



Section 27 05 26 (Formerly 16740) - GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS SPECIFICATION

1.01 Work Included:

- a. Provide all labor, materials, tools, installation equipment, and test equipment required for the complete installation of grounding and bonding for telecommunications systems within the structure.

1.02 References

- a. ANSI/TIA 607-B – Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
- b. National Fire Protection Association (NFPA – 70), National Electrical Code (NEC) -2011
- c. ANSI T1.333-2001 – Grounding and Bonding of Telecommunications Equipment

1.03 Quality Assurance

- a. The materials and their installation shall conform to the requirements of ANSI/TIA 607-B and the National Electrical Code
- b. Use adequate numbers of skilled work-persons thoroughly trained and experienced on the necessary crafts and completely familiar with the specified requirements and methods needed for the proper performance of the work of this Section.

Part 2 – PRODUCTS

2.01 Standard

- a. All materials used in the installation shall be new and shall comply in weight, size and composition as required by manufacturer and shall be labeled or listed by Underwriters Laboratories Inc. for use in electrical grounding.

2.02 Acceptable Manufactures

- a. Harger Lightning & Grounding
301 Ziegler Drive, Grayslake, IL 60030
(847) 548-8700 • 800-842-7437 • Fax (847) 548-8755
E-mail: hargersales@harger.com • Web-site: www.harger.com

2.03 Telecommunications Main Grounding Busbar (TMGB)

- a. The TMGB shall be Harger catalog number GBI14412TMGB, ¼”T x 4”W x 12”L copper ground bar.
 - I. The TMGB shall be predrilled with holes for use with standard sized lugs.
 - II. The TMGB shall be UL listed and meet the requirements of ANSI/TIA 607-B.
 - III. The TMGB shall be sized as above or lengthened to meet requirements of the immediate application with consideration for future growth.



2.04 Telecommunications Grounding Busbar (TGB)

- a. The TGB shall be Harger catalog number GBI14212TGB, ¼”T x 2”W x 12”L copper ground bar.
 - I. The TMGB shall be predrilled with holes for use with standard sized lugs.
 - II. The TMGB shall be UL listed and meet the requirements of ANSI/TIA 607-B.
 - III. The TMGB shall be sized as above or lengthened to meet requirements of the immediate application with consideration for future growth.

2.05 Conductors

- a. Conductors shall be stranded copper conductors with green insulation
 - I. Minimum conductor size No. 6 AWG.
 - II. Conductors shall be sized at 2 kcmil per linear foot of conductor length. For example: A conductor 25 feet in length shall be No. 2 AWG (66,360 cmil). A conductor 100 feet in length shall be No. 4/0 AWG (211,600 cmil)
 - III. Insulation shall be rated for the environment where it is installed.

2.06 Connector Lugs

- a. Lugs for connecting to the TMGB and TGB shall be UL Listed two-hole, long barrel, electro tin-plated compression lugs with inspection port, Harger series GECLB.
 - I. Antioxidant joint compound, Harger series HCAJC shall be applied to the contact areas.
 - II. Lugs shall be secured to the ground bars with ¼” minimum stainless steel hex head cap screws with stainless steel washers, lock washers and nuts.

2.07 Exothermic Welded Connections

- a. Exothermic Welded connections shall be Ultraweld by Harger.
 - I. Weld types BE shall be made to the ground bars using appropriate size weld metal.
 - II. Weld types VA, VD, or VU shall be made to structural steel framework.

Part 3 – EXECUTION

3.01 Installation

- a. The telecommunications main grounding bar (TMGB) is a dedicated extension of the building grounding electrode system for the telecommunications system. The TMGB should be located near the telecommunications service entrance and the electric service entrance.
 - I. The TMGB shall be connected to the main electric service entrance panel ground or the branch electric panel ground that serves the telecommunications equipment.



