixed to each end indicating location of opposing end.”

Section 760.3

Subsection 760.3(B) - Delete the subsection in its entirety.

Subsection 760.3(F) - Revise to read as follows:

(F) Optical Fiber Cables. Where optical fiber cables are utilized for fire alarm circuits, the cables shall be supervised, and installed in raceway per Article 342, 344 or 358 and in accordance with Article 770 and terminated in equipment listed for fire alarm use.

Subsection 760.3(G) - Revise to read as follows:

(G) Installations of Conductors with Other Systems. Installations shall comply with 300.8 and 760.136.

Section 760.24

Section 760.24 - At the end of the last paragraph add: “Raceways, where installed, shall be minimum 1.9 cm (3/4 in.) trade size. See 760.52 and 760.131 for installations requiring raceways.”

Section 760.25

Section 760.25 - At end of the last sentence add: “and securely fixed to each end indicating location of opposing end.”

Section 760.32

Section 760.32 - Revise to read as follows:

760.32 Fire Alarm Circuits Extending Beyond One Building. Power-limited fire alarm circuits that extend beyond one building and run outdoors shall be installed in raceway in accordance with Articles 342 or 344. Non-power-limited fire alarm circuits that extend beyond one building and run outdoors shall meet the installation requirements of Part 1 of Article 300 and the applicable sections of Part 1 of Article 225 and shall be installed in raceway in accordance with Article 342 or 344.

Section 760.33

Section 760.33 - Add a new section 760.33 to read as follows:

760.33 Fire Alarm Circuit and Equipment Grounding. Fire alarm circuits and equipment shall be grounded in accordance with Article 250 and shall comply with the following requirements:

(A) **Grounding Electrode Conductor.** At the primary and secondary power source supplying the fire alarm system, a grounding electrode conductor shall be sized and installed in accordance with Article 250, Table 250.66 (#10 AWG minimum).

(B) **Equipment Grounding Conductor.** Where there are conduits supplying 120V power to a fire command station, control unit or distributed control cabinets, a separate green insulated equipment ground conductor shall be sized and installed in accordance with Article 250, Table 250.122 (#10 AWG minimum).

(C) **Grounding Separately Derived Supply.** For distributed cabinets where 120V supply is not derived from the main fire alarm power supply, a green insulated equipment grounding conductor shall be sized and installed in accordance with Article 250, Table 250.122 (#10 AWG minimum). In steel framed buildings, an additional connection to local steel shall be permitted.

Section 760.41

Section 760.41 - Delete the section and replace to read as follows:

760.41 Power Source Requirements. The power source for fire alarm circuits shall comply with the following:

(A) **Primary Power Source.** All fire alarm circuits shall be provided with a primary power source. The primary power source shall be generated electric power not exceeding 277/480 volts, supplied by utility company power or isolated plant. The primary power supply to the fire alarm system shall comply with the following:

(1) Primary power supply for the fire alarm system shall be connected to the primary power source ahead of all building service disconnecting means so that the building service disconnecting means can be opened without de-energizing the fire alarm supply. All utility metering of the fire alarm system, including disabling or removal of meters, shall maintain power continuity to the fire alarm system at all times.

(2) Primary power supply for sub-systems or other limited interior fire alarm systems may be connected to the power supply through the protected area of such systems by means of a connection ahead of the disconnecting means for the power supply to the protected area.

FPN: Sub-systems and limited interior fire alarm systems may also use the connected means defined in paragraph (1) above where available.

(B) **Secondary Power Source.** Where an emergency power system is provided or required to be provided for emergency system loads, the fire alarm circuits shall be provided with a secondary power source. Batteries shall not be a substitute for connection to a secondary power source. The secondary power source shall comply with the requirements for emergency power systems and/or an emergency generator that are used for emergency systems loads as articulated below:

(1) Emergency power systems complying with Chapter 27 of the New York City Building Code shall be permitted to serve as a secondary power source; or

(2) Emergency power systems and/or emergency generators in existing buildings in compliance with Title 27, Chapter 1, Subchapter 6, Section 27-396.4 of the New York City Administrative Code (also referred to as the 1968 Building Code) shall be permitted to serve as the secondary power source.

