

SECTION 27 11 00

COMMS EQUIPMENT ROOM FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provide labor, materials, and equipment for the complete installation of work called for in the Contract Documents.
2. Minimum requirements for equipment and cable installations in telecommunications equipment room (TEC), Telecommunications Distribution Room (TDR's) and entrance facilities.
3. Minimum composition requirements and installation methods for the following:
 - a. Open frame racks.

1.2 SUBMITTALS

- A. Provide product data for the following:
- B. Manufacturer's data/cut sheets, product drawing/specifications and installation instructions for all products (submit with bid).
- C. Shop Drawings: For communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.
- D. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1.3 QUALITY ASSURANCE

- A. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the owner or owner representative.
- B. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed. Where "approved equal" is stated or a substitution is requested, equipment shall be equivalent in every way to that of the equipment specified. All substitutions are subject to the control and approval of the owner or the owner representative.
- C. Strictly adhere to all Building Industry Consulting Service International (BICSI), Electronic Industries Alliance (EIA) and Telecommunications Industry Association (TIA) recommended installation practices when installing communications/data cabling.

- D. Material and work specified herein shall comply with the applicable requirements of:
1. ANSI/TIA–568-C Generic Telecommunications Cabling for Customer Premises
 2. ANSI/TIA–569-C Telecommunications Pathways and Spaces
 3. ANSI/TIA– 606-B Administration Standard for Telecommunications Infrastructure
 4. ANSI/TIA-607-C Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
 5. NFPA 70 – National Electric Code, current edition
 6. BICSI – Telecommunications Distribution Methods Manual, current edition
 7. NEMA – VE-1 – Metal Cable Tray Systems, 2002
 8. NEMA – VE-2 – Metal Cable Tray Installation Guidelines, 2001
 9. Seismic criteria defined in Section 260548 “Vibration and Seismic Controls for Electrical Systems.”

PART 2 - PRODUCTS

2.1 ACCEPTABLE EQUIPMENT PART NUMBERS INDICATED ON DRAWINGS.

2.2 BACKBOARDS

- A. Backboards: Plywood, fire-retardant treated, painted white, 3/4 by 48 by 96 inches (19 by 1220 by 2440 mm). Comply with requirements in Division 06 Section "Rough Carpentry" for plywood backing panels
- B. Walls with plywood shall be covered with 3/4 inch x 4ft x 8ft, AC-grade, fire retardant treated plywood, with the Fire Retardant-Stamp.
- C. The “C” side shall face the studs (attached on top of finished walls) so that the “fire retardant” stamp is visible on the “A” side.
- D. Plywood shall be painted with two coats of white, fire-retardant, low VOC paint leaving the Fire Retardant-Stamp(s) exposed for inspectors. Contractor shall get written Owner approval for paint color.
- E. Cutouts for electrical switches and outlets shall be provided.
- F. Plywood shall be fastened with #12 flat-head sheet metal screws to metal studs, every 16 inches to 24 inches on center depending upon stud spacing.
- G. Plywood shall not be fastened with a nail gun or explosive-charge device.

2.3 LADDER CABLE TRAY

- A. Description:
1. Configuration: Two I-beam side rails with transverse rungs welded to side rails.
 2. Rung Spacing: 9 inches on center.
 3. Radius-Fitting Rung Spacing: 9 inches at center of tray's width.
 4. Minimum Cable-Bearing Surface for Rungs: 7/8-inch width with radius edges.
 5. No portion of the rungs shall protrude below the bottom plane of side rails.

6. Structural Performance of Each Rung: Capable of supporting a maximum cable load, with a safety factor of 1.5, plus a 200-lb concentrated load, when tested according to NEMA VE 1.
 7. Minimum Usable Load Depth: 6 inches.
 8. Width: indicated on Drawings.
 9. Class Designation: Comply with NEMA VE 1, Class 20C.
 10. Splicing Assemblies: Bolted type using serrated flange locknuts.
 11. Hardware and Fasteners: ASTM F 593 and ASTM F 594 stainless steel, Type 316.
 12. Splice Plate Capacity: Splices located within support span shall not diminish rated loading capacity of cable tray.
- B. Cable Tray (ladder type) shall be used in communications equipment rooms (i.e., IDF/MDF/MMR/POE Rooms) to transition cabling from conduit stub ups to overhead basket tray.
- C. Cable Tray shall be:
1. Constructed of 0.065" thick steel, and
 2. Utilize tubular stringers to support rungs.
 - a. Stringers shall be 1-1/2" high.
 - b. Rungs shall be welded to stringers and shall be spaced 9" on center.
 3. Cable tray width(s) shall be as shown on the project Drawings.
 4. Cable tray finish shall be BLACK.
- D. Provide Cable Tray Radius Drop
1. Color: Black
 2. One at every location where cabling is routed through the rungs or tray elevation changes by 6 inches or more.
 3. Refer to drawings for part numbers
- ## 2.4 THE PDU SYSTEM
- A. Acceptable equipment part numbers indicated on drawings.
- B. PDU must be Meters and meet the input voltage/ampereage/kilowatt requirements.
- C. Provide the PDU plugstrip system with all associated mounting brackets, color coding, locking clips and accessory locking power cords.
- D. Power Strips: Comply with UL 1363.
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 2. Rack mounting, with detachable flanges.
 3. Meter to display load measurements for Voltage, Phase, Amperage.
 4. LED indicator lights for power and protection status.
 5. Circuit Breaker and Thermal Fusing: Unit continues to supply power if protection is lost.
 6. 10-foot input cord.
 7. Rocker-type on-off switch illuminated when in on position.
 8. Surge Protection: UL 1449, Type 3.

