

**TELECOMMUNICATIONS
INFRASTRUCTURE
SPECIFICATIONS**

- GROUNDING AND BONDING -

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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/EIA-607, "Commercial Building Grounding and Bonding Requirements for Telecommunications", 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.

Splices in bonding or grounding conductors are not allowed.

B) Grounding and Bonding Infrastructure

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

- Bonding Conductor for Communications
- Telecommunications Main Grounding Busbar (TMGB)
- Telecommunications Bonding Backbone (TBB)
- Telecommunications Grounding Busbar(s) (TGB)
- Telecommunications Bonding Backbone Interconnecting Bonding Conductor (TBBIBC)
- Equipment Bonding Conductor(s) (EC)
- Coupled Bonding Conductor(s) (CBC)

a) Telecommunications Main Grounding Busbar / Bonding Conductor for Telecommunications

A Telecommunications Main Grounding Busbar (TMGB) must be provided and located in the Telecommunications Entrance Room, Equipment Room or Space. The TMGB must be mounted with insulated stand-offs.

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

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

Where a panel board for telecommunications is located in the same room or space as the TMGB, that panel's ground bus or the enclosure must be bonded to the TMGB.

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A Bonding Conductor for Telecommunications 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 TMGB. Locate the TMGB near the point where backbone cables are terminated while providing the straightest route and shortest distance possible for the Bonding Conductor for Telecommunications from the TMGB to the service equipment power ground.

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

Each Telecommunications Closet/Room and Equipment Room shall have a Telecommunications Grounding Busbar (TGB) installed and shall be interconnected with the TMGB via the Telecommunications Bonding Backbone (TBB) in accordance with ANSI/TIA/EIA-607 and the NEC. Cables and equipment shall be bonded as required.

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

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

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

c) Equipment Bonding Conductor(s) (EC)

In each room with a TMGB or TGB, the busbar shall be bonded to the panelboard (where provided), all communications equipment within the room and to all conduits entering the room with an insulated conductor no smaller than #6 AWG (25 MCM), in accordance with ANSI/TIA/EIA-607 and the NEC.

C) Grounding Requirements

a) Main Distribution Frames and Service Entrances

Transient protection devices shall be connected to the TMGB or TGB with an insulated conductor no smaller than #6 AWG (25 MCM).

When a protector is installed in a metallic box, bond the protector ground terminal to the box with a #6 AWG ground wire.

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.

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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 TMGB. One ground clamp shall be used for each inch of cable diameter.

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. One ground clamp shall be used for each inch of cable diameter. 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 TMGB and TGB.

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 TMGB and the TGBs. One ground clamp and wire shall be used for each inch of backbone cable diameter.

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 TMGB and TGBs.

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.

f) Inspection

All grounding and bonding connections are subject to the inspection and approval of Rutgers University.

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MODIFICATIONS

926/03 Modified Title and Filename.