The secondary power supply shall be connected such that all other disconnecting means serving other building emergency loads can be opened without de-energizing the facility fire alarm secondary power supply.

FPN: The use of a main disconnecting means on the output of the generator(s) is permitted where disconnect of all other loads does not interrupt the facility fire alarm system secondary power supply.

(C) Battery. Regardless of whether a secondary power source is also provided, each fire alarm system and subsystem shall be equipped with a storage battery power supply sized to meet the operating power requirements of the system in accordance with paragraphs (1), (2) or (3) below and shall automatically connect to and operate the fire alarm system upon failure of the primary or secondary power supply or sources. Batteries shall not be a substitute for connection to a secondary power source when a secondary power source is required pursuant to subsection (B) above.

(1) Supervisory operation for 24 hours followed by full load operation for 6 hours for systems with voice communications capability.

FPN: A 45 minute period of voice/alarm operation at maximum connected load shall be considered equivalent to 6 hours of total system operation.

(2) Supervisory operation for 24 hours followed by full load operation for 15 minutes for systems without voice communications capability.

(3) Supervisory operation for 24 hours followed by full load operation for 5 minutes for sub-systems or other limited interior fire alarm systems operating within a facility that reports to the overall facility fire alarm system.

(D) Arrangement of Power Sources. One source of power shall be connected to the fire alarm system at all times. The primary and secondary power sources shall be arranged and controlled by automatic transfer switches dedicated to the fire alarm system such that when the primary source of power fails, the secondary source will be connected automatically to the fire alarm system. The following conditions shall also be observed:

(1) Intermediary devices between the system supply and the source of power, other than fused disconnect switches, transformers and automatic transfer switches are prohibited. Such disconnect switches, transformers and automatic transfer switches shall supply only the fire alarm system and other systems specifically permitted by the New York City Construction Codes, New York City Fire Code, and Rules of the City of New York.

(2) The primary source of power and the secondary source of power shall each be provided with a means of disconnect from the fire alarm system. Each disconnect shall consist of a fused disconnect switch, locked in the ON position with key kept on premises accessible only to authorized personnel. Such disconnect shall be painted red and permanently identified as fire alarm circuit and labeled as to system/location served, with a means of interrupting the unfused neutral and all ungrounded conductors.

(3) For buildings served at up to 300 volts to ground, the service voltage shall be transformed to 120/208 volts and a fire alarm fused disconnect provided within a circuit length of ten 3.05 m (10 ft.), shall be connected at the transformer secondary on the 120/208 volt side. The fire alarm system fused disconnect switch on the transformer secondary side shall comply with the requirements of the primary and secondary power source fused disconnect switches specified above. Fused cutouts shall be provided where multiple circuits are required to support the fire alarm system and related auxiliaries mounted in a fused cutout panel suitable for the number of circuits needed.

Section 760.43

Section 760.43 - Revise the first sentence by replacing “14 AWG” with “12 AWG” and delete the last sentence.

Section 760.45

Section 760.45 - Delete the exceptions and the FPN in their entirety.

Section 760.46

Section 760.46 - Revise to read as follows:

760.46 NPLFA Circuit Wiring. Installation of non-power limited fire alarm circuits shall be in accordance with applicable portions of 110.3(B), 300.7, 300.15, 300.17 and other appropriate articles of Chapter 3 using raceway methods described in Articles 342 and 344 or Type MI cable in accordance with Article 332.

Exception No.1: As provided in 760.48 through 760.53.

Exception No. 2: Where other articles of the New York City Electrical Code require other methods.

Section 760.48

Subsection 760.48(A) - Revise to read as follows:

(A) **NPLFA Circuits.** NPLFA circuits shall not be permitted to occupy the same cable, enclosure or raceway with circuits of other systems.

