

A. General

820-1. Scope. This article covers coaxial cable distribution of radio frequency signals typically employed in community antenna television (C.A.T.V.) systems. Where the wiring system employed is other than coaxial, Article 800 shall apply.

The coaxial cable shall be permitted to deliver low-energy power to equipment directly associated with this radio frequency distribution system if the voltage is not over 60 volts and if the current supply is from a transformer or other device having energy-limiting characteristics.

820-2. Material. Coaxial cable used for radio frequency distribution systems shall be suitable for the application.

B. Protection

820-7. Ground of Outer Conductive Shield of a Coaxial Cable. Where coaxial cable is exposed to lightning or to accidental contact with lightning arrester conductors or power conductors operating at a potential of over 300 volts to ground, the outer conductive shield of the coaxial cable shall be grounded at the building premises as close to the point of cable entry as practicable.

(a) Shield Grounding. Where the outer conductive shield of a coaxial cable is grounded, no other protective devices shall be required.

(b) Shield Protective Devices. Grounding of a coaxial drop cable shield by means of a protective device that does not interrupt the grounding system within the premises shall be permitted.

C. Installation of Cable

820-11. Outside Conductors. Coaxial cables, prior to the point of grounding, as defined in Section 820-7, shall comply with (a) through (e) below.

(a) On Poles. Where practicable, conductors on poles shall be located below the light or power conductors and shall not be attached to a cross-arm that carries light or power conductors.

(b) Lead-in Clearance. Lead-in or aerial-drop cables from a pole or other support, including the point of initial attachment to a building or structure, shall be kept away from electric light or power circuits so as to avoid the possibility of accidental contact.

Exception: Where proximity to electric light or power service conductors cannot be avoided, the installation shall be such as to provide clearances of not less than 12 inches (305 mm) from light or power service drops.

(c) Over Roofs. Cables passing over buildings shall be at least 8 feet (2.44 m) above any roof that is accessible for pedestrian traffic.

(d) Between Buildings. Cables extending between buildings and also the supports or attachment fixtures shall be acceptable for the purpose and shall have sufficient strength to withstand the loads to which they may be subjected.

Exception: Where a cable does not have sufficient strength to be self-supporting, it shall be attached to a supporting messenger cable that, together with the attachment fixtures or supports, shall be acceptable for the purpose and shall have sufficient strength to withstand the loads to which they may be subjected.

(e) On Buildings. Where attached to buildings, cables shall be securely fastened in such a manner that they will be separated from other conductors as follows:

(1) Light or Power. The coaxial cable shall have a separation of at least 4 inches (102 mm) from light or power conductors not in conduit or cable, or be permanently separated from conductors of the other system by a continuous and firmly fixed nonconductor in addition to the insulation on the wires.

(2) Other Communication Systems. Coaxial cable shall be installed so that there will be no unnecessary interference in the maintenance of the separate systems. In no case shall the conductors, cables, messenger strand, or equipment of one system cause abrasion to the conductors, cable, messenger strand, or equipment of any other system.

(3) Lightning Conductors. Where practicable, a separation of at least 6 feet (1.83 m) shall be maintained between any coaxial cable and lightning conductors.

820-13. Conductors Inside Buildings. Beyond the point of grounding, as defined in Section 820-7, the cable installation shall comply with (a) through (d) below.

(a) Light or Power. Coaxial cable shall be separated at least 2 inches (50.8 mm) from conductors of any light or power circuits or Class 1 circuits.

Exception No. 1: Where the light or power or Class 1 circuit conductors are in a raceway, or in metal-sheathed, metal-clad, nonmetallic-sheathed, or Type UF cables.

Exception No. 2: Where the conductors are permanently separated from the conductors of the other circuit by a continuous and firmly fixed nonconductor, such as porcelain tubes or flexible tubing, in addition to the insulation on the wire.

(b) In Raceways and Boxes. Coaxial cable shall not be placed in any raceway, compartment, outlet box, junction box, or other enclosures with conductors of light or power circuits or Class 1 circuits.

Exception No. 1: Where the conductors of the different systems are separated by a permanent partition.