- II. The TMGB shall be located to minimize the length of the bonding conductor for telecommunications from the TMGB to the electric service ground.
 - III. The bonding conductor for telecommunications shall be at least the same size as the telecommunications backbone (TBB) conductor.
 - IV. The TMGB shall serve telecommunications equipment that is located in the same room or space.
 - V. Connections to the TMGB shall be made by exothermic welding or by listed two-hole compression lugs.
 - VI. All metal conduits or raceways for telecommunications cabling located within the same room or space as the TMGB shall be bonded to the TMGB.
 - a. Metal conduits 1" diameter and larger shall be bonded using Harger series CPC electro tin-plated pipe clamps.
 - b. Metal conduits less than 1" diameter shall be bonded using Harger TBGC4SCS electro tin-plated conduit bonding clamps.
 - c. Metal cable trays shall be bonded using Harger TBCTC electro tin-plated cable tray bonding clamps.
 - d. Bonding surface areas shall be cleaned to bare metal removing all paint, etc. The contact area shall be protected from corrosion using antioxidant joint compound. Harger series HCAJC for copper to copper connections or Harger series HAAJC for copper to aluminum or steel connections.
 - VII. Where an electric power panel for telecommunications equipment is located in the same room or space as the TMGB, the panel ground bus or panel enclosure shall be bonded to the TMGB.
 - VIII. The TMGB shall be located in an area that is accessible to telecommunications personnel
- b. The telecommunications backbone (TBB) is a conductor that originates at the TMGB and extends throughout the building interconnecting all telecommunications grounding busbars (TGBs) with the TMGB.
- I. The TBB shall be a copper conductor. The minimum size of the conductor shall be No. 6 AWG. The size of the conductor shall be increased 2 kcmil per linear foot as the length of the TBB increases. For example: A TBB 25 feet in length shall be No. 2 AWG (66,360 cmil). A TBB 100 feet in length shall be No. 4/0 AWG (211,600 cmil)
 - II. The TBB conductors should be installed without splices. Where splices are necessary, the number of splices should be minimized and located in accessible telecommunications spaces. Splices shall be made using exothermic welding, listed irreversible compression connectors or equivalent.
 - III. The building water piping system shall not be used as a TBB.
 - IV. Metallic cable shields or metallic conduits shall not be used as a TBB.



- c. A telecommunications grounding busbar (TGB) shall be provided in each area where telecommunication equipment is located. The TGB is the grounding connection point for telecommunications systems and equipment in each separate area.
 - I. The TGBs shall be connected to the TMGB via the TBB conductor.
 - II. The TBB and other TGBs within the same area shall be bonded to the TGB with a conductor the same size as the TBB.
 - III. The bonding conductor between the TBB and the TGB shall be continuous and routed in the shortest straight-line path possible.
 - IV. Connections to the TGB shall be made by exothermic welding or by listed two-hole compression lugs.
 - V. All metal conduits or raceways for telecommunications cabling located within the same room or space as the TGB shall be bonded to the TGB.
 - VI. Where an electric power panel for telecommunications equipment is located in the same room or space as the TGB, the panel ground bus or panel enclosure shall be bonded to the TGB.
- d. Where there are multiple telecommunications rooms or spaces with multiple TBBs, the TBBs shall be interconnected with a Grounding Equalizer (GE) conductor at the TGBs.
 - I. The GE shall be sized as specified for the TBB.
 - II. Connections of the GE to the TGBs shall be made by exothermic welding or by listed two-hole compression lugs.
- e. In structural steel frame buildings, where the steel framework is accessible within the room; the TMGB and each TGB shall be bonded to the structural steel frame using a minimum No. 6 AWG conductor.
 - I. Connections to the structural steel frame shall be made by exothermic welding or by Harger No. 217 or Harger No. 223T electro tin-plated bronze bonding plates. The area of contact on the steel frame shall be cleaned to bare metal removing all paint and mill scale. The contact area shall be protected from corrosion using Harger series HAAJC antioxidant joint compound.
 - II. Where the structural steel frame is external to the room and is accessible, the structural steel should be bonded to the TGB or the TMGB using a minimum No. 6 AWG conductor.

END OF SECTION 27 05 26