Subsection 760.48(B) - Revise to read as follows:

(B) **Fire Alarm with Power-Supply Circuits.** Power supply and fire alarm circuit conductors shall be permitted in the same enclosure only where connected to the same equipment.

Section 760.49

Subsection 760.49(A) - Revise to read as follows:

(A) **Size and Use.** Only copper conductors #12 AWG and larger shall be permitted to be used as NPLFA circuit conductors.

Subsection 760.49(B) - Delete the FPN and revise to read as follows:

(B) **Insulation.** Insulation on conductors shall be suitable for 600 volts, 90°C, and shall comply with Article 310. Conductors shall be Type THHN, THWN/THHN, TFFN, TFN, FEP, RHH, RHW2, XHH, XHHW, MI or CI-NYC Certified Cable. Application of conductor ampacity shall be in accordance with 110.14 for terminal device ratings.

Subsection 760.49(C) - Revise to read as follows:

(C) **Conductor Materials.** Conductors shall be solid copper up to size #10 AWG. Stranded copper conductors shall be used for sizes #8 AWG and larger.

Section 760.51

Subsection 760.51(A) - Delete: “and Class 1 Circuits” in title and “and Class1 circuit” in text.

Subsection 760.51(B) - Delete the subsection in its entirety.

Subsection 760.51(C) - Revise to read as follows:

(C) **Cable Trays.** Where non-power limited fire alarm circuit conductors are installed in cable trays, they shall comply with 392.9 through 392.11 and shall be barriered from any other wiring installed in the cable tray.

Section 760.52

Section 760.52 - Add a new section 760.52 to read as follows:

760.52 Mechanical Execution of Work. Installation shall conform to the following:

(A) Mechanical Rooms, Elevator Rooms, Garages and Loading Docks. All wiring installed up to 2.4 m (8 ft.) above the finished floor in garages, loading docks, mechanical rooms, and elevator rooms shall be installed in raceway pursuant to Article 344. All wiring installed above 2.4 m (8 ft.) shall be installed pursuant to Articles 332, 342, 344 or 358.

Exception: For mechanical rooms and elevator rooms having a floor area of less than 83.61 m² (900 ft.²), installation pursuant to Articles 332, 342, 344 or 358 is permitted without height limitation.

(B) Installation. Installation of raceways, boxes, enclosures, cabinets, and wiring shall conform to the following requirements:

- (1) Covers of boxes, enclosures and cabinets shall be painted red and permanently identified as to use.
- (2) Penetrations through rated walls, ceilings and floors shall be fire stopped.
- (3) Raceways or wiring shall not penetrate the top of any control equipment cabinet or enclosure.
- (4) Raceways installed up to 2.4 m (8 ft.) in stairways shall not reduce or obstruct required stairway radius or egress path.

Section 760.53

Section 760.53 - Delete the section and replace to read as follows:

760.53 Fire Alarm Circuit Integrity (CI) Cable. Cables suitable for use in fire alarm systems to ensure survivability of critical circuits during a specified time under fire conditions shall be listed as circuit integrity cable. Cables so identified shall have the classification "CI-NYC certified fire alarm cable."

Section 760.121

Section 760.121 - Delete FPN Nos. 1 and 2 in their entirety.

Section 760.124

Section 760.124 - Delete the FPN in its entirety.

Section 760.127

Section 760.127 - Delete the exception in its entirety.

Section 760.130

Subsection 760.130(A) - Revise exception 2 by adding, "760.51" after "760.49" and delete exception No. 3 and the FPN in their entirety.

Subsection 760.130(B) - Revise the last sentence to read as follows:

Devices shall be installed in accordance with Sections 110.3(B), 300.11(A) and 300.15 with all wiring supported independently from the building structure.

