

SECTION 28 1000 – SECURITY ACCESS CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENT

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section

1.2 SUMMARY

- A. The Section defines the requirements for the installation of the system. As described elsewhere in these Documents the system consists of twisted pair cabling and hardware, and related hardware. In addition to the basic cable plant requirements, the testing and identification requirements are also defined. Finally, the racks, enclosures, and pathway hardware is also defined herein.

- B. Section Includes

- 1. Twisted Pair Cable
- 2. Patch Pa.1( enc)4394(des)JTJ 0 Tc 0 5.9 4TJ 0 Tc 16952 0 Th P34408.H4 <</MCJ 0 Tc 0 Td I >>BDC -C
- 6. Racks
- 7. Wire Management
- 8. Innerduct

- C. Related Sections

- 1. Section 27 05 00 – Communications Common Work Results
- 2. Section 27 05 24 –



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B. Certifications

1. The Contractor shall possess current certifications by BICSI for the installation and maintenance of all Structured Cabling and associated equipment being provided under the Structured Cabling Contract.
2. The Contractor shall possess current certification for the installation of all required fire stopping to be installed under the scope of the Structured Cable Plant.

C. Samples

1. Northwestern University reserves the right to request samples of components required by these specifications.

D. Mock Ups

1. The Contractor shall provide equipment assemblies for review at the request of Northwestern University.

E. Meetings

1. The Contractor shall be attend all Pre-Construction, Pre-Installation or Progress Meetings that may be called by Northwestern University.

1.6 DELIVERY STORAGE AND HANDLING

A. The Contractor shall r

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- a) Belden
- b) Panduit

F. Equipment Racks

1. Each MC/ER/HC shall be equipped with a 19" Aluminum Rack System to house Owner provided equipment and Contractor provided termination bays for the multiple cable types.
2. 19" Aluminum Rack System
  - a. The rack shall be able to support and organize electronic equipment, cross connection and/or termination hardware for fiber optic cabling, horizontal distribution cabling, riser cabling, or building entrance cabling as may be required by the design. The rack face shall have a conventional equipment mounting width of 19". The rack shall be designed for cable and jumper management and shall have hardware to organize and support cabling and patch cords in the vertical and horizontal planes. The rack system shall be equipped for electrical grounding to meet EIA/TIA 606 Standards, and the designed grounding system. The fastening system for the equipment shall facilitate installation with roll-formed threads in the screw holes for greater strength and durability and the mounting screws shall have pilot points. All rack components shall be charcoal black in color and made of lightweight 6061-T6 extruded aluminum. The rack shall be shipped with all necessary hardware to assemble the frame. It shall be packed in cartons with suitable shipping inserts such that no damage occurs to the rack finish. The finish shall not be scratched, chipped, or marred.
    - b. Self-Supported Rack Framework
      - 1) The self-supporting equipment rack shall be 7' tall with 3" wide channels at each side and with extruded aluminum top angles and base angles providing support. Standard grade frames shall be capable of supporting 700 lbs., with uniform distribution of weight.
      - 2) Standard frames shall provide a .19" thick channel flange and .13" web thickness.
      - 3) Standard base angles shall be .3125" thick, and top angles shall be .1815" thick.
      - 4) Racks shall be able to be mounted side by side and be secured to adjacent racks in a line-up with vertical wire management between each rack.
      - 5) The self-supporting rack shall maintain a UL listing for a telecommunications accessory.
      - 6) Approved Manufacturers and Products shall be:
        - a) Chatsworth – 7' UL Standard Rack
        - b) Equal by Homaco, Ortronics, or Panduit
        - c) All accessories and related hardware associated with a rack shall be provided by the manufacturer of the rack, unless otherwise noted in these Documents.
    - c. Horizontal Wire Management
      - 1) Units shall fit in a standard 19" rack.
      - 2) Units shall be 1U or 2U construction.
      - 3) Units shall be two sided to provide functionality on both the front and back of the rack.
      - 4) Units shall have front and back covers that have a dual hinge technology

