

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

Review and edit the following list of generic type products for relevance to this project. This listing should not include procedures or processes, preparatory work, or final cleaning.

- A. Provide all materials and labor for the installation of telecommunications cabinets, racks, frames, enclosures, cable management, and power hardware. This section includes hardware that supports the specified Structured Cabling System (SCS - See Definition Below).

Include this paragraph only if products will be furnished but not installed under this section (perhaps installed under other sections or by the Owner). When installations are "By Owner" consider referencing the installation to Division 1 Section 01010 (or equivalent) - Summary of Work (Owner- Installed Items). If this paragraph is required for the project, the Designer must take care to clearly define any product warranty issues associated with the split responsibility.

- B. Products installed (but not furnished) under this section:
1. Grounding Conductor

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, test and place into satisfactory and successful operation all equipment, materials, devices, and necessary appurtenances associated with telecommunications cabinets, racks, frames, enclosures, cable management, and power hardware to support an ANSI/TIA/EIA, NECA/NEIS and ISO/IEC compliant communications Structured Cabling System (SCS) as shown on the Contract Documents.

- B. The work shall include all 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 SCS.

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. Racks, rack cable distribution hardware, ladder rack, and other rack and distribution components shall be manufactured by a single manufacturer unless stated otherwise in this Specification or in the Contract Documents. Do not intermix equipment and components between different manufacturers.
 - 1. Rack/Distribution Equipment: Chatsworth Products, Inc. (CPI)

2.2 CABLE SUPPORTS

For new construction and full remodel projects, the Designer shall coordinate with the Architect to incorporate the following backboard-related requirements into the architectural specifications for wall treatments and painting. After verifying that the backboard requirements are adequately covered in the architectural specifications, the following paragraph can be deleted.

- A. Backboards:
 - 1. ¾ inch A-C non-fire-retardant plywood backboards, void free, 2440-mm (8-ft) high unless otherwise noted. ¾ inch A-C fire-retardant plywood backboards, void free, 2440-mm (8-ft) high unless otherwise noted.
 - 2. Primer
 - 3. White-colored satin (washable) paint
- B. Cable Supports:
 - 1. D-Rings:
 - a. Metallic: CPI 10941, 10942, 10943
 - 2. Saddle-backs
 - 3. Cable Clamps
- C. Ladder Rack: Complete with fittings including (but not limited to) splice kits, cable radius drop, radius bends, protective end caps, retaining posts, support brackets, foot kits, vertical wall brackets, wall

angles, grounding hardware and other incidental and miscellaneous hardware required for a complete ladder rack system. Ladder rack components shall be manufactured by the selected Rack/Distribution Equipment manufacturer.

1. Unless otherwise indicated, all ladder rack and incidental equipment color shall be:
 - a. In Telecommunications Rooms: Black
 - b. In other rooms: see Section 27 05 36 – “Cable Trays for Communications Systems”.
2. Ladder rack, Cable Runway, 12 inch wide minimum:
 - a. Homaco: TR10-12B
3. Ladder rack protective end caps:
 - a. Homaco: 2-E1-25C-A
4. Vertical Wall Bracket:
 - a. Homaco: P982078B
5. Cable Retaining Posts:
 - a. Homaco
6. Wall Angle Assemblies:
 - a. Homaco: P128240B
7. Triangle Support Wall Bracket for Cable runway:
 - a. Homaco: P139x40H
8. Radius Drops:
 - a. Homaco: TRP8-CM
9. Equipment Rack Junction Plate:
 - a. Homaco: JPxxxx
10. Equipment Rack Guard Rail:
 - a. Homaco: GR-19
11. Cable Fence, 6 inch:
 - a. Homaco: CF-6
12. Ladder rack/cable runway Grounding kits:
 - a. Homaco

2.3 EQUIPMENT RACKS/ENCLOSURES

- A. Unless otherwise indicated, equipment racks/enclosures and incidental equipment color shall be:
 1. Black
- B. Unless otherwise indicated, equipment rack/enclosure/wall-mounted brackets and incidental materials and equipment shall be provided by the selected Rack/Distribution Equipment manufacturer. Do not intermix products from different manufacturers.
- C. Free Standing Equipment Racks: EIA-standard 7-foot high x 19-inch wide racks (black), with universal alternating-hole pattern (marked with rack-unit spacing), complete with top angles, self-supporting bases, and mounting holes on both sides of the rails.
 1. Racks:
 - a. CPI: Standard Rack 55053-703
 2. Guard rail: 7 inch deep:
 - a. CPI: 40056-719
 3. Vertical cable management:
 - a. 6 inch wide: Panduit WMPVHC45E
- D. Single sided low profile equipment shelf:
 1. CPI: 40074-700
- E. Lockable storage drawer:
 - a. CPI: 11505-719

- F. Grounding kit and #6 AWG insulated copper conductor grounded to the nearest TGB.
 - 1. CPI: CPI grounding kit
 - 2. B-Line: B-Line grounding kit

- G. Incidental materials required for proper construction, mounting and securing.

2.4 GROUNDING AND BONDING

- A. As specified under Section 27 05 26 – “Grounding and Bonding for Communications Systems.”

2.5 LABELING AND ADMINISTRATION

- A. Labels:
 - 1. 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.
 - a. Station Cable:
 - 1) Brady: Bradymaker Wire Marking Labels WML-511-292 (or approved equal)
 - b. Backbone Cable:
 - 1) Panduit Marker Tie (or approved equal)
- B. Hand-carried label maker:
 - 1. Brady: ID Pro Plus (or approved equal).

PART 3 - EXECUTION

3.1 GENERAL

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. All plumbing, drains, piping, unrelated HVAC ductwork, and other utilities that are not related to telecommunications shall be routed around telecommunications rooms. Only utilities that serve telecommunications rooms shall enter telecommunications rooms.

