

SECTION 27 11 19

COMMUNICATIONS TERMINATION EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes requirements for equipment to terminate communications cable in communications equipment rooms and spaces. General requirements for termination equipment are covered in Division 27 Specification Section *Communications - General Requirements*.

1.02 RELATED SECTIONS

- A. The requirements of Division 27 Specification Section *Communications - General Requirements* shall serve as the basis for the requirements of this Section, and are incorporated by reference into this Section.

1.03 SUBMITTALS

- A. Comply with the Submittal portion of Division 27 Specification Section *Basic Communications Requirements*. Provide submittal information for the following:
 - 1. Product Data

PART 2 - MATERIALS

2.01 GENERAL

- A. Manufacturer: Unless otherwise indicated, equipment in this Section shall be of the same Manufacturer as that specified under Division 27 Specification Section *Communications - General Requirements*.
- B. Part Numbers: Refer to the Equipment Schedule(s) for specific manufacturers and part numbers. If no part number is provided, then any part meeting the manufacturer and requirements specified is acceptable.

2.02 PATCH PANELS

- A. Provide patch panels in sizes and quantities as required to support all cables to be terminated. The sizes and quantities shown on the Drawings are for representative purposes only, and may or may not be the final sizes and quantities required. The Contractor shall provide sizes and quantities as required to support all cables to be terminated.
 - 1. Copper: Copper patch panels shall be rack mountable and sized as shown on the Drawings. Patch panel connectors shall be 8-position/8-conductor, insulation displacement (IDC), non-keyed, and shall accept modular 8-position/8-conductor plugs. Patch panels shall support a universal T568B) wiring pattern, shall meet or exceed the transmission requirements for connecting hardware as specified in the Division 27 Specification Section *Communications - General Requirements* for the Category for which they are rated, shall be equipped with pre-manufactured cable management support bar/strain relief for supporting cables behind the patch panel, and shall be complete with all incidental materials necessary for mounting and installation of the panel and support of the cables which shall be connected to it. Patch panels shall be available in 48-port styles.
 - a. Horizontal Copper Patch Panels: Provide for terminating copper horizontal cables. Patch panel Category rating shall be the same as that specified under Division 27 Specification Section *Communications - General Requirements*.
 - b. Voice-Grade Copper Backbone Patch Panels: Provide for termination of high pair count voice-grade Category 3 rated copper backbone cables. Patch Panel shall be Category 3 rated or higher.
 - c. Tie Distribution Copper Patch Panels: Provide for termination of 25-pair count voice-grade Category 3 rated copper tie cables. Patch Panel shall be Category 3 rated or higher.
 - d. Data-Grade Copper Backbone Patch Panels: Provide for termination of data-grade 4-pair cable used for connectivity between communications rooms. Patch panel Category rating

shall be the same as that specified under Division 27 Specification Section *Communications - General Requirements*.

2. Fiber: Fiber patch panels shall be dual purpose, capable of both termination/connectorization and splicing (fusion or mechanical) of fiber in the same enclosure, shall support both regular and high-density connectors, and shall be sized as shown on the Drawings. Fiber patch panels shall consist of enclosures pre-assembled with connector panels, blank connector panels (for unused connector slots), strain relief, splice trays (as required) and splice incidentals. Fiber patch panels shall be complete with bulkheads as required to accommodate all fiber strands within the panel, and filler plates as required for all unused bulkhead slots (see Division 27 Specification Section *Communications - Faceplates and Connectors*), and with all incidental materials necessary for mounting.
 - a. Rack Mount: Rack Mount Patch Panels shall be 19 inches wide and shall be available in 24/48 (1U), 48/96 (2U), and 72/144 (4U) port sizes.
 - b. All optical fiber cables shall terminate in Panduit FRME optical fiber enclosures.

2.03 COPPER TERMINATION BLOCKS

- A. 66M1-50 Style:
 1. Termination blocks:
 - a. Provide designation strips for each 66M1-50 style termination block, with bridge clips as required. Termination blocks shall be provided with or without 89-brackets as required by the mounting application. Designation strips shall mount on fanning strips of 66M1-50 block, provide a labeling surface for circuit identification, and be manufactured by the manufacturer of the 66M1-50 block. Termination blocks shall be UL listed. Termination blocks shall be provided in the quantities required for complete termination. Provide as shown on the Drawings or as required.
 - 1) For copper backbone and tie cable connectivity: Termination blocks shall be Category 3 rated or higher.
 - 2) For horizontal cable connectivity: Termination block Category rating shall be the same as that specified under Division 27 Specification Section *Communications - General Requirements*.
 2. Mounting Equipment (for termination blocks to be mounted on racks or wall frames):
 - a. Wall Mounting Termination Block Frame: Provide wall mountable cable management frames to mount termination blocks on walls. Cable management frames shall consist of a wall mountable universal unit with separate horizontal and vertical pathways.

