

Reference Material on Use of 6 AWG Copper for Bonding Jumper

NFPA 70®-2008 Edition of the National Electrical Code®

250.53: Grounding Electrode System Installation.

(C) Bonding Jumper. The bonding jumper(s) used to connect the grounding electrodes together to form the grounding electrode system shall be installed in accordance with 250.64(A), (B), and (E) shall be sized in accordance with 250.66, and shall be connected in the manner specified in 250.70.

250.66: Size of Alternating-Current Grounding Electrode Conductor. The size of the grounding electrode conductor of a grounded or ungrounded ac system shall not be less than given in Table 250.66, except as permitted in 250.66(A) through (C).

(A) Connections to Rod, Pipe, or Plate Electrodes. Where the grounding electrode conductor is connected to rod, pipe, or plate electrodes as permitted in 250.52(A)(5) or (A)(6), that portion of the conductor that is the sole connection to the grounding electrode shall not be required to be larger than 6 AWG copper wire or 4 AWG aluminum wire.

Table 250.66: Grounding Electrode Conductor for A-C Systems:

Size of Service Entrance Conductor:

2 or smaller =>	8 AWG Copper
1 or 1/0 =>	6 AWG Copper
2/0 or 3/0 =>	4 AWG Copper

250.64: Grounding Electrode Conductor Installation. Grounding Electrode Conductors shall be installed as specified in 250.64(A) through (F).

250.64(B): Securing and Protection Against Physical Damage. When exposed, a grounding electrode conductor or its enclosure shall be securely fastened to the surface on which it is carried. A 4 AWG or larger copper or aluminum grounding electrode conductor shall be protected where exposed to physical damage. A 6 AWG grounding electrode conductor that is free from exposure to physical damage shall be permitted to be run along the surface of the building construction without metal covering or protection where it is securely fastened to the construction; otherwise it shall be in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, electrical metallic tubing, or cable armor. Grounding electrode conductors smaller than 6 AWG shall be in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, electrical metallic tubing, or cable armor.

250.104 Bonding of Piping Systems and Exposed Structural Steel

(A) Metal Water Piping. The metal water piping system shall be bonded as required in (A)(1), (A)(2), or (A)(3) of this section. The bonding jumper(s) shall be installed in accordance with 250.64(A), (B), and (E). The points of attachment of the bonding jumper(s) shall be accessible.

(1) General. Metal water piping systems(s) installed in or attached to a building or structure shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to the one or more grounding electrodes used. The bonding jumper(s) shall be sized in accordance with **Table 250.66** except as permitted in 250.104(A)(2) and (A)(3). {(A)(2): Buildings of Multiple Occupancy; (A)(3): Multiple Buildings or Structures Supplied by a Feeder(s) or Branch Circuit(s).}

(B) Other Metal Piping. Where installed in or attached to a building or structure, metal piping system(s), including gas piping, that is likely to become energized shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to one or more grounding electrodes used. The bonding jumper(s) shall be sized in accordance with **250.122**, using the rating of the circuit that is likely to energize the piping system(s). The equipment grounding conductor for the circuit that is likely to energize the piping shall be permitted to serve as the bonding means. The points of attachment of the bonding jumper(s) shall be accessible.

FPN: Bonding all piping and metal air ducts within the premises will provide additional safety.

250.122: Sizing of Equipment Grounding Conductors.

(A) General. Copper, aluminum, or copper-clad aluminum equipment grounding conductors of the wire type shall not be smaller than shown in **Table 250.122** but shall not be required to be larger than the circuit conductors supplying the equipment.

Table 250.122: Minimum Size Equipment Grounding Conductors for Grounding Raceways and Equipment:

100 AMP => 8 AWG Copper

200 AMP => 6 AWG Copper

250.120: Equipment Grounding Conductor Installation. An equipment grounding conductor shall be installed in accordance with 250.120(A), (B) and (C).

(C) Equipment Grounding Conductors Smaller Than 6 AWG. Equipment Grounding Conductors Smaller Than 6 AWG shall be protected from physical damage by a raceway or cable armor except where run in hollow spaces of walls or partitions, where not subject to physical damage, or where protected from physical damage.

800.100: Cable and Primary Protector Grounding (Communications)

(D) Bonding Electrodes. A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the communications grounding electrode and power grounding electrode system at the building or structure served where separate electrodes are used.

810.21: Grounding Conductors – Receiving Stations (Radio and Television Equipment)

(J) Bonding of Electrodes. A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the radio and television equipment grounding electrode and power grounding electrode system at the building or structure served where separate electrodes are used.

820.100: Cable Grounding (Community Antenna Television and Radio Distribution Systems)

(D) Bonding of Electrodes. A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the community antenna television system's grounding electrode and power grounding electrode system at the building or structure served where separate electrodes are used.

830.100: Cable, Network Interface Unit, and Primary Protector Grounding (Network-Powered Broadband Communications Systems)

(D) Bonding of Electrodes. A bonding jumper not smaller than 6 AWG copper or equivalent shall be connected between the network-powered broadband communications system grounding electrode and power grounding electrode system at the building or structure served where separate electrodes are used.

NFPA 780-2008 Standard for the Installation of Lightning Protection Systems

4.1.1.1 (A): Ordinary structures not exceeding 23-m (75ft) in height shall be protected with Class I materials as shown in Table 4.1.1.1 (A).

Table 4.1.1.1 (A) Minimum Class I Material Requirements: Bonding Conductor, cable (solid or stranded): Cross section area = 26,240 cir mils for copper wire

NOTE: 6 AWG wire has a cross sectional area of 26,251 cir mils.

4.19.2.2: Conductors used for the bonding of grounded metal bodies or isolated metal bodies requiring connection to the lightning protection system shall be sized in accordance with bonding conductor requirements in Table 4.1.1.1 (A) and Table 4.1.1.1 (B).