SECTION 27 11 00
COMMUNICATIONS EQUIPMENT ROOM FITTINGS

1.01 SUMMARY

A. Section Includes:
1. Telecommunications mounting elements.
2. Backboards.
3. Telecommunications service entrance pathways.
4. Grounding.

B. Related Sections:
1. Division 27 Section "Communications Backbone Cabling" for voice and data cabling associated with system panels and devices.
2. Division 27 Section "Communications Horizontal Cabling" for voice and data cabling associated with system panels and devices.

1.02 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.
1. Detail equipment assemblies, and location and size of each field connection.
2. Equipment racks and cabinets: Include workspace requirements and access for cable connections.
3. Grounding: Indicate location of grounding bus bar and its mounting detail.

C. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.
1. Layout Responsibility: Preparation of Shop Drawings shall be under the direct supervision of an RCDD.
2. Installation Supervision: Installation shall be under the direct supervision of a Registered Technician, who shall be present at all times when Work of this Section is performed at Project site.
3. Field Inspector: Currently registered by BICSI as an RCDD to perform the on-site inspection.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.

D. Grounding: Comply with ANSI-J-STD-607-A.

1.04 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install equipment frames and cable trays until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and work above ceilings is complete.

1.05 COORDINATION

A. Coordinate layout and installation of communications equipment with Owner's telecommunications and LAN equipment and service suppliers. Coordinate service entrance arrangement with local exchange carrier.
   1. Meet jointly with telecommunications and LAN equipment suppliers, local exchange carrier representatives, and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
   2. Record agreements reached in meetings and distribute them to other participants.
   3. Adjust arrangements and locations of distribution frames, cross-connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.

PART 2 - PRODUCTS

2.01 PATHWAYS

A. Cable Support: NRTL labeled. Cable support brackets shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Cable tie slots fasten cable ties to brackets.
   1. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.
   2. Support brackets with cable tie slots for fastening cable ties to brackets.
   3. Lacing bars, spools, J-hooks, and D-rings.
   4. Straps and other devices.

2.02 CABLE TRAYS

A. Manufacturers: Subject to compliance with requirements, provide cable trays manufactured by of one of the following:
   1. Cooper B-Line Systems, Inc.
   2. Chalfant Manufacturing Co.
   3. MP Husky Corp.

B. Conform to NEMA VE 1.

C. General: Except as otherwise indicated, provide metal cable trays, of types, classes and sizes indicated with splice hangers and all other necessary accessories. Provide cable trays with rounded edges and smooth surfaces in compliance with applicable standards, and with the following additional construction features.

D. Cable Trays, Fittings, and Accessories: Aluminum conforming to Aluminum Association alloy 6063-T6 for center rails and rungs. Provide fabricated parts made from Aluminum Association Alloy 5052. Provide zinc-plated steel hardware and fasteners in accordance with ASTM B633.

E. Provide cable trays constructed of a center rail 1.625 x 3.250 inches with minimum section properties of Sx = 0.701 in^3 and Ix = 1.174 in^4. Provide rungs that are a single continuous square tube 0.54 x 0.54 inches with radiused corners and minimum section properties of Sx = 0.019 in^3 and Ix = 0.005 in^4. Provide rungs that are mechanically connected to the center rail in at least two places, symmetrical about the center rail, with ends finished to protect installers and cables.

F. Rungs space: every 9 inches.

G. Straight sections: 10foot lengths.

H. Cable tray width: 12 inches.

I. Splice hangers must also be capable of acting as the support points for all-thread rod.

J. Cable tray loading depth: 4inches.

K. Protect splices and connectors from the edges of the center rail and act as a barrier to prevent the center rail from transmitting hazardous gases or smoke; install hardware vertically so as not to interfere with the cables in the cable fill area.

L. Loading Capacities: Comply with NEMA class designation 12C.

M. Protect steel hardware against corrosion by galvanizing conforming to ASTM B 633.

N. Fabricate cable tray products with rounded edges and smooth surfaces.

O. Fittings: Furnish tees, crosses, risers, elbows, and other fittings as indicated, manufactured with the same materials and finishes as the cable trays.

P. Barrier Strips: Same materials and finishes as cable trays.

Q. Cable tray supports and connectors, including bonding jumpers, as recommended by cable tray manufacturer.

2.03 BACKBOARDS

A. Backboards: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches. Comply with requirements for plywood backing panels specified in Section 06 10 00 "Rough Carpentry." Refer to Drawings E4.01 and E4.02 for backboard including details and sizes.

