SECTION 27 1100 – NETWORK FACILITY FITTINGS

Revise this Section by deleting and inserting text to meet Project-specific requirements.

This Section uses the term "Architect" or “Engineer.” Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Delete hidden text after this Section has been edited for the Project.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:

1. The current version of the *Uniform General Conditions for Construction Contracts*, State of Texas available on the web site of the Texas Facilities Commission.
2. The University of Houston’s Supplemental General Conditions and Special Conditions for Construction.
3. The University of Houston’s *Network Infrastructure Design Guidelines* (available at https://uh.edu/infotech/services/computing/networks/network-infra-standards/).

1.2 SUMMARY

A. Section Includes:

Revise subparagraph(s) below to suit Project.

1. Fittings for Network Facilities (NFs)
2. Installation and layout details

B. This section covers parts, manufacturers and installation practices for equipment in NFs.

Revise subparagraph(s) below to suit Project.

1.3 PREINSTALLATION MEETINGS

A. Preconstruction Conference: Conduct conference at [**Project site**] <**Insert location**>. The Contractor and the Facilities Project Manager lead the meeting. The UIT Project Manager must be invited to the preinstallation meetings.

Copy subparagraph below and edit for each activity required for preconstruction conference.

1. <**Insert activity**>.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Follow the *Submittal Administrative Requirements* as stated in *Section 01 3300 Submittal Procedures*. For submittals to UIT, use electronic format only.

1.5 ACTION SUBMITTALS

A. Obtain UITNS approval before installation proceeds after each of these submittals

B. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for equipment racks and cabinets.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

C. Shop Drawings: For communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.

D. Grounding: Indicate location of grounding bus bar and its mounting detail showing standoff insulators and wall mounting brackets.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For [**Installer,**] qualified layout technician, installation supervisor, and field inspector.

PART 2 - PRODUCTS

2.1 PARTS AND MANUFACTURERS

A. Refer to *Section 01 2500 Substitution Procedures* for variations from approved manufacturers or parts. **Obtain written approval from UITNS before requesting a substitution for work covered by *Division 27 Communications.***

The paragraph and subparagraphs in this Article demonstrate the line spacing format for subparagraphs not subordinate to the preceding subparagraph.

B. Equipment Racks - Heavy duty aluminum 7' floor mounted racks with cable management channels on both sides and mounting rails for 19 inch equipment are required.

1. Chatsworth Products Inc.

a. Relay Rack: 55053-703
b. Vertical Cable Manager: 30162-703
c. Grounding Bar: 13622-012

2. CommScope

C. Fiber Optic Enclosures

1. Corning

a. 1U: CCH-01U
b. 2U: CCH-02U (use in IDFs)
c. 3U: CCH-03U
d. 4U: CCH-04U (use in BDFs)

2. CommScope

a. 1U: SD-1U
b. 2U: SD-2U (use in IDFs)
c. 3U: SD-4U (holds 6 panels; use in BDFs)
d. 4U: SD-4U

D. Vertical Cable Management

1. Panduit Products

a. 6 in. Wide 7FT Double Sided Black W/Doors: PR2VD06
b. 8 in. Wide 7FT Double Sided Black W/ Doors: PR2VD08
c. 10 in. Wide 7FT Double Sided Black W/ Doors: PR2VD10
d. 12 in. Wide 7FT Double Sided Black W/ Doors: PR2VD12

2. CommScope

a. 6 in. Wide 7FT Double Sided Black W/ Doors: VCM-DS-84-6B 760072785
b. 8 in. Wide 7FT Double Sided Black W/ Doors: VCM-DS-84-8B 760089359
c. 10 in. Wide 7FT Double Sided Black W/ Doors: VCM-DS-84-10B 760089367
d. 12 in. Wide 7FT Double Sided Black W/ Doors: VCM-DS-84-12B 760089375

