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17155 Grounding and Bonding

A) General Requirements

A uniform telecommunications grounding and bonding infrastructure shall be provided for the protection of personnel and equipment conforming to all applicable codes and standards including but not limited to the current National Electric Code (NEC) Articles 250 (Grounding) and 800 (Communications Circuits), ANSI/TIA-607-C, Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises, and the current versions of the National Fire Protection Association (NFPA) publications NFPA 70E "Electrical Safety Requirements for Employee Workplaces", NFPA 75 "Protection of Electronic Computer/Data Processing Equipment" and NFPA 780 "Lightning Protection Code".

These are minimum requirements and do not replace federal, state, local, or other applicable codes, laws, or regulations which may have priority.

B) Grounding and Bonding Infrastructure

The Grounding and Bonding Infrastructure shall consist of the following major components:

- Primary Bonding Busbar (PBB)
- Telecommunications Bonding Conductor (TBC)

And may also include the following:

- Telecommunications Bonding Backbone (TBB)
- Secondary Bonding Busbar (SBB)
- Backbone Bonding Conductor (BBC)

All bonding conductors must be sized accordingly, see ANSI/TIA-607-C.

a) Primary Bonding Busbar / Telecommunications Bonding Conductor

A Primary Bonding Busbar (PBB) must be provided and located in the Telecommunications Entrance Room or Space.

The PBB must be mounted with insulated stand-offs.

PBB shall be mounted at 18 inch above finished floor, unless noted otherwise.

In steel structures, the PBB shall be bonded to building steel.

Where a panel board for telecommunications is located in the same room or space as the PBB, that panel's ground bus or the enclosure must be bonded to the PBB.
A Telecommunications Bonding Conductor which consists of an insulated ground copper conductor sized as large as a No. 3/0 AWG but no less than a No. 6 AWG shall be run from the service equipment power ground to the PBB. Locate the PBB near the point where backbone cables are terminated while providing the straightest route and shortest distance possible for the Telecommunications Bonding Conductor from the PBB to the service equipment power ground.

b) Secondary Bonding Busbar(s) / Telecommunications Bonding Backbone

Each Telecommunications Distributor Room shall have a Secondary Bonding Busbar (SBB) installed and shall be interconnected with the PBB via the Telecommunications Bonding Backbone (TBB) in accordance with ANSI/TIA-607-C and the NEC. Cables and equipment shall be bonded as required.

The SBB(s) shall be mounted at 18 inch above finished floor, unless noted otherwise.

In steel structures, the SBB shall be bonded to building steel.

Whenever two or more vertical TBBs are used in a building, the SBBs shall be interconnected at the top of each riser and at every third floor with a Backbone Bonding Conductor (BBC), in accordance with ANSI/TIA-607-C and the NEC.

c) Telecommunications Equipment Bonding Conductor (TEBC)

The TEBC connects the PBB/SBB to equipment racks/cabinets. More than one TEBC may be installed from the PBB/SBB (e.g., a separate TEBC per rack).

C) Grounding Requirements

a) Main Distribution Frames and Service Entrances

Transient protection devices shall be installed according to the requirements of the NEC. Maximum effort should be made to keep the primary protector grounding conductor as short as practical. See ANSI/TIA-607-C Annex D.

b) OSP Cable Sheath Grounding

The metallic sheath of communications cables entering buildings shall be grounded as close as practicable to the point of entrance or shall be interrupted as close to the point of entrance as practicable by an insulating joint or equivalent device.

The point of entrance shall be considered to be at the point of emergence through an exterior wall, a concrete floor slab, or from a grounded rigid metal conduit or an intermediate metal conduit grounded to an electrode in accordance with Section 800-40(b). See NEC Article 800, “Communications Circuits”.

Contractor shall bond the cable shield to the PBB.
All cables entering and leaving splices shall be bonded together. A bond resistance of 1 milliohm (.001 ohm) or less is required. Bonding shall be done with #6 AWG, or larger, insulated wire. Metallic splice cases shall be bonded to the sheath of the feed cable and the local ground.

Sheath clamps shall be installed such that there will be minimal danger of abrasion to conductors.

Backbone cable sheaths must be grounded at the PBB and SBB.

c) Coaxial Cable Grounding

The outer conductive shield of a coaxial cable shall be grounded in the same manner as other telecommunications cable to help limit potential differences between the CATV System and other metallic systems.

d) Voice Backbone Grounding

Insulated wires not smaller than #6 AWG shall connect the backbone cable sheaths to the PBB and the SBBs.

If plenum rated cable conforming to NEC Article 800 type CMP must be used in place of the shielded cable specified, an insulated wire not less than #10 AWG shall be tie-wrapped at regular intervals to the backbone cable (Coupled Bonding Conductor (CBC)) and serve the grounding function of a sheath. The CBC is considered a part of the installed cabling system and not a part of the grounding and bonding infrastructure.

Both ends of backbone cables shall be provided with ground clamps and shall be bonded to the PBB and SBBs.

e) Installation in Conduit

Any grounding or bonding sheath or conductor which is run through a metallic conduit must be bonded to the conduit at both ends using a #6 AWG, or larger, insulated ground wire.
MODIFICATIONS

09/26/03 Modified Title and Filename
10/07/13 Updated ANSI/TIA-607-B Standard Reference
03/03/16 Updated ANSI/TIA-607-C Standard Reference