

NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT
SECTION 27 13 00 – COMMUNICATIONS COPPER BACKBONE CABLING
SAMPLE SPECIFICATION

RELATED SECTIONS:

Section 27 00 00 General Requirements
Section 27 02 00 General Communication Requirements
Section 27 05 00 Common Work Results for Communications
Section 27 05 26 Grounding and Bonding for Communications
Section 27 05 28 Pathways for Communication Systems
Section 27 05 37 Fire-stopping For Communication Systems
Section 27 10 00 Structure Cabling Testing
Section 27 12 00 Communication Requirements for (RF) CATV System
Section 27 12 23 ABF Fiber Optic Cabling
Section 27 15 00 Communications Horizontal Cabling
Section 27 16 00 Communications Connection Cords

PART 1 - GENERAL

1.1 WORK INCLUDED

Provide all labor, materials, and equipment for the complete installation of all voice backbone applications called for in the Contract Documents. Provide sufficient pair count to support 100% expansion at the outlet locations.

1.2 SCOPE OF WORK

- A. This section includes the minimum requirements for Inter and Intra Building Copper Backbone Cables.
- B. Included in this section are the minimum composition requirements and installation methods for the following:
 - Intra-Building Backbone (Inside buildings (ISP))
 - Inter-Building Backbone (Between buildings (OSP))

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. 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, equipment shall be equivalent in every way to that of the equipment specified and subject to approval.
- B. 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.
- C. Material and work specified herein shall comply with the applicable requirements of the current adopted revision of the following:
 - ANSI/TIA – 568 Series Commercial Building Telecommunications Cabling Standard,
 - TIA – 569 Commercial Building Standard for Telecommunications Pathways and Spaces,
 - ANSI/TIA – 606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings

NAME OF PROJECT
PROJECT LOCATION

Communication Copper Backbone Cabling
27 13 00

XX% CONSTRUCTION DOCUMENTS – DATE HERE

NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT
SECTION 27 13 00 – COMMUNICATIONS COPPER BACKBONE CABLING

SAMPLE SPECIFICATION

ANSI-J-STD – 607 Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
NFPA 70 – National Electric Code
BICSI – Telecommunications Distribution Methods Manual

1.4 SUBMITTALS

- A. The Contractor shall submit Cable Manufacturer's data, including part numbers, cut sheets and detailed descriptions, for all proposed equipment.
- B. The Contractor shall submit Manufacturers cut sheets, specifications and installation instructions for all products (submit with bid).
- C. The Contractor shall submit installation plan indicating:
 1. Equipment and personnel
 2. Materials and staging area
 3. Start and completion dates
 4. Locations, including floor, room and building.
- D. The Contractor shall submit a copper cable pulling plan for all multi-pair copper cables with a pair count of 25 pairs or greater, that includes, but is not limited to, the following:
 1. Each cable run and route.
 2. Date and duration of the pull.
 3. Pulling methodology and equipment setups.
 4. Pulling tension calculations for each pull in the run.
 5. Safety issues and precautions to be taken.
- E. Product data for all termination and test equipment to be used by Contractor to perform work.
 1. Equipment shall be calibrated with traceability to National Institute of Standards and Technology (NIST) requirements.
 2. Contractor shall include copy of calibration and certification that equipment calibration meets NIST standards and has been calibrated at least once in the previous calendar year.

PART 2 – PRODUCTS

2.1 Intra-Building Copper Backbone for Analog/Voice only

- A. All cable shall be listed for use per the National Electrical Code (NFPA-70).
- B. Cable shall meet one of the following, per bid document:
 1. UL-listed CMR cable: Solid copper conductors with high-density polyolefin insulation and overall low smoke PVC jacket to achieve riser (i.e., non-plenum) rating by UL standards
 2. UL-listed CMP cable: Solid copper conductors with FEP insulation and overall low smoke PVC jacket to achieve plenum rating by UL standards
 3. LSZH cable: Solid copper conductors with non-halogen HDPE insulation and low smoke, zero halogen, compound jacket to achieve LSZH rating by:
 - IEC 60754—Part 2.
 - IEC 61034—Part 2.
 - IEC 60332—Part 1.
 - Def Stan 713.

NAME OF PROJECT
PROJECT LOCATION

Communication Copper Backbone Cabling
27 13 00
XX% CONSTRUCTION DOCUMENTS – DATE HERE

NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT
SECTION 27 13 00 – COMMUNICATIONS COPPER BACKBONE CABLING

SAMPLE SPECIFICATION

- C. Cable shall meet the requirement of ANSI/TIA/EIA-568 series Standards for Category 3 performance.
 - D. Approved Manufacturer:
 - 1. CommScope, Inc.
 - XXXX XX (25 pair Plenum Rated)
 - XXXX XX (25 Pair Riser Rated)
 - XXXX XX (50 Pair Riser Rated)
 - XXXX XX (100 Pair Riser Rated)
 - 2. Superior Essex, General Cable Or equivalent
(Enter Approved Materials & Product List)
- 2.2 Inter-Building Copper Backbone
- A. All cable shall be manufactured and constructed for use in the Outside Plant Environment.
 - B. Cable shall meet the requirement of ANSI/TIA/EIA-568 series Standards for Category 3 performance
 - C. Approved manufacturer of multi-pair armored cable shall be industry leader and approved in the submittal process as per submittal requirements in contract SOW. Superior Essex, General Cable Or equivalent
 - D. (Enter Approved Materials & Product List)
- 2.3 Building entrance protection for copper cabling shall be installed utilizing a two (2) foot fuse link between outside plant cable plant splice and the protector module with IDC-type input and output terminals, 100 pair-pair capacity and female mounting base, equipped with 230 volt solid state protector modules. Sufficient protector modules shall be provided to completely populate all building entrance terminals.
- 2.4 Backbone cables shall have a minimum 10-foot service loop when terminated in the ER and TR, and at any splice points in telecommunications manholes.
- 2.5 PROTECTOR PANELS
- A. Entrance Terminals - CIRCA (Enter Approved Materials & Product list)
 - B. Protector Modules – CIRCA (Enter approved Materials & Product List)
- 2.6 COPPER TERMINATION HARDWARE
- A. Hardware shall:
 - 1. Be designed for use in 568 compliant structured cabling systems
 - 2. Be wall mountable with legs that permit cables to be routed behind
 - 3. Be molded in fire resistant plastic that meets applicable fire safety standards
 - 4. Have index strips that are colored to facilitate wiring
 - 5. Include 4-pair and/or 5-pair connecting blocks
 - 6. Include label holders and labels
 - B. Basis for Design Specifications: CommScope 100 & 300 pair 110 kits
 - C. Approved Manufacturer: CommScope
 - D. Cross Connect and Entrance Facility

NAME OF PROJECT
PROJECT LOCATION

Communication Copper Backbone Cabling
27 13 00
XX% CONSTRUCTION DOCUMENTS – DATE HERE

NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT
SECTION 27 13 00 – COMMUNICATIONS COPPER BACKBONE CABLING

SAMPLE SPECIFICATION

1. 110AB2-100FT - 110 Field Terminated Cross-Connect System Terminal Blocks, 4 X 110C-5, 20 X 110C-4
2. 110AB2-300FT - 110 Field Terminated Cross-Connect System Terminal Blocks, 12 X 110C-5, 60 X 110C-4
3. 48 Port 1U Angled Patch Panels filled and terminated with appropriate number of black M-series outlets:

(Enter Approved Materials & Product List)

PART 3 - EXECUTION

3.1 INSTALLATION

A. GENERAL - Inter and Intra Building Copper Backbone Cable

1. Contractor shall comply applicable codes, standards and with all local codes and requirements. It is the responsibility of the contractor to identify and adhere to any unique codes or requirements governed by the region where the work is to be performed.
2. Provide all necessary products for installation of Copper Backbone cablings to include cable attachments, etc.
3. Copper cable shall not be installed outside of the rated installation temperature for the cable type.
4. Backbone cable shall be installed following industry standard practices.
5. All Outside Plant Backbone cable shall terminate on Primary protection (per the NEC) upon entering the building.
6. All installations shall comply with:
 - ANSI/TIA – 568 Series Commercial Building Telecommunications Cabling Standard,
 - TIA – 569 Commercial Building Standard for Telecommunications Pathways and Spaces,
 - ANSI/TIA – 606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - ANSI-J-STD – 607 Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
 - NFPA 70 – National Electric Code
 - BICSI – Telecommunications Distribution Methods Manual

B. BACKBONE CABLE TESTING

1. Complete end-to-end test results for all copper UTP cables installed are required.
2. All multi-pair copper cable pairs installed shall be tested to TIA/EIA 568A, Category 3 performance specifications. In addition, provide loop resistance measurements in ohms and dB loss at 1KHz, 8KHz, and 256KHz.
3. The Owner is to be notified at least 24 hours prior to testing to allow observation at the Owner's discretion. If the Owner confirms his intention to observe, a reasonable starting time shall be agreed upon. Should the Owner not be present at the scheduled commencement time, the Contractor may begin testing as scheduled.

NAME OF PROJECT
PROJECT LOCATION

Communication Copper Backbone Cabling
27 13 00
XX% CONSTRUCTION DOCUMENTS – DATE HERE

NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT
SECTION 27 13 00 – COMMUNICATIONS COPPER BACKBONE CABLING

SAMPLE SPECIFICATION

4. 100% of all pairs in backbone copper cables shall be tested for continuity and wire-map.
 5. Testing Format: Test Results must be submitted in two (2) formats. First, must be original file(s) down loaded from tester. Second, the file must be cohesively placed in Excel format with the following fields:
 6. ER/TR RM # / RM # of drop / Port # / all relevant test information in as many fields as necessary.
 7. All test results are to be recorded and submitted to the Owner.
- C. CABLE AND TERMINATION PANEL CABLE TESTING
Label the installed cables in accordance with **Section 27 10 00**
- D. CABLE SUPPORT
1. Provide cable supports and clamps to attach cables to backboards and walls.
 2. Attach horizontal and vertical backbone cables at 2 foot intervals using Owner approved supports; such as D-rings or jumper troughs utilized for wire management.
 3. Attach cables to manhole racks using industry standard practices.
 4. Backbone cabling shall be secured to the cable/ladder tray following manufacturer recommended procedures, and appropriate installation hardware and methods as defined by local code or the authority having jurisdiction (AHJ).
- E. AS-BUILT DRAWINGS
1. CAD Files: Provide CAD files in Drawing formats showing floor plans with room numbers and actual backbone cabling and pathway locations and labeling. The deliverable is required within 5 business days of final cable testing.
 2. Red Line Drawings: Contract must kept one (1) (**Enter Size Required Here**) size set of floor plans on site during work hours showing installation progress marked and backbone cable labels noted. Contractor may be asked to produce these drawings for examination during construction meetings or field inspections.

END of SECTION

NAME OF PROJECT
PROJECT LOCATION

Communication Copper Backbone Cabling
27 13 00
XX% CONSTRUCTION DOCUMENTS – DATE HERE