Subsection 760.130(B)(1) - Revise to read as follows:

(1) Exposed or Fished in Concealed Spaces. In raceway or exposed above 2.4 m (8 ft.) on the surface of ceiling and sidewalls or fished in concealed spaces, cable splices or terminations shall be made in listed fittings, boxes, enclosures, fire alarm devices or utilization equipment. Where installed exposed, cables shall be supported at a maximum of 1.5 m (5 ft.) spacing and installed in such a way that maximum protection against physical damage is

afforded by building construction. Where located within 2.4 m (8 ft.) of the floor, cables shall be installed in raceway pursuant to Article 342, 344, 358 or 386.

Subsection 760.130(B)(2) - Revise to read as follows:

(2) Passing Through a Floor or Wall. In metal raceways where passing through a wall or floor to a height of 2.4 m (8 ft.) above the floor, unless protection can be afforded by building construction such as detailed in 760.130(B)(1) or unless an equivalent solid guard is provided.

FPN: Protected by building construction includes raised floors, shafts, telephone and communications equipment rooms and closets, and rooms used exclusively for fire alarm equipment.

Subsection 760.130(B)(3) - Delete: "rigid nonmetallic conduit,".

Subsection 760.130(B)(4) - Add a new subsection 760.130(B)(4) to read as follows:

(4) Terminations and Splices. Terminations and splices shall be made with terminal blocks and in listed fittings, boxes, enclosures, fire alarm devices or utilization equipment. Splices shall be limited to locations where the conditions of installation require the use of splices. Splices and terminations in riser cables are prohibited except where made in fire alarm equipment terminal cabinets. Mechanical connections listed under Underwriters Laboratories ("UL") 486-03, A & C shall be used for the conductors, or if soldered, first joined so as to be mechanically and electrically secure prior to soldering. Temperature rating of the completed splices shall equal or exceed the temperature rating of the highest rated conductor.

Section 760.131

Section 760.131 - Add a new section 760.131 to read as follows:

760.131 Mechanical Execution of Work. Installation shall conform to the following requirements.

(A) Mechanical Rooms, Elevator Rooms, Garages and Loading Docks. All wiring installed up to 2.4 m (8 ft.) above the finished floor in garages, loading docks, mechanical rooms, and elevator rooms shall be installed in raceway pursuant to Article 344.

Exception: For mechanical rooms and elevator rooms having a floor area of less than 83.61 m² (900 ft.²), installation pursuant to Articles 332, 342, 344 or 358 is permitted without height limitation.

(B) Extinguishing Systems. Extinguishing and suppression systems activated by automatic fire detection and using fire alarm cables shall be installed pursuant to Article 332, 342, 344 or 358. Such systems shall include, but not be limited to, pre-action sprinkler, deluge sprinkler, water mist, clean air agent, Halon, range hood, CO₂, and dry chemical systems.

(C) Installation. Installation of raceways, boxes, enclosures, cabinets, and wiring shall conform to the following requirements:

- (1) Covers of boxes, enclosures and cabinets shall be painted red and permanently identified as to use.
- (2) Penetrations through rated walls, ceilings and floors shall be fire stopped.
- (3) Raceways or wiring shall not penetrate the top of any control equipment cabinet or enclosure.
- (4) Raceways installed up to 2.4 m (8 ft.) in stairways shall not reduce or obstruct required stairway radius or egress path.
- (5) Cables shall be secured by cable ties, straps or similar fittings designed and installed so as not to damage the cables. Such fitting shall be secured in place at intervals not exceeding 1.5 m (5 ft.) on center and within 0.3 m (1 ft.) of associated cabinet or box.

Section 760.136

Subsection 760.136(D)(2)(a) - Revise to read as follows:

(a) The fire alarm power-limited circuits are installed using Type FPL, FPLP or permitted substitute cables with Type FPLP 'NYC certified fire alarm cable' or other NYC certified fire alarm cable, provided that these power-limited cable conductors extending beyond the jacket are separated by a minimum of 6 mm (0.25 in) or by a nonconductive barrier from all other conductors.

Subsection 760.136(D)(2)(b) - Delete the subsection in its entirety.

Subsection 760.136(F) - Delete: "rigid nonmetallic conduit" and "liquidtight flexible nonmetallic conduit".

