

PART 1 - GENERAL

This section of the Telecommunications Construction Guide Specification has references, products, procedures, processes, and work descriptions/summaries that are common to many Washington State University Pullman (WSUP) campus telecommunications projects. This information is provided in specification format to serve as a guide to the Designer in producing a CSI-compliant specification that will meet the unique requirements of WSUP Telecommunications projects. However, this document is not intended to be a Master Specification. The information included in this section is not intended to be all-inclusive for any given project.

The Designer shall edit this section (adding and/or removing content where required) to meet the requirements of a given project.

Prior to publishing the specifications for bid or construction purposes, all edits shall be made using the MS Word Tracking Changes feature. **When submitting the specifications for review at each progress milestone, print the specifications showing the revision markings.**

Text in shaded boxes (such as this text) is included to aid the Designer in understanding areas of this section that may require modification for a particular circumstance. Although this text is generally written in declarative form, the Designer shall consider it guidance only. The Designer shall not assume that the content of this specification section is suitable or sufficient for any given project in its current form, and shall remain responsible for developing a thorough and complete specification that meets the requirements of the project being designed.

1.1 SUMMARY

- A. Provide all materials and labor for the installation of a grounding and bonding system for inside plant telecommunications infrastructure. This section includes requirements for providing a permanent grounding and bonding infrastructure for horizontal and backbone communications circuits, equipment racking, raceways, and cable tray. These requirements are in addition to any that may exist in Section 26 – “Grounding.”

Review and edit the following list of definitions for applicability to this project. Add and/or remove definitions for unusual terms that are not explained in the conditions of the Contract and that are used in ways not common to standard references.

NOTE: Furnish, provide and install are used repeatedly throughout this specification. The Designer shall ensure that these terms are identified in the appropriate section of the project manual. The definitions of these terms shall be similar to the following:

Furnish - “Supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations”.

Install - “Operations at the project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations”.

Provide - “To furnish and install, complete and ready for the intended operation”.

1.2 SYSTEM DESCRIPTION

Review and edit the following statement(s) for applicability to this project, restricted to describing performance, design requirements and functional tolerances of a complete system.

- A. Furnish, install, and place into satisfactory and successful operation all materials, devices, and necessary appurtenances to provide a complete, permanent Grounding and Bonding infrastructure for communications circuits, raceways, and cable trays as hereinafter specified and/or shown on the Contract Documents. The Grounding and Bonding system shall support an ANSI/TIA/EIA and ISO/IEC compliant communications Structured Cabling System (SCS) as specified in Section 27 11 00 – “Communications Equipment Room Fittings” and Section 33 82 00 – “Communications Distribution.”
- B. The work shall include materials, equipment and apparatus not specifically mentioned herein or noted on the plans but which are necessary to make a complete working ANSI/TIA/EIA and ISO/IEC compliant Grounding and Bonding system.

Include any requirements for coordinating work with potentially unusual or specifically required sequencing. WSUP may choose to construct a project under two bid packages - one for pathways and spaces (perhaps under a General Contract), and a second bid package for the Structured Cabling System (perhaps using the WA State DIS Master Contract). The Designer must coordinate with WSUP to determine if two bid packages will be used and include verbiage in the appropriate specification sections requiring the contractors to coordinate construction phasing and schedules.
Part 2 - Products

PART 2 - PRODUCTS

Ensure that products listed under the PART 2 – Products paragraphs have corresponding installation instructions in PART 3 – Execution, or in another specification section if furnished but not installed under this section.

WSUP has standardized on certain manufacturers and certain products for all new Structured Cabling Systems in WSUP facilities. Products shall be specified accordingly. The Designer shall ensure that the latest part numbers are used for specified products. Any substitutions require WSUP pre-approval before specification.

If the Designer wishes to use products that deviate from WSUP standards, a Standards Variance Request shall be made, as described in the Technology Infrastructure Design Guide (TIDG). If the alternative product is approved, the Designer shall adapt this to reflect the approved changes.

The products listed throughout Part 2 - Products below are not all-inclusive for any given project. The Designer shall ensure that all required products are specified. The Designer shall also verify that the most current part number of each specified product is listed in this section.

2.1 GENERAL

- A. Materials shall consist of busbars, supports, bonding conductors and other incidentals and accessories as required.