Exception No. 2: Conductors in outlet boxes, junction boxes, or similar fittings or compartments where such conductors are introduced solely for power supply to the coaxial cable system distribution equipment or for power connection to remote-control equipment.

(c) In Shafts. Coaxial cable installed in the same shaft with conductors for light or power shall be separated from the light or power conductors by not less than 2 inches (50.8 mm).

Exception No. 1: Where the conductors of either system are encased in noncombustible tubing.

Exception No. 2: Where the light or power conductors are in a raceway, or in metal-sheathed, metal-clad, nonmetallic-sheathed, or Type UF cables.

(d) Vertical Runs. Coaxial cables bunched together in a vertical run in a shaft shall have a fire-resistant covering capable of preventing the carrying of flame from floor to floor.

Exception: Where cables are encased in noncombustible tubing or are located in a fireproof shaft having fire stops at each floor.

There is no specific separation requirement between Class 2 or Class 3 circuits, wired distribution system cables, and communication cables or conductors, other than the clearance necessary to prevent conflict or abrasion.

820-14. Spread of Fire or Products of Combustion. Installations in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be so made that the possible spread of fire or products of combustion will not be substantially increased. Openings around penetrations through fire resistance rated walls, partitions, floors, or ceilings shall be firestopped using approved methods.

820-15. Location. Circuits and equipment installed in ducts and plenums shall also comply with Section 300-22 as to wiring methods.

Exception: Coaxial cables listed as having adequate fire-resistant and low-smoke producing characteristics shall be permitted for ducts, hollow spaces used as ducts, and plenums other than those described in Section 300-22(a).

#### D. Underground Circuits

820-18. Entering Buildings. Underground coaxial cables in a duct, pedestal, handhole, or manhole containing electric light or power conductors shall be in a section permanently separated from such conductors by means of a suitable barrier.

**E. Grounding**

Coaxial cable shall be grounded as specified in (a) through (h) below.

(a) Insulation. The grounding conductor shall have a rubber or other suitable kind of insulation.

(b) Material. The grounding conductor shall be copper or other corrosion-resistant conductive material, stranded or solid.

(c) Size. The grounding conductor shall not be smaller than No. 18; it shall have an ampacity approximately equal to that of the outer conductor of the coaxial cable.

(d) Run in Straight Line. The grounding conductor shall be run to the grounding electrode in as straight a line as practicable.

(e) Physical Protection. Where necessary, the grounding conductor shall be guarded from physical damage.

(f) Electrode. The grounding conductor shall be connected as follows:

(1) To the nearest accessible location on the building or structure grounding electrode system as covered in Section 250-81; or

(2) To the metallic power service conduit, service-equipment enclosure, or grounding electrode conductor where the grounded conductor of the power service is connected to the grounding electrode system; or

(3) If the building or structure served has no grounding means as described in (f)(1) or (f)(2), to the grounding electrode, grounding electrode conductor, metallic service conduit or service-equipment enclosure of the power service, where the service is grounded in accordance with Article 250, Part H; or

(4) If the building or structure served has no grounding means as described in (f)(1), (f)(2), or (f)(3), to any one of the individual electrodes described in Section 250-81; or

(5) If the building or structure served has no grounding means as described in (f)(1), (f)(2), (f)(3), or (f)(4), to: (1) an effectively grounded metal structure; or (2) a continuous and extensive underground gas piping system where acceptable to both the serving gas supplier and to the authority having jurisdiction; or (3) to a ground rod or pipe driven into permanently damp earth. Steam or hot water pipes or lightning-rod conductors shall not be employed as electrodes.

(g) Electrode Connection. Connections to grounding electrodes shall comply with Section 250-115. Where a gas pipe electrode is used, connection shall be made between the gas meter and the street main. In every case the connection to the grounding electrode shall be made as close to the earth as practicable.

(h) Bonding or Electrodes. A bonding jumper not smaller than No. 6 copper or equivalent shall be connected between the antenna systems and the power grounding electrodes where the requirements of (f) above result in the use of separate electrodes. Bonding together of all separate grounding electrodes shall be permitted.

See Section 250-86 for use of lightning rods.

820-23. Equipment Grounding. Unpowered equipment and enclosures or equipment powered by the coaxial cable shall be considered grounded where connected to the metallic cable shield.