DIVISION 27 – COMMUNICATIONS

27 00 00 – COMMUNICATIONS

A. System design shall be completed by a Registered Communications Distribution Designer (RCDD).


C. Specify only products listed and classified by Underwriters Laboratories, Inc.

27 13 00 – COMMUNICATIONS BACKBONE CABLELING (VOICE & DATA)

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Data systems
B. Fiber Optic systems
C. Premises wiring and outlets

1.02 RELATED SECTIONS

(to be filled in by Design Professional)

1.03 REFERENCES

A. Category 6A requirements found in the following ANSI, TIA/EIA, and TSBs.


D. TIA/EIA-607 – Commercial Building Grounding and Bonding Requirements for Telecommunications; 1997.

E. TIA/EIA-569-AB – Commercial Building Standard for Telecommunications Pathways and Spaces. See also addendums 1-4.

F. NFPA70 – National Electric Code; National Fire Protection Association; Most current addition.

H. TIA/EIA TSB-72 – Centralized Optical Fiber Cabling Guidelines.

I. UL444 – Standard for Safety for Communications Cable.

1.04 SUBMITTALS

A. See Section ----- Submittals, for submittal procedures.

B. Submit telecommunications room layout per communication standards.

C. Provide sample of each type of modular jack, faceplate, and data wire.

D. Product data:
   1) Materials list of items proposed under this section.
   2) Manufacturer’s spec and other data needed to prove compliance with the specified requirements.
   3) Manufacturer’s recommended installation procedures, approved by the Engineer, will become the basis for acceptance or rejection of the procedures used on the installation work.

E. Shop Drawings: Show detail of all materials used on job. Modular outlets, Cable types, accessories, and related equipment.

1.05 QUALITY ASSURANCE

A. Work shall be done in accordance with the manufacturer’s recommendations of the equipment to be supplied and installed under this contract.

B. Perform work in accordance with the telephone utility’s rules and Regulations and NFPA70.

C. Products: Furnish only the specific products listed in this section. No Substitutes.

1.06 QUALIFICATIONS

A. Manufacturer: Commscope/Systimax only. No substitutes.

B. Installer: Personnel installing and terminating the Commscope Cabling system shall be trained for data installations, and testing work. All installers/testers shall provide proof of training. Only Commscope or BICSI training certificates will be acceptable. Proof of training shall be submitted to Owner of the cable plant, for review prior to start of work.
1.07 SYSTEM DESCRIPTION

A. Cable trays, conduits, surface raceways, copper cable, optical fiber cable, and modular connectors to form physical pathway and data channel for voice and data systems.

B. The data cable distribution is intended to be a Category 6A Open System Architecture in accordance with TIA/EIA 568 Standard.

C. Workstation data outlets shall include: (2) 8 position-8 conductor modular outlets. The two data jacks shall be Category 6A rated and blue in color. Each jack shall be fed by an individual 4-pair station wire so all pins are active. Two (2) data cables are required for each data outlet. Include 2 data patch cords (one for office and one telcom room) for 80% of the total data jacks in the facility. See Owner’s representative with cable quantity questions.

PART 2 PRODUCTS

2.01 SERVICE AND PATHWAYS

A. Horizontal pathways shall conform to TIA/EIA-569-AB, using the Backboards and raceways as indicated.

B. Every data outlet location and every wireless access location shall be a 4-inch by 4-inch by 2-1/4 inch deep square outlet box with single-gang mud rings. All boxes will be connected to the nearest cable tray with a continuous 1-inch conduit. All conduits grounded and bonded per TIA 569-B 7.3.2. In addition, the University of Northern Iowa requires all metallic conduits and raceways be grounded and bonded to the cable tray system using approved components.

C. All data outlets and all wireless locations shall have a single-gang quadplex faceplate with modular data jacks (blue) in positions 1 and 2. Positions 3 and 4 will be blanked with ivory inserts.

2.02 BACKBOARDS

A. Telcom room backboards: Plywood
   1. Coated with fire-retardant gray paint.
   2. Size: floor to 8ft height on all walls of telcom room.