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.

3.2 CABLE SUPPORTS

For new construction and full remodel projects, the Designer shall coordinate with the Architect to incorporate the following backboard-related requirements into the architectural specifications for wall treatments and painting. After verifying that the backboard requirements are adequately covered in the architectural specifications, the following paragraph can be deleted.

- A. Backboards: Provide backboards as shown on Contract Documents. Backboards shall be capable of supporting attached equipment.
1. Mount A-C plywood backboards with the "A" side exposed, with flush or countersunk fasteners, and with the joints butted tight.
 2. Mount backboards 9 inches above finished floor, such that the top of the backboard reaches 8 feet 9 inches above finished floor, unless otherwise indicated.
 3. Paint backboards with a minimum of two coats (over primer) of white colored satin paint.

WSUP prefers to minimize the use of D-Rings. The Designer shall seek case-by-case approval from the ITPM to use D-Rings. Delete the paragraph below if D-Rings are not required/approved for a project.

- B. D-Rings: Provide D-Rings as necessary to route exposed backbone cables in telecommunications rooms and on backboards and for raceway for routing cable in non-exposed open access environments, and as shown in the Contract Documents. D-Rings may be affixed to wall/ceiling structures or other supports, but not attached to a ceiling support system. In telecommunications rooms, mount D-Rings at 12 inch intervals and as shown in the Contract Documents.
1. Size D-Rings as noted in the Contract Documents.
 2. Where not noted, size D-Rings according to the type and quantity of cable to be routed through the ring per TIA/EIA 569 cable capacity standards, plus an additional 100% for future expansion, but not less than a minimum of 2 inches in diameter.
 3. D-Rings are not permitted outside of telecommunications rooms unless otherwise indicated in the Contract Documents.
 4. Horizontal cables shall be routed via overhead and vertical ladder racking (not via D-Rings).
- C. Ladder Rack: Provide ladder racking, sized and in locations as shown on the Contract Documents, installed per manufacturer's instructions with flat (rung) side up. Install ladder rack affixed to top of equipment racks at 7 feet 0 inches above finished floor (unless otherwise indicated) to serve as equipment rack bracing.
1. Cut ends of ladder rack square. Ream cut ends to remove burrs and sharp edges. Cap cut ends with manufacturer's recommended caps.
 2. Provide 90-degree horizontal radius bends for each 90-degree change in direction of ladder rack angle.
 3. Provide cable runway grounding kits across ladder rack splices and where ladder racks are connected to equipment racks/cabinets.
 4. Provide cable retaining posts at 2 foot intervals and at each corner and junction as follows:
 - a. The inside of ladder rack (away from wall), where rack is mounted adjacent to a wall.
 - b. Both sides of ladder rack where rack is not mounted adjacent to a wall.
- D. Vertical Ladder Rack: Provide vertically mounted ladder racking attached to walls, anywhere in telecommunications rooms where cabling changes elevation by 24 inches or greater, and also in locations shown on the Contract Documents. Size vertical ladder racking as shown on Contract Documents, 12 inches wide minimum.

3.3 EQUIPMENT RACKS/ENCLOSURES

See the WSUP Telecommunications Distribution Design Guide for information on required drawing content, including telecommunications room Plan Views discussed below. Verify with WSUP ITPM whether vented shelves are to be provided for Owner 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. Provide EIA racks/cabinets and all associated hardware according to locations, elevations, and plan views as shown in the Contract Documents.
- B. Floor Mount Racks/Cabinets:
 - 1. Using ladder rack, horizontally affix the top of a given rack/cabinet to the wall as shown on the Contract Documents. Bolt horizontal ladder rack to rack/cabinet and to walls. Bolt rack/cabinet to floor.
- C. Free Standing Equipment Racks:
 - 1. Provide guard rails near the base of each rack, both in the front and rear.
 - 2. Coordinate with Owner to identify desired location for shelf. Provide shelf, installed per Owner's direction.
 - 3. Coordinate with Owner to identify desired location for lockable storage drawer. Provide drawer, installed per Owner's direction.
- D. All rack accessories and screws provided with the racks but not installed shall be bagged and left with the rack upon completion for Owner's future use.

3.4 GROUNDING AND BONDING

- A. Grounding and bonding work shall comply with the Uniform Building Code, Uniform Fire Code, WAC, National Electrical Code, and UL 467, ANSI/TIA/EIA standards and the references listed in Section 27 05 00 – "Common Works Results for Communications" PART 1 – STANDARDS AND CODES, as well as local codes which may specify additional grounding and/or bonding requirements.
 - 1. Provide a minimum of one wall-mountable telecommunications ground bus bar per telecommunications room and as shown on the Contract Documents.
 - 2. Grounding conductor shall be installed to bond all non-current carrying metal telecommunications equipment and materials to the nearest TMGB or TGB (as provided under Section 27 05 26 — "Grounding and Bonding for Communications Systems").
 - a. Ensure that bonding breaks through paint to bare metallic surface of all painted metallic hardware.
 - b. Provide ladder rack grounding kits to bond each section of ladder rack and bond ladder rack to racks/cabinets where ladder racks are connected.

3.5 LABELING AND ADMINISTRATION

- A. Telecommunications Rooms: Affix a permanent label with the telecommunications room number on the wall above the light switch inside each telecommunications room. Where telecommunications room names are required in other labels, use the telecommunication room name shown on the Contract Documents.
- B. Racks: Label racks as shown on the Contract Documents. Affix label centered across top cross-member of rack and on the foot-plate. Labels shall read "Rack 1", "Rack 2", "Rack 3", etc. as shown on the Contract Documents.

END OF SECTION