2.04 EQUIPMENT FRAMES (RACKS)

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Cooper B-Line, Inc.

2. Hubbell Premise Wiring.
3. Leviton Voice & Data Division.
4. Middle Atlantic Products, Inc.
5. Ortronics, Inc.

B. General Frame Requirements:
1. Distribution Frames: Freestanding and wall-mounting, modular-steel units designed for telecommunications terminal support and coordinated with dimensions of units to be supported.
2. Module Dimension: Width compatible with EIA 310 standard, 19-inch panel mounting.
3. Finish: Manufacturer's standard, baked-polyester powder coat.

C. Floor-Mounted Racks: Modular-type, aluminum construction.
1. Vertical and horizontal cable management channels, top and bottom cable troughs, grounding lug, and a power strip.
2. Baked-polyester powder coat finish.

D. Cable Management for Equipment Frames:
1. Metal, with integral wire retaining fingers.
2. Baked-polyester powder coat finish.
3. Vertical cable management panels shall have front and rear channels, with covers.
4. Provide horizontal crossover cable manager at the top of each relay rack, with a minimum height of two rack units each.

2.05 POWER STRIPS

A. Power Strips: Comply with UL 1363.
1. Rack mounting.
2. Receptacles: Six 20-A, 120-V ac, NEMA WD 6, Configuration 5-20R receptacles for each power strip. Provide two in each rack.
3. LED indicator lights for power and protection status.
4. LED indicator lights for reverse polarity and open outlet ground.
5. Circuit Breaker and Thermal Fusing: When protection is lost, circuit opens and cannot be reset.
6. Cord connected with 15-foot line cord.
7. Rocker-type on-off switch, illuminated when in on position.
8. Peak Single-Impulse Surge Current Rating: 33 kA per phase.
9. Protection modes shall be line to neutral, line to ground, and neutral to ground. UL 1449 clamping voltage for all 3 modes shall be not more than 330 V.

2.06 GROUNDING

A. Comply with requirements in 26 05 26 Section "Grounding and Bonding for Electrical Systems." for grounding conductors and connectors.

B. Telecommunications Main Bus Bar:

1. Connectors: Mechanical type, cast silicon bronze, solderless exothermic-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 ANSI-J-STD-607-A.

2.07 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.

PART 3 - EXECUTION

3.01 ENTRANCE FACILITIES

A. Install underground pathways complying with recommendations in TIA/EIA-569-A, "Entrance Facilities" Article.

B. Install underground entrance pathway complying with 26 05 33 Section "Raceway and Boxes for Electrical Systems."

C. Comply with NECA 1.

D. Comply with BICSI TDMM for layout and installation of communications equipment rooms.

E. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A-7.

F. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

3.02 Cable Tray INSTALLATION

A. Install cable tray level and plumb according to manufacturer's written instructions, rough-in drawings, the original design, and referenced standards.

B. Remove burrs and sharp edges of cable trays.

C. Fasten cable tray supports securely to the building structure as specified in Section 16070, Hangers and Supports. Locate and install supports according to recommendations of NEMA VE 1.

D. Center-Hung Cable Tray: Support center-hung trays on 8 foot centers, at splice connection points, using specified threaded rod support. Run the rod through the vertical holes in the splice connector and secure in place with one nut and washer on top and and one on the bottom of the spine.

E. Make changes in direction and elevation using standard fittings.

F. Make cable tray connections using standard fittings.

G. Locate cable trays below mechanical ducts as required for tray accessibility unless otherwise indicated.

H. Firestop penetrations through fire and smoke barriers, including walls, partitions, floors, and ceilings, after cables are installed, in accordance with Division 7.

I. Working Space: Install cable trays with sufficient space to permit access for installing cables.

J. Install barriers to separate cables of different systems, such as power, communications, and data processing.

3.03 FIRESTOPPING

A. Specified in 07 84 13.

3.04 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

1. Bond the shield of shielded cable to the grounding bus bar in communications rooms and spaces.

3.05 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements in Section 26 05 53 "Identification for Electrical Systems. "Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

B. See Section 27 13 00 "Communications Cabling" for additional identification requirements. See Evaluations for discussion of TIA/EIA standard as it applies to this Section. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 2 of administration including optional identification requirements of this standard.

END OF SECTION 27 11 00

C.