E. Horizontal Cable Management

1. Panduit Products

a. 1U: NCMHF1
b. 2U: NCMHF2

2. Uniprise

a. 1U: 1375162-1
b. 2U: 1375162-2

F. Basket Cable Tray

1. Cablofil

a. 12 inch x 2 inch - CF54 / 300 EZ
b. 12 inch X 4 inch - CF105 / 300 EZ

G. Paint

1. Flame Control Coatings, LLC

a. NO. 20-20A - Fire Hazard Classification, ASTM E-84 (NFPA 255) Class “A”

H. Uninterruptible Power Supply (UPS)

1. Tripp Lite

a. SMART1500LCD
b. SMART5000XFMRXL

I. Power Distribution Unit

1. Tripp Lite

a. PDU1215
b. PDU1220

J. Rack-mount Monitor Shelf

1. Tripp Lite

a. B020-008-17 Console KVM Switch w/LCD

K. Firestopping Materials

1. EZ-Path

2.2 RELAY RACKS

A. Use equipment racks that are capable of accepting 19 inch equipment, self-supporting and manufactured from high-strength aluminum with two top brackets included for additional strength.

B. Use racks with black finish color. Drill and tap mounting holes each side at 5/8 inch - 5/8 inch - 1/2 inch patterns compatible with EIA 1-1/4 inch- 5/8 inch alternating patterns.

C. Include base flanges with mounting holes drilled through for securing the rack to the floor. Make each mounting hole at least 5/8 inch in diameter.

D. Where the rack is to be mounted to VCT flooring or bare concrete, use an insulating pad, and take care that anchors used to secure the rack to the floor do not come in contact with any reinforcing steel embedded in the concrete slab.

E. In the NFs, reserve space at the top of each rack for fiber enclosures: for BDFs, a minimum of eight Units (8U), and for IDFs, a minimum of six Units (6U).

2.3 CABLE MANAGEMENT

A. Vertical cable management is to be double-sided and narrow or wide depending upon application requirements. Use manager sections with a black finish. Include lockable latching sections and protective edge guards.

B. Use horizontal cable management capable of attachment to a 19 inch rack, maximum 6 inch deep and maximum 2.8 inch high. Use managers with a black finish.

2.4 CABLE RUNWAY

A. Subject to compliance with these specifications, cable runway is to be as manufactured by Legrand Cablofil. Cable runway (basket tray) is required within the NFs to provide a suitable pathway to route all cabling into and out of termination equipment, mounted in equipment racks or on backboards attached to walls, and pathway spaces beyond the NF.

B. Ladder racks: Provide UL classified cable runway and components. Such products are to be UL classified as to its suitability as an equipment-grounding conductor. Ladder racks and components are to have rounded edges and smooth surfaces in compliance with applicable standards, and with the following additional construction features:

1. Dimension: Make the side rail cross sectional area greater than 0.20 square inches, with a height of 1-1/2 inches.
2. Material and Finish: All ladder racks and components are to be made of tubular steel and finished with flat black powder coat paint or gold chem film over zinc plating.
3. Construction: Ladder rack is a prefabricated metal structure consisting of two longitudinal side rails connected by individual transverse members. Ladder rack is to be constructed of 1-1/2 inch x 3/8 inch x .065 inch rectangular steel tubing. Make each cross member a single, continuous, rectangular tube ½ inch x 1 foot x .065 inch with radiused corners. Weld cross members to stringers at 9-inch intervals with ends finished to protect installers and cables.
4. Ladder rack width is 12 inches except as otherwise shown on the Telecommunications Drawings.
5. Space cross members every 9 inches at a minimum.

C. UL Classified Rack Butt-Splice Kit: Consists of 4 splice plates, U-shaped. Overall, 5 inch by 5/8 inch by 11/16 inch thick. Provided with 7/16 inch by 3/8 inch cutout for insertion of trimmed head bolt. Bolt measures 3/8 inch diameter by 2-1/2 inch long provided with hex nut and lock washer.

D. UL Classified Rack Junction Splice Kit: L-shaped splice angles. Overall, 2 inch x 2 inch by 1-1/2 inch, 3/16 inch thick. Secured to cable runway by 3/8 inch diameter by 1-1/2 inch hex bolts, nuts and lock washers.