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- 5) Access into and out of the top and bottom of the Management shall be finger type construction.
- 6) Approved Manufacturers and Models shall be:
  - a) Chatsworth Products Universal Cable Manager, utilizing two units, in a front/back configuration.
  - b) Equal by Homoco, Panduit, or Ortronics
- d. Vertical Wire Management0.001 Tw 4a1(a1-20 Tc.TJ 0b2.3(an).2(d))kTj 0 Tet12.3(n)]TJ 0( t)-1.1a1

## 3.2 INSTALLATION

## A. Cable Routing

1. Provide a 36" service loop at the end of each work area stub, and a 10' service loop at the TR servicing that drop. The service loop at the TR shall be stored in the cable runway of the TR in a fashion so as to prevent the crushing of the service loop by other cable stacked on the service loop. Should no cable runway or cable tray be available for such service loops, construct a loop storage system of J-Hooks or add an additional section(s) of cable runway to accommodate the service loops.
2. Non-continuous pathways shall keep hallway crossover to a minimum. Furthermore, non-continuous pathways shall be routed so as to follow logical paths parallel and perpendicular to the building structure. Diagonal pathways are unacceptable, unless agreed to by NUIT.
3. In suspended ceiling and raised floor areas where duct, cable trays or conduit are not available, the Contractor shall bundle, in bundles of 50 or less, horizontal distribution wiring with cable ties snug, but not deforming the cable geometry. Where cable bundles are to be supported by J-hooks, the J-hooks shall be attached to the building structure and framework per local codes and regulations at a maximum of five (5) foot intervals.
4. Cables shall be bundled by means of either Velcro or Milli-Ties. Zip-ties are unacceptable.
5. All horizontal cables shall not exceed 90m (295 ft) from the Telecommunications Outlets in the Work Area to the Horizontal Cross Connect.
6. The combined length of jumpers, or patch cords and equipment cables in the telecommunications room/closet and the Work Area shall not exceed 10m (33 ft) unless used in conjunction with a multi-user Telecommunications Outlet.
7. A minimum of three horizontal cables shall be routed to each Work Area, unless otherwise noted on the Drawings.
8. Horizontal pathways shall be installed such that the minimum bending radius of horizontal cables is kept within manufacturer specifications both during and after installation.
9. Telecommunications pathways, spaces and metallic raceways, which run parallel with electric power or lighting cables or conduits, which is less than or equal to 480 Vrms, shall be installed with a minimum clearance of 50 mm (2 inches).
10. The installation of telecommunications cabling shall maintain a minimum clearance of 3 m (10 ft) from power cables or conduits in excess of 480 Vrms.
11. No telecommunications cross connects shall be physically located within 6 m (20 ft) of electrical distribution panels, or step down transformers, which carry voltages in excess of 480 Vrms.
12. Each run of UTP/ScTP cable between the horizontal portion of the cross connect in the telecommunication closet and the information outlet shall not contain splices.
13. The Contractor shall provide all devices for routing the cabling as indicated on the Drawings, and as required by the manufacturer of the Structured Cabling System, so as to maintain the long term health and operability of the Structured Cabling System.
14. In a false ceiling environment, a minimum of 75 mm (3 inches) shall be observed between the cable supports and the false ceiling.
15. Continuous conduit runs installed by the Electrical Contractor shall not exceed 30.5 m (100 ft) or contain more than two (2) 90 degree bends without utilizing appropriately sized



18. Maximum conduit pathway capacity shall not exceed a 40% fill with the exception of perimeter and furniture fill, which is limited to 60% fill for moves, adds and changes, unless otherwise noted on Drawings.
19. Horizontal distribution cables shall not be exposed in the Work Area or other locations with public access.
20. Cables routed in a suspended ceiling shall not be draped across the ceiling tiles. Cable supports shall be mounted a minimum of 75 mm (3 inches) above the ceiling grid supporting the tiles.
21. Cabling shall not be attached to any mechanical, electrical or technology system other than those specifically noted in the Contract Documents.
22. Cabling shall maintain clearance from Line Voltage cabling and devices at all times, and shall be spaced from these devices so as to comply with the TDMM, the NEC, and any other local codes or regulations.
23. Cables shall be bundled by means of either Velcro strap or Milli-Ties. Zip-ties are unacceptable.

