

SECTION 270526 - GROUNDING AND BONDING FOR TELECOMMUNICATIONS SYSTEMS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS****A. GENERAL**

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work specified of this section.

B. GENERAL

For grounding rods for Telecommunications refer to specification section 260526. In all cases the applicable electrical codes for grounding and bonding for telecommunications shall be met.

C. SUPPLEMENTAL

Refer to the specification sections identified below for additional requirements, which are supplemented by this section.

1. 270010 Technology General Provisions
2. 270528 Raceways for Technology
3. 271000 Structured Cabling System
4. 260526 Grounding and Bonding For Electrical Systems
5. 264313 Transient Voltage Suppression for Low Voltage

D. GENERAL

For bonding diagram for telecommunications refer to T Drawings.

E. GENERAL

The grounding and bonding approach required herein is intended to work in concert with the cabling topology as specified in Specification section 271000 and installed in accordance with specification section 270528.

F. REFERENCE STANDARDS

1. ANSI/TIA- 607-D
2. ANSI/TIA-568-D
3. ANSI/TIA-569-A
4. ANSI/TIA-606
5. NEMA
6. UL 1863 Communication Circuit Accessories
7. UL-50 & UL-514
8. NFPA 70 – NATIONAL ELECTRIC CODE
9. IEEE Std. 1100-1992, Powering and Grounding Sensitive Electronic Equipment.
10. BICSI TDMM, Telecommunications Distribution Method Manual.
11. UL 1449

12. NFPA 780

G. TELECOMMUNICATIONS MAIN GROUNDING BUSBAR (TMGB)

The TMGB serves as the dedicated extension of the building grounding electrode system for the telecommunications infrastructure. The TMGB shall be located as shown on the drawings. The TMGB must have minimum dimensions of 6.3 mm (0.25 in) thick by 100 mm (4 in) wide, and be variable in length. The TMGB must also be listed by a nationally recognized testing laboratory (NRTL).

H. TELECOMMUNICATIONS GROUNDING BUSBAR (TGB)

The TGBs are the grounding connection points for telecommunications systems and equipment in the area served by that telecommunications room or equipment room. The TGBs shall be located as shown on the drawings. The TGBs must have minimum dimensions of 6.3 mm (0.25 in) thick by 50 mm (2 in) wide, and be variable in length. The TMGB must also be listed by a nationally recognized testing laboratory (NRTL).

I. TELECOMMUNICATION BONDING BACKBONE (TBB)

The TBB is a conductor that interconnects all Telecommunications Grounding Busbars (TGBs) with the Telecommunications Main Grounding Busbar (TMGB) as shown on the drawings.

J. GROUNDING EQUALIZER (GE)

The GE interconnects multiple TBBs as indicated on the drawings.

K. BONDING CONDUCTOR FOR TELECOMMUNICATIONS

The Bonding Conductor for telecommunications shall bond the TMGB to the service equipment (power) ground and shall be, as a minimum, the same size as the TBB.

L. The TBBs, GE and Bonding Conductor for Telecommunications are not intended to serve as the only conductors providing a ground fault current return path. The intended function of the TBBs, GE and Bonding Conductor for Telecommunications is to reduce or equalize potential differences between telecommunications systems.

M. Sizing of TBB and GE

The TBB and GE shall be a copper conductor. Interior water piping or the metallic cable shield shall not be used as a TBB. The minimum TBB or GE conductor size shall be a No 6 AWG. The TBB and GE should be sized at 2 kcmil per linear foot of conductor length up to a maximum of 3/0 AWG. The TBB and GE may be insulated. However, if the TBB or GE is insulated, the insulation shall meet the fire ratings of its pathway and shall be listed for the space in which it is intended to be placed, such as CM, CMR or CMP. The sizing of the TBB or GE is not intended to account for the reduction or control of electromagnetic interference.

TBB OR GE LENGTH LINEAR M (FT)	TBB/GE SIZE (AWG)
Less than 4 (13)	6
4 – 6 (14 – 20)	4
6 – 8 (21 – 26)	3

8 – 10 (27 – 33)	2
10 – 13 (34 – 41)	1
13 – 16 (42 – 52)	1/0
16 – 20 (53 – 66)	2/0
Greater than 20 (66)	3/0

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING MATERIALS FOR TELECOMMUNICATIONS SYSTEMS

A. GENERAL

As specified on specifications section 260526 and as shown on T drawings.

PART 3 - EXECUTION

3.1 GROUNDING AND BONDING FOR TELECOMMUNICATIONS SYSTEMS

A. GENERAL

Specification section 260526 applies to work of this section. Installation requirements specified herein takes precedence over specification section 260526.

- B. The TBB, GE and the Bonding Conductor for Telecommunications shall be installed and protected from physical and mechanical damage.
- C. The TBB and GE conductors shall be continuous and routed in the shortest possible straight line path following telecommunications pathways designed for the backbone cabling as shown on the drawings.
- D. The Bonding Conductor for Telecommunications shall be continuous and routed in the shortest possible straight line path to the service equipment (power) ground.
- E. The TBB, GE and the Bonding Conductor for Telecommunications shall be installed without splices. Where splices are necessary, the number of splices should be a minimum and they shall be accessible and located in telecommunications spaces. Joined segments of a TBB, GE or the Bonding Conductor for Telecommunications shall be connected using exothermic welding, irreversible compression-type connectors, or equivalent. All joints shall be adequately supported and protected from damage.
- F. Connections of the TBB, the GE and the Bonding Conductor for Telecommunications to the TGB or TMGB shall utilize exothermic weld connections, listed compression two-hole lugs or other irreversible compression type connector.
- G. The TGB or TMGB shall be as close to the electrical power panel as is practicable and shall be installed to maintain clearances required by applicable electrical codes. That electrical power panel bus or the panel enclosure shall be bonded to the TGB or TMGB.
- H. The bonding conductor between a TBB and a TGB shall be continuous and routed in the shortest possible straight-line pattern.

- I. All metallic raceways for telecommunications cabling located within the same room or space as the TGB or TMGB shall be bonded to the TGB or TMGB using a minimum No 6 AWG conductor.
- J. The TGBs and TMGB shall be insulated from their support. A minimum of 50 mm (2 inches) separation from the wall is recommended to allow access to the rear of the busbar.
- K. All connectors used for bonding to the metal frame of a building shall be listed for the intended purpose. The TGBs and TMGB shall be bonded to the steel metal frame using a minimum No 6 AWG conductor.
- L. The primary protector grounding conductor shall be connected to the TMGB or TGB. A minimum of 300 mm (1 FT) separation shall be maintained between this insulated conductor and any dc power cables, switchboard cable, or high frequency cables, even when placed in rigid metal conduit or EMT.
- M. When the outside plant cables in the Telecommunications Entrance Facility room incorporate a cable shield isolation gap, the cable shield on the building side of the gap shall be bonded to the TMGB or TGB.
- N. Where backbone cables incorporate a shield or metallic member, this shield or metallic member shall be bonded to the TMGB or TGB.
- O. Telecommunications primary protectors for the interbuilding backbone cables shall be bonded to the TMGB or TGB.
- P. Short metallic pathways (e.g. wall and floor sleeves) are not required to be bonded.