E. UL Classified 90 Degree Rack Splice Kit: Outside Clamp - Overall, 5-3/4 inch x ¾ inch by 5/8 inch, minimum 0.10 thick. Provided with 7/16 inch by 7/16 inch cutout for insertion of trimmed head bolt. Bolt measures 3/8 inch diameter by 3-1/4 inch long. Provided with hex nut and lock washer. Inside Edge Clamp - Overall, 2-9/16 inch x 15/16 inch x 5/8 inch, minimum 0.10 thick. Provided with 7/16 inch x 7/16 inch cutout for insertion of trimmed head bolt.

F. UL Classified 45 Degree Rack Splice Kit: Outside Clamp - Overall, 4-7/16 inch x 5/8 inch x ¾ inch, minimum 0.10 inch thick. Provided with 7/16 inch x 7/16 inch cutout for insertion of trimmed head bolt. Bolt measures 3/8 inch diameter by 2-11/16 inch long provided with hex nut and lock washer. Inside Edge Clamp - Overall, 2-9/16 inch x 15/16 inch x 5/8 inch minimum 0.10 inch thick. Provided with 7/16 inch x 7/16 inch cutout for insertion of trimmed head bolts.

PART 3 - EXECUTION

3.1 GENERAL

A. NF

1. Do not install IT network equipment in the NFs until they are completely built, cleaned and secured with the UITNS-approved key.
2. Interior walls: Cover interior walls floor to ceiling with fire-rated ¾ inch plywood painted with two coats of a neutral color fire retardant paint. Leave the fire rated stamp visible. Have the Fire Marshall's Office inspect and approve before painting.
3. Cabling within Racks and Enclosures: provide adequate length of cabling. Train conductors to termination terminal points that follow manufactures installation procedures for maintaining cable performance specifications. Provide lacing/mounting bars to restrain cables, to prevent straining connections, and to stop bending cables to smaller radii than minimums recommended by manufacturer.
4. Equipment Racks: Provide 19-inch wide x 7-foot – 0-inch tall, floor-mounted equipment racks, installed per Technical Drawings, with number of vertical rack sections as required to allow space for termination of all fiber and data/voice cabling plus mounting space for multi-port concentrators (Hub/Switches) required to cross-connect all data jacks.
5. Locate/space racks and enclosures according to EIA/TIA guidelines for front and around access.
6. Vertical wire management: double-sided vertical rack cabling sections. Reference Technical Drawings
7. Entrance: Arrange and coordinate locations of distribution frames, patch panels, cross-connections in NFs and racks to optimize space requirements of any service provider requirements, telephone system and LAN equipment.
8. Provide cable runway in equipment room above all racks and up to runway/conduits/sleeves entering room from corridors to form a complete runway system connecting all hardware installations. Attach grounding lugs to each rack/cable raceway, conduit, etc. Refer to Technical Drawings for details.
9. Install trays overhead along the equipment rows, leading to the cross-connects. Coordinate tray locations with lighting, air-handling systems, and fire extinguishing systems so that fully loaded trays do not obstruct or impede their operation. NEC Article 392 provides requirements for cable trays.
10. Provide horizontal cable runways. Equip each 19-inch rack with overhead basket style cable runway installed between the wall and horizontal/equipment racks. Refer to COMMUNICATIONS Technical Drawings for proposed locations and sizing of each runway. Securely attach to wall studs with support brackets (and racks if applicable), in accordance with manufacturer written instructions.
11. Install a grounding bar that measures 12 inches long by 2 inches wide by ¼ inch holes that accepts 2-hole lug connectors. Connect the bar to the main building ground using #2 or greater copper wire.
12. Provide ground lug for each 19-inch rack. Racks shall be grounded to wall mounted ground bus bar using #6 AWG stranded, green jacketed, insulated copper conductor. Furnish all required bonding material and hardware, and bond to building grounding electrode

subsystem TMGB in ER. If crimp connectors are used to bond the #6 AWG wire, follow NEC bonding procedures/specifications.

13. Use an inert dielectric material to separate dissimilar metals apt to corrode through electrolysis under the environmental operating conditions specified.

END OF SECTION 27 1100