2.03 COMPONENTS

A. Modular Information Outlet Faceplates
   1. Commscope M14SP quadplex faceplate
   2. Comcode: 108 615 204
   3. Color: Stainless Steel
   4. Provide ivory blank inserts for unused openings
   5. Comcode: 107 067 860
B. Modular Outlets  
   1. As specified in the Materials List at the end of this document

C. Telcom Room Equipment racks  
   1. Aluminum relay racks, clear finish  
   2. CPI part# 55053-503. No substitutes.

D. Telcom Room Wire Management  
   1. Chatsworth Extra Wide Vertical Rack Cabling Sections  
   2. CPI part# 30166-703. No substitutes.

2.04 VOICE EQUIPMENT  

Owner shall provide and install a 100 pair dialtone cable into the Facility.  
Owner shall be responsible for any voice related terminations.

2.05 DATA SYSTEMS EQUIPMENT  

A. Cross Connect Hardware (modular panels)  
   1) For use with Avaya 2091B wiring systems  
   2) CommScope M2000 frames – 2U – 48 port  
   3) Comcode: 760 049 940

B. Category 6A Modular Data Jacks  
   1) To be installed in Quadplex faceplates  
   2) Commscope MGS600-318  
   3) Wired TIA/EIA 568B  
   4) Comcode: 760 092 452  
   5) Color: Blue  
   6) No substitutes

C. Station Cable  
   1) UL Listed Category 6A, plenum rated  
   2) Unshielded twisted pairs  
   3) Commscope 2091B Cable  
   4) Comcode: 760 107 201  
   5) Color: Blue  
   6) No substitutes

D. Patch Cord Assemblies  
   1) CommScope Patch cords – light blue in color  
   2) Telcom room – 7ft lengths  
   3) CommScope# CPCSSX2-02F007  
   4) Office rooms - 10ft, 14ft, 19ft, 25ft  
   5) CommScope# CPCSSX2-02F010  
   6) CommScope# CPCSSX2-02F014
E. Data Connection Labeling

1) Label both ends of each connection.

2) Data labels shall be: room#-1, room#-2, room#-3
   Example: room 240 with four data connections would
   Be 240-1  240-2  240-3  240-4.

3) Wireless labels shall be room#-1W, room#-2W, room#-3W.
   Example: room 240 with three access points would be; 240-
   1W, 240-2W, 240-3W.

4) Every data label must contain a dash.

2.06 Optical Fiber Systems Equipment

A. Building Entrance Optical Fiber

1. All Building Entrance Optical Fiber, connectors, and supplies,
   Shall be purchased and supplied by Owner. Constructor shall
   only be responsible for pulling in the plenum fiber cables inside the
   Facility. The Owner shall be responsible for termination, testing and
   labeling.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pathway Installation

1. Provide complete conduit system from outlets to cable tray
2. All telecommunications conduits shall be 1-inch minimum
   Trade size.
3. Any surface raceways shall be Wiremold 2400 trade size
   minimum.
4. Any floor box locations shall be the Hubbell SystemOne with
   Duplex/Duplex sub plates. One duplex opening for power and one
   duplex opening for data jacks. Use Commscope 106 frames under
   the sub plate. Frame accepts up to four data connections.
5. All metallic conduits shall be grounded and bonded to the Cable
   Tray system with approved components.
6. Provide data labels on both ends of the cable run.
7. Provide pull string in any spare conduit up to cable tray.
8. Support raceways and conduits according to Section -------
B. Data Wire and Cable Installation
   1. No data runs shall be longer than 90 meters
   2. Install according to manufacturer’s installation guidelines
   3. Wire connections to TIA/EIA 568B
   4. Finished installation shall meet the most current Category 6A draft system installation standards.
   5. Splices, bridge taps, and repairs to wiring are NOT acceptable. Replace all damaged cables.
   6. Maintain pair twists up to termination.
   7. Replace all cables that fail Field quality Control testing. If only the termination is the cause of the failure, re-termination is acceptable.
   8. Ground and bond racks and patch panels in accordance with NEC and TIA/EIA-607.
   9. Labeling sequence for data outlets is room# followed by a dash, followed by jack#. Example: room 240 has four data jacks. Data labels would be 240-1 240-2 240-3 240-4.
   10. Dashes must always be present in the data labels.
   11. When entering a room with multiple faceplates, enter room, turn left, and label clockwise around the room.

C. Fiber Cable Installation
   1. Install in accordance with manufacturer’s instructions.
   2. Maintain bending radius as required. Conduit installations must meet the fiber bending radius requirements.