Subsection 760.136(G)(1)(b) – Revise to read as follows:

(b) all of the power-limited fire alarm circuit conductors are in a raceway or in metal-sheathed or metal-clad cables.

Section 760.139

Section 760.139 - Delete the section in its entirety.

Section 760.142

Section 760.142 - Revise to read as follows:

760.142 Conductor Size. Conductors shall not be smaller than #18 AWG in size.

Section 760.143

Section 760.143 - Revise to read as follows:

760.143 Support of Conductors. Power-limited fire alarm circuit conductors shall not be strapped, taped, or attached by any means to the exterior of any piping, duct, conduit, or raceway as a means of support.

Section 760.154

Subsection 760.154(A) - Revise to read as follows:

(A) **Cables in Other Spaces Used for Environmental Air.** Cables installed in other spaces used for environmental air, or where permitted to run exposed in other areas, shall be Type FPLP 'NYC certified fire alarm cable'.

Subsection 760.154(B)(1) - Revise by replacing "Type FPLR" with: "Type FPLP 'NYC certified fire alarm cable' or other NYC certified fire alarm cable" in each of the two locations.

Subsection 760.154(B)(2) - Revise by replacing "Other" with: "Type FPLP 'NYC certified fire alarm cable'".

Subsection 760.154(C) - Delete the subsection and revise to read as follows:

(C) **Other Wiring Within Buildings.** Cables installed in building locations other than those covered in 760.154(A) or (B) shall be Type FPLP 'NYC certified fire alarm cable.'

Subsection 760.154(D) - Delete FPN, table 760.154(D) and figure 760.154(D) and revise to read as follows:

(D) **Fire Alarm Cable Substitutions.** Substitutions of Type FPLP or NYC certified fire alarm cables shall not be permitted.

Section 760.176

Section 760.176(G) - Delete the first sentence of the first paragraph, the FPN and the table in their entirety.

Section 760.179

Section 760.179 - Revise the title to read as follows:

760.179 Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors.

Subsection 760.179(B) - Revise to read as follows:

(B) Conductor Size. The size of conductors in single or multi-conductor cables shall not be smaller than 18 AWG.

Subsection 760.179(D) - Delete the FPN and revise to read as follows:

(D) Type FPLP. Type FPLP power-limited fire alarm cable shall be listed to UL 1424-05, Standard for Cables for Power-Limited- Fire-Alarm Circuits with the listing agency certifying compliance with the following additional requirements:

- (1) Type FPLP only; minimum insulation thickness 15 mils; minimum temperature 150°C.
- (2) Red colored jacket overall; minimum thickness 25 mils.
- (3) Cable marked as per UL 1424 must bear additional description "ALSO CLASSIFIED NYC CERT. FIRE ALARM CABLE" legible without removing jacket.

Subsection 760.179(E) - Delete the subsection in its entirety.

Subsection 760.179(F) - Delete the subsection in its entirety.

Subsection 760.179(G) - Revise by deleting the parenthetic "CI" in the first sentence of the first paragraph and replacing with "CI-NYC certified Circuit Integrity fire alarm cable" and by deleting, "(E), (F)" in the second sentence of the first paragraph.

Subsection 760.179(H) - Replace "Type FPLP, FPLR, or FPL cable" at the end of the sentence with "Type FPLP 'NYC certified fire alarm cable'."

Subsection 760.179(I) - Delete the subsection and revise to read as follows:

(I) Cable Marking. The cable shall be marked in accordance with subsection 760.179(D)(3) and its rating as 'NYC Cert. Fire Alarm Cable' or 'NYC Cert. Circuit Integrity Cable.'

Subsection 760.179(J) - Revise by deleting "through (F)" in the fourth line of the paragraph.

Subsection 760.179(K) - Add new subsection 760.179(K) to read as follows:

760.179(K) Listed Fire-Rated Assemblies. MI cable meeting the requirements of Article 332 or listed fire-rated assemblies that have a minimum fire rating of 2 hours shall be permitted when installed in accordance with the listing requirements.