- a. Maximum Surge Current, Line to Neutral: 72 kA
 - b. Protection modes shall be line to neutral, line to ground, and neutral to ground.
 - c. UL 1449 Voltage Protection Rating for line to neutral and line to ground shall be 120-200-240-volt.
9. *ACCEPTABLE EQUIPMENT PART NUMBERS INDICATED ON DRAWINGS.*

2.5 GROUNDING

- A. Comply with requirements in Section 27 05 26 “Grounding & Bonding of Comms” for grounding conductors and connectors.
- B. Telecommunications Main Bus Bar:
 1. Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
 2. Ground Bus Bar: Copper, minimum 1/4 inch thick by 4 inches wide with 9/32-inch holes spaced 1-1/8 inches apart.
 3. Stand-Off Insulators: Comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.
- C. Comply with TIA-607-C

2.6 LABELING

- A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

2.7 FIRESTOPPING

- A. Comply with requirements in Division 07 Section “Penetration Firestopping. “Comply with TIA/EIA-569-B, Annex A, “Firestopping.” And section 27 05 37 “Firestopping for Communications Systems”
- B. Comply with BICSI TDMM, “Firestopping Systems” Article.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NFPA-70.
- B. Provide appropriate clearance between rack rails and other cable management devices.
- C. MOCK-UP: Contractor must provide a complete mock-up for ownership approval. Mock-up must include rack, PDU and Low voltage cable installation with mock-servers to present to ownership representative for verification of server rail placement, PDU mounting details and cable management.

- D. Comply with BICSI's "Information Technology Systems Installation Methods Manual" for installation of equipment in communications equipment spaces.
- E. FREE STANDING RELAY RACKS
1. Assemble relay racks according to manufacturer's instructions. Verify that equipment mounting rails are sized properly for rack-mount equipment before attaching the rack to the floor.
 2. All racks must be attached to the floor in four places using appropriate floor mounting anchors.
 3. Racks shall be grounded to the TGB using appropriate hardware provided by the contractor. The ground will meet local code requirements and will be approved by the authority having jurisdiction (AHJ).
 4. In seismic areas, the rack should have additional bracing as required by building codes and the recommendations of a licensed structural engineer. Refer to construction details for requirements.
 5. Ladder rack shall not attach to the top of the racks.
 6. The equipment load should be evenly distributed and uniform on the rack. Place large and heavy equipment towards the bottom of the rack. Secure all equipment to the rack with equipment mounting screws. Refer to elevation plans for equipment locations within racks.
 7. Install and tighten high strength bolts to the snug tight condition, in conformance with AISC Specification for Structural Joints using ASTM A325 or A490 Bolts. If Tension Control Bolts or Load Indicator Bolts are used, bolts shall be installed following recommendations of manufacturer. Hardened steel, round, flat washer shall be used under each nut and bolts shall be tightened until wrench twists of spliced ends.
- F. FiberRunner
1. Coordinate the fiber routing system installation with all other work as necessary to properly interface installation of fiber routing pathway with cabinets, racks, etc. Sufficient space shall be provided in areas encompassing fiber routing system to allow future access for installing and maintaining cables
 2. All fiber routing channel shall be cut using a miter box and saw. Larger quantities shall be cut using a plastic cutting saw blade for clean, burr-free cuts. Recommended Carbide 80T or 100T; .090 thickness, .125" kerf.
 3. Install the fiber routing system in accordance with recognized industry practices per UL 2024A. This will ensure that the system complies with requirements of UL
 4. / ULC standard that pertain to Optical Fiber Cable Routing Assemblies for Riser.
 5. Fiber Routing channel and accessories shall be stored in original packaging and in clean dry area. Product shall be protected from weather and construction traffic until installation.

END OF SECTION 27 11 00