D. Field Quality Control
   1. Testing Equipment: Microtest OmniScanner or equivalent.
   2. Test equipment must be capable of testing vendor specific cables.
   3. Tester must be ROM based and able to select Commscope 2091B cable, for testing of data connections. All test equipment shall have the most current ROM based version of the Commscope cable types.
   4. Tester must be capable of testing Avaya 2091B cable for:
      i. Wiremap
      ii. Length
      iii. Attenuation
      iv. Return Loss
      v. NEXT
      vi. ELFEXT
      vii. PSNEXT
      viii. PSELFEXT
   5. Notify the Owner at least 48 hours before testing begins.
6. The Owner may observe any or all testing.

7. Label individual test results to match the label that appears on the Faceplate of the jack being tested.

8. Deliver the scanner to the Owner’s representative immediately After testing, to allow downloading of the test results.

9. Provide one electronic copy of results to Owner.

E. Frequency of Testing

1. Test 100% of all data and voice outlets installed.

2. Conduct testing after terminations have been made at the wall Outlet and the modular panel.

3. Retest all cables that have been re-terminated or re-installed.

F. Optical Fiber Testing

1. All optical connections must be tested end to end with an Optical Time Domain Reflectometer. (OTDR)

2. Multimode fibers shall be tested at 850 and 1300 nanometer Wavelengths, in both directions.

3. Singlemode fibers shall be tested at 1310 and 1550 nanometer Wavelengths, in both directions.

4. Acceptable connector loss shall be less than 0.5 dB per mated Pair. Acceptable splice loss shall be less than 0.2 dB, per the Manufacturer’s calculated maximum loss per KM.

MATERIALS LIST

Data Wire: Commscope 2091B Wire (plenum)
Color: Blue
Comcode: 760 107 201

Data Panel: Commscope M2000 frame (2U – 48 port)
Comcode: 760 049 940

Data Jacks: Commscope MGS600-318
Color: Blue
Comcode: 760 092 452

Data Patch Cords: Commscope CPCSSX2-02F007 – 7ft
07/2016

7
Commscope CPCSSX2-02F010 – 10ft
Commscope CPCSSX2-02F014 – 14ft
Commscope CPCSSX2-02F019 – 19ft
Commscope CPCSSX2-02F025 – 25ft
All are Light Blue in color

Building Entrance
Circa Enterprises 1880ENA1/NSC
Protection
110 connector in – 110 connector out
Vendor# 1880ENA1/NSC100

Stainless Steel
Commscope M14SP Quadplex Faceplates
Wall Faceplates
Comcode: 108 615 204

Racks:
Chatsworth (CPI) Aluminum 7ft Racks
CPI# 55053-503

Vertical Wire
Chatsworth (CPI) extra wide Vertical Rack Cabling Section
Managers
CPI# 30166-703

Optical Fibers
All optical fiber cables shall be Corning Plenum rated
12 strands of 8.3 single mode. Yellow in color.

Building Entrance Fiber Cables
Owner of Cable Plant shall spec and install all building entrance
fiber cable. Contractor will not be responsible for any building entrance
Fiber cables.

Fiber Housings
Corning PCH-01U Housing

Housing Panels
Corning CCH Reduced Depth Modules
12 fiber – SC Duplex – Single mode w/3 meter pigtail
Coming part# CCHR1259P03RH

Splice Trays
Corning Reduced Length Splice Tray
Type 4R tray – 0.4 inches thick
Coming part# M67-110

Splice tray bracket
Corning splice tray bracket that holds splice trays
Inside the PCH-01U housing
Coming part# PC1-SPLC-04R

Shrink Protectors
Bag of 50 heat shrink protectors (60 mm lengths)
Coming part# 2806031-01

Fiber patch cables
All fiber patch cables shall be Corning 8.3 single mode.
All shall be terminated SC-SC in 2 meter lengths

27 41 00 – AUDIO-VIDEO SYSTEMS

A. See Media Resources Department for requirements and details.

27 50 00 – DISTRIBUTED COMMUNICATIONS AND MONITORING SYSTEMS
07/2016
27 53 13 – CLOCK SYSTEMS

A. The campus has installed a wireless clock system transmitter with signal coverage over the entire main campus. Campus clock standard is Primex #14180, 12.5” silver brushed aluminum.

B. During project design the consultant shall identify clock locations and show them on plan. Owner will purchase the clocks during construction and turn over to the contractor to mount. Clocks are battery operated, self synchronizing.