#### B. Racks

1. All racks shall be anchored to the floor, structure below or wall as directed by the manufacturer. And shall comply with any seismic requirements as directed by any local, state or federal regulations.
2. All racks shall be assembled as directed by the manufacturer with the addition of any supplemental grounding requirements listed elsewhere in these Documents.
3. All racks shall be assembled with a vertical wire management located at each side of each row of racks, and on vertical wire management between each two adjacent racks, unless directed otherwise within these Documents.
4. All racks with active electronics mounted within, or indicated as having active electronics installed by others, or in the future shall have a vertical power distribution unit mounted on the rear.

### 3.3 LABELING

#### A. General Labeling Requirements

1. The SCC shall label, all cables, faceplates, cabling enclosures, patch panels, termination blocks, racks, equipment enclosures and related hardware.
2. All work shall be in compliance to TIA/EIAec7.1(e)-1dtdwa-d [(i)3.1(ns)-8(t)-12131 0(7.1(ent)-1.1(ed 0 (t3)T

10. As previously indicated, all electronic documentation shall be recorded onto a readable CD. All files contained on the CD shall be in the native format of the software in which it was generated, as well as a plain text format.

B. Work Area Floor Plans

1. Each Horizontal Cross Connect shall contain a lexan covered copy of the floor plan(s) associated with the work area outlets serviced by the Cross Connect.
2. The size of the plans shall be equal to the size of the Contract Drawings, unless Contract Drawings exceed 30" x 42", in which case half size prints are to be utilized.
3. The plans shall be affixed by means of compression between the lexan cover and the backboard to which it is mounted. The Contractor shall make provisions to assure that the plans cannot accidentally fall from behind the lexan.
4. For cross connect locations that are smaller than TIA standard locations, half size plans shall be permitted.
5. The Contractor shall utilize the final set of Record Drawings when providing these plans.

C. Faceplate Labeling

1. All faceplates shall be labeled with the Horizontal Cross Connect and Faceplate Number.
2. The faceplate number shall be derived based on the room in which the faceplate is located, and a sequential number, e.g. TR01-138-01, where TR01 is the Telecommunications Room, 138 is the room number of the location of the faceplate and 01 indicates that this is the first faceplate in the room.
3. The label shall be permanently affixed to the faceplate in a location specifically engineered by the manufacturer to contain such information, or shall be neatly engraved directly on the faceplate and painted to facilitate easy recognition of the information.
4. The individual jack positions shall be identified with sequential letters, either by means of a pre-manufactured engraving or molding, or by installation of a machine generated label installed in a location specifically designed to hold such a label.

D. Patch Panel Labeling

1. All patch panels shall be labeled as to the identity of the patch panel.
2. The patch panel identification shall be derived based on the rack in which it is mounted and a sequential letter, e.g. TR01A-PP03, where TR01A is the rack ID, and PP03 indicates that this is the third patch panel in the rack.
3. The label shall be installed in the space provided by the manufacturer for this purpose. If no space is provisioned, the Contractor shall provide a laminated placard that shall be engraved with the identification of the patch panel, and shall be mounted in the upper right corner of the patch panel, but shall not block the proper installation of the patch panel.
4. All ports shall be labeled with the ID of the faceplate terminated at that port, and the associated jack letter from the faceplate.

E. Rack Labeling

- 1.

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1. All UTP cables shall be marked at both ends of the cable jacket, at approximately 2" from the end of the sheath, with a self adhesive label.
2. The label shall have the exact location of the point of service, i.e. the TR, rack or block

3.4 FIELD QUALITY CONTROL

A. Site Test, Inspection

- 1.

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3.5 CLEANING

- A. All equipment and Materials furnish, installed or provided shall be cleaned of all debris construction or otherwise prior to Owner final Acceptance.

3.6 DEMONSTRATION

- A. Upon completion of all installation, termination and testing, the Contractor shall review the entire installation with NUIT. At the time of this review, the Contractor shall present the hard copies of all unadulterated test results.

3.7 PROTECTION

- A. The Contractor shall protect all aspects of the cabling system from damage during the time period from the notice to proceed through the point of Owner Acceptance

**END OF SECTION 28 1000**