2.04 OTHER TERMINATION EQUIPMENT

- A. Building Entrance Protectors: Provide Building Entrance Protectors (BEP's) for the protection all building-to-building copper cables. Each BEP shall be provided complete with plug-in protector modules. Protector modules shall provide over-voltage and sneak current protection and shall be 4B series. For tail-in/tail-out style protectors, provide tail-in and tail-out lengths as required by the application. Provide in sizes and quantities as shown on the Drawings.
- B. Splice Enclosures: Provide as shown on the Drawings and as required by Cable Spool length limitations.
 1. Copper Splice Enclosures: Splice enclosures shall be sized to accommodate the quantity of pairs to be spliced. Enclosures shall be re-enterable without the destruction of the housing. Enclosures shall be complete with all incidental and required hardware including, but not limited to, cans, end caps, grommet kits, covers, splice connectors, and grounding/bonding hardware. Enclosures shall be either butt or in-line depending upon the application and shall not require special tooling for entry and sealing of the enclosure. Only allowed when going from outside to inside.
 - a. Outdoors: Provide re-enterable encapsulant for all outdoor splice enclosures. The enclosure shall be encapsulated with a manufacturer recommended water blocking compound.

- b. Copper Splice Connectors: Splice connectors shall be RUS Listed and shall be either straight or bridge depending upon the application. Connectors shall be <3M 710> or <3M MS²>.
2. Fiber Splice Enclosures: Provide outdoor rated (buried or underground type, depending upon the application) fiber splice enclosures as shown on the Drawings. Enclosures shall be sized to accommodate the quantity of fiber to be spliced with spare capacity to support a minimum of xxx additional splices in the future. Enclosures shall be re-enterable without the destruction of the housing. Enclosures shall not require special tooling for entry and sealing of the enclosure. Enclosures shall be complete with all incidental and required hardware including, but not limited to end caps, grommet kits, splice trays and grounding/bonding hardware. Enclosures shall be either butt or in-line depending upon the application.

PART 3 - EXECUTION

3.01 GENERAL

- A. Work shall comply with the Governing Requirements as defined in Division 27 Specification Section *Basic Communications Requirements*. Governing Requirements of particular relevance to this Section include, but are not limited to:
 1. TIA/EIA - 568: Commercial Building Telecommunications Cabling Standard
 2. TIA/EIA 569: Commercial Building Standard for Telecommunication Pathways and Spaces
 3. ANSI/EIA 310-D: Cabinets, Racks, Panels and Associated Equipment
 4. TIA/EIA 606-A: The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 5. ANSI/NECA/BICSI 607: Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings
 6. ANSI J-STD-607: Commercial Building Grounding and Bonding Requirements for Telecommunications
 7. TIA/EIA - 758: Customer-owned Outside Plant Telecommunications Cabling Standard

3.02 PATCH PANELS

- A. Copper:
 1. Horizontal Patch Panels: Cables shall be terminated sequentially and alphabetically by room number and sequential outlet number (within a room) left to right. Use the T568B wiring pattern.
 2. Voice-Grade Copper Backbone Patch Panels: Cable pairs shall be terminated x-pair(s) per port sequentially in accordance with the United States color code.
 3. Data-Grade Copper Backbone Patch Panels: Cable(s) shall be terminated sequentially with the lowest numbered cable on the top left port when facing the front of the patch panel.
 4. All patch panels shall be standard density (48 ports per 2 RU), angle or match existing modular-jack style and designed to accommodate Panduit TG-style 8 position modular jacks.
 5. No patch panel should be installed below row 22 without explicit instruction from DPS DoTS.
 6. Smaller installations or ones with limited floor space may use wall mount distribution racks. In these instances the project documentation will so indicate and the DoTS PM will make this determination.
 7. Multi-pair backbones shall be terminated on rack mounted 24 port angle or match existing modular panels or hardware selected to match legacy hardware for that location.
- B. Fiber:
 1. Fiber Patch Panels: Strands shall be connected sequentially left to right and from top to bottom. Terminate singlemode fibers in first available ports and multimode in last available ports.

