

of over 250 volts between conductors, except that in the case of circuits not over 150 volts between conductors, if all conductors involved are supported so as to ensure permanent separation, the clearance shall be permitted to be reduced but shall not be less than 100 mm (4 in.). The clearance between lead-in conductors and any conductor forming a part of a lightning protection system shall not be less than 1.8 m (6 ft). Underground conductors shall be separated at least 300 mm (12 in.) from conductors of any light or power circuits or Class 1 circuits.

Exception: The separation and clearance requirements shall not apply if the electric light or power conductors, Class 1 conductors, or lead-in conductors are installed in raceways or metal cable armor.

Informational Note No. 1: See 250.60 for grounding associated with lightning protection components — strike termination devices. See NFPA 780-2020, *Standard for the Installation of Lightning Protection Systems*, for detailed information on grounding, bonding, and spacing from lightning protection systems, and the calculation of specific separation distances using the sideflash equation in Section 4.6.

Informational Note No. 2: See NFPA 780-2020, *Standard for the Installation of Lightning Protection Systems*, for information on bonding or separation of metal raceways, enclosures, frames, and other non-current-carrying metal parts of electrical equipment installed on a building equipped with a lightning protection system. Separation from lightning protection conductors is typically 1.8 m (6 ft) through air or 900 mm (3 ft) through dense materials such as concrete, brick, or wood.

Δ (B) **Antennas and Lead-ins — Indoors.** Indoor antennas and indoor lead-ins shall not be run nearer than 50 mm (2 in.) to conductors of other wiring systems in the premises unless one of the following conditions applies:

- (1) The other conductors are in metal raceways or cable armor.
- (2) The indoor antennas and indoor lead-ins are permanently separated from such other conductors by a continuous firmly fixed nonconductor.

(C) **In Boxes or Other Enclosures.** Indoor antennas and indoor lead-ins shall be permitted to occupy the same box or enclosure with conductors of other wiring systems if separated from such other conductors by an effective permanently installed barrier.

810.19 Electrical Supply Circuits Used in Lieu of Antenna — Receiving Stations. If an electrical supply circuit is used in lieu of an antenna, the device by which the radio receiving set is connected to the supply circuit shall be listed.

The connecting device is usually a small, fixed capacitor connecting the antenna terminal of the receiver and one wire of the supply circuit. As is the case with most receivers, the capacitor should be designed for operation at not less than 300 volts. This voltage rating ensures a high degree of safety and minimizes the possibility of a breakdown in the capacitor, thereby avoiding a short circuit to ground through the antenna coil of the set.

810.20 Antenna Discharge Units — Receiving Stations.

Δ (A) **General Requirement.** Each lead-in conductor from an outdoor antenna shall be provided with a listed antenna discharge unit.

Exception: A separate antenna discharge unit is not required if the lead-in conductors are enclosed in a continuous metal shield that complies with one of the following:

- (1) Is grounded or bonded with a conductor in accordance with 810.21
- (2) Is protected by an antenna discharge unit

An antenna discharge unit (lightning arrester) is not required if the lead-in conductors are enclosed in a continuous metal shield, such as rigid metal conduit (RMC) or intermediate metal conduit (IMC), electrical metallic tubing, or any metal raceway or metal-shielded cable that is effectively grounded. A lightning discharge will take the path of lower impedance and jump from the lead-in conductors to the metal raceway or shield rather than take the path through the antenna coil of the receiver.

(B) **Location.** Antenna discharge units shall be located outside the building or inside the building between the point of entrance of the lead-in and the radio set or transformers and as near as practicable to the entrance of the conductors to the building. The antenna discharge unit shall not be located near combustible material or in a hazardous (classified) location as defined in accordance with 500.5 and 505.5.

(C) **Grounding or Bonding.** The antenna discharge unit shall be grounded or bonded in accordance with 810.21.

810.21 Bonding Conductors and Grounding Electrode Conductors — Receiving Stations. Bonding conductors and grounding electrode conductors shall comply with 810.21(A) through 810.21(K).

(A) **Material.** The bonding conductor or grounding electrode conductor shall be of copper, aluminum, copper-clad steel, copper-clad aluminum, bronze, or similar corrosion-resistant material. Aluminum or copper-clad aluminum bonding conductors or grounding electrode conductors shall not be used if subject to corrosive conditions or in direct contact with masonry or the earth or where subject to corrosive conditions. If used outside, aluminum or copper-clad aluminum conductors shall not be installed within 450 mm (18 in.) of the earth.

(B) **Insulation.** Insulation on bonding conductors or grounding electrode conductors shall not be required.

(C) **Supports.** The bonding conductor or grounding electrode conductor shall be securely fastened in place and shall be permitted to be directly attached to the surface wired over without the use of insulating supports.

Exception: Where proper support cannot be provided, the size of the bonding conductors or grounding electrode conductors shall be increased proportionately.