2.2 GROUNDING/BONDING:

- A. Telecommunications Main Grounding Bus Bar (TMGB):
 - 1. Large (20" x 4" x 1/4"), Pre-drilled: CPI 10622-020 or Panduit GB2B0312TPI-1
 - 2. Small (10" x 4" x 1/4"), Pre-drilled: CPI 10622-010
- B. Telecommunications Grounding Bus Bar (TGB):
 - 1. Large (20" x 4" x 1/4"), Pre-drilled: CPI 10622-020 or Panduit GB2B0312TPI-1
 - 2. Small (10" x 4" x 1/4"), Pre-drilled: CPI 10622-010

- 3. Narrow (13" x 2" x ¼"), Pre-drilled: Erico ERITECH TGB-A12L06PT (for wireless access point application)
 - C. Telecommunications Bonding Backbone (TBB): #2 AWG or #250 kcmil insulated (green in color) copper conductor.
 - D. Grounding Conductor: #6 AWG insulated (green in color) copper conductor.
 - E. Grounding Conductor: #6 AWG bare copper conductor.
- 2.3 LABELS:
- A. As recommended in ANSI/TIA/EIA 606. Permanent (i.e. not subject to fading or erasure), permanently affixed, and created by a hand-carried label maker or a computer/software-based label making system. Handwritten labels are not acceptable.
 - 1. Labels:
 - a. Panduit Marker Tie (or approved equal)
 - b. Brady: Bradymaker Wire Marking Labels WML-511-292 (or approved equal)
 - 2. Hand-carried label maker:
 - a. Brady: ID Pro Plus (or approved equal).

PART 3 - EXECUTION

Ensure that products incorporated into the project under PART 3 paragraphs have corresponding Product information in PART 2 – Products, or in another specification Section if installed but not supplied under this Section.

The following paragraphs include installation requirements written specifically for the Products listed in Part 2 above. If other products are approved, the Designer shall ensure that appropriate Part 3 installation requirements are added/removed or modified as applicable and described in equal or greater detail to the following paragraphs.

All installation requirements shall be consistent with the manufacturer's requirements.

3.1 GENERAL

- A. Install the grounding and bonding system in a manner ensuring that communications circuits, when installed, are able to fully comply with the ANSI/TIA/EIA standards.

3.2 INSTALLATION

Review and edit the following installation requirements based on the products specified in PART 2 – Products above or on the products specified in another section if installed but not supplied under this section, and as applicable to this project.

- A. The grounding and bonding infrastructure system shall not make use of the building plumbing system, unless required to do so by the NEC.
 - 1. Coordinate the installation of the grounding and bonding system with the electrical power distribution system grounding infrastructure.

3.3 GROUND/BONDING:

- A. TMGB: Provide a minimum of one TMGB per main telecommunications room (“MDF”) for each building and as shown on the Contract Documents. Install TMGB(s) and directly bond TMGB(s) to electrical service ground and to associated TBB(s). Group protector, busbar bonding, and approved building

grounding conductors toward the left end and leave space for equipment grounding conductors to the right end.

- B. TGB: Provide TGB as shown on the Contract Documents and as required. Directly bond each TGB to its associated TBB (and thence to the TMGB) and to the nearest building structural steel or other permanent metallic system. Group protector, busbar bonding, and approved building grounding conductors toward the left end and leave space for equipment grounding conductors to the right end.
- C. TBB(s): Provide TBB(s) as shown on the Contract Documents and as required to bond TMGB to building main electrical ground and to bond all TGBs to the TMGB.
 - 1. Route along the shortest and straightest path possible with minimal bends.
 - 2. Bends shall be sweeping.
 - 3. Insulate TBB(s) and conductors from their support.
 - 4. TBB(s) shall be continuous (without splices).
- D. Grounding Conductors: Provide grounding conductors as shown on the Contract Documents and as required to bond all non-current carrying metal telecommunications equipment and materials to the nearest TGB.
 - 1. Route along the shortest and straightest path possible with minimal bends.
 - 2. Bends shall be sweeping.
 - 3. Insulate grounding conductors from their support.
 - 4. Grounding conductors shall be continuous (without splices).
 - 5. Bare conductors shall be provided for cable trays, wire mesh trays and wire gutter.
 - 6. Insulated conductors shall be provided in telecommunications rooms.
 - 7. Ensure that bonding breaks through paint to bare metallic surface of all painted metallic hardware.
- E. Special Applications:
 - 1. Exterior Wireless Access Point Panels: Provide a Narrow grounding bus bar as shown on the Contract Documents. Install busbars and bond bus bars to associated TBB(s).

3.4 LABELS:

- A. Label TMGB(s) with "TMGB". If the TMGBs are existing and unlabeled, provide labels for each.
- B. Label TGB(s) with "TGB". If the TGBs are existing and unlabeled, provide labels for each.
- C. Label TBB(s) and bonding conductors "WARNING! TELECOMMUNICATIONS BONDING CONDUCTOR. DO NOT REMOVE OR DISCONNECT!"

END OF SECTION