3.03 COPPER TERMINATION BLOCKS

- A. Terminate cable sequentially across the termination strips. Punch down cable using only the Manufacturer approved impact tool. Only used in B-Line lockable cabinet.
- B. Backbone Termination Blocks: Cables shall be terminated by the United States Color Code and sequentially left to right and from top to bottom.
- C. Backbone Termination Blocks:
 - 1. Cables shall be terminated by the United States Color Code and sequentially top to bottom and from left to right.
 - 2. Copper riser cables shall be routed so as to feed into termination blocks from the bottom.
- D. Tie Termination Blocks: Cables shall be terminated by the United States Color Code and sequentially top to bottom and from left to right.

3.04 OTHER TERMINATION EQUIPMENT

- A. Building Entrance Protectors (BEP's): Install BEP's for both ends of outside plant copper cables per manufacturer's instructions. All outside plant copper cables shall be routed through BEP's. Connect each BEP's protector ground lug to the nearest TGB with #6 AWG copper grounding conductor.
- B. Wall Mount Termination Block Distribution Rings: Unless otherwise shown on Drawings, install Distribution Rings above 66-blocks to create a jumper wire channel.
- C. Splice Enclosures:
 - 1. Copper:
 - a. Testing: Copper splices shall be electrically tested for opens, shorts, crosses and grounds, prior to sealing the enclosure.
 - b. Outdoors:
 - 1) Install where shown on the Drawings and where required due to Cable Spool length limitations. If, in the Contractor's opinion, additional enclosures will be required, the Contractor shall obtain the approval of the Engineer prior to installation.
 - 2) Direct-bury or enclosures located in ducts are not permitted unless approved by the Engineer prior to installation.
 - 3) Racking: Splice enclosures located in underground cable vaults/manholes shall be supported on racks (at both ends) and shall be routed to avoid blocking duct access.
 - 4) Sealing: Splice enclosures shall be properly sealed and demonstrated watertight. Install encapsulant per manufacturer's instructions. Test seals after closure by pressurizing the enclosure and checking seals for leaks.
 - 2. Fiber: Install all required splice trays, splice organizers, grommet and grip kits, closure kits, etc.
 - a. Indoors:
 - 1) Install as shown on the Drawings. Install all required hardware and kits for field fusion splicing in splice closure and for sealing and mounting the closures.
 - 2) Grounding/Bonding: If non-dielectric cable, connect to the nearest TGB with #6 AWG copper grounding conductor.
 - b. Outdoors:
 - 1) Install where shown on the Drawings and where required due to Cable Spool length limitations. If, in the Contractor's opinion, additional enclosures will be required, the Contractor shall obtain the approval of the Engineer prior to installation.

- 2) Direct-bury or enclosures located in ducts are not permitted unless approved by the Engineer prior to installation.
- 3) Racking: Splice enclosures located in underground cable vaults/manholes shall be supported on racks (at both ends) and shall be routed to avoid blocking duct access.

PART 4 - EQUIPMENT SCHEDULE

4.01

27 11 19 - TERMINATION EQUIPMENT (TE)		
DESCRIPTION	"PanGen"	Special Rqmt/Notes
HORIZONTAL COPPER PATCH PANEL-CAT 6 (24 PORT, 1U, MODULAR)	CPPLA24WBLY	
HORIZONTAL COPPER PATCH PANEL-CAT 6 (48 PORT, 2U, MODULAR)	CPPLA48WBLY	
RACK MOUNT FIBER PATCH PANEL (24/48 PORT, 1U)	FRME1U	
RACK MOUNT FIBER PATCH PANEL (48/96 PORT, 2U)	FRME2U	
WALL MOUNT FIBER ENCLOSURE	FWME4	
SC FIBER MULTIMODE ADAPTER PANELS	FAP6WAQDSC	
SC FIBER SINGLE MODE ADAPTER PANELS	FAP6WBUDSCZ	
LC FIBER MULTIMODE ADAPTER PANELS	FAP6WAQDLC	
LC FIBER SINGLE MODE ADAPTER PANELS	FAP6WBUDLCZ	
BLANK FIBER ADAPTER	FAPB	

END OF SECTION 27 11 19