

SECTION 27-13-14 COMMUNICATIONS COPPER OSP CABLING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The work covered by this section of the Specifications includes all labor necessary to perform and complete such construction, all materials and equipment incorporated or to be incorporated in such construction and all services, facilities, tools and equipment necessary or used to perform and complete such construction. The work of this section shall include, but is not limited to, the following:
 - 1. A complete copper twisted pair outside plant (OSP) backbone cabling system to support voice circuit distribution as well as data communications with cables, termination hardware, splices, and necessary installation and supporting hardware.

1.02 QUALITY ASSURANCE

- A. Refer to Section 27-00-00 for general details.
- B. As noted in Section 27-00-00, all contractors and installers working on structured cabling system elements shall hold a current manufacturer's certification for each individual component they install.

1.03 CODES, STANDARDS, AND GUIDELINES

- A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations in Section 27-00-00.
- B. Customer Owned Outside Plant Design Manual (BICSI)
- C. The Cal Poly ITS Telecommunications Standards Document

1.04 SUBMITTALS

- A. Refer to Section 27-00-00 for general details.
- B. Shop Drawings:
 - 1. Shop drawings shall show the OSP backbone pathways, locations and type of terminal blocks, entrance protectors, pair counts and cable designations at termination points.
 - 2. Shop drawings shall show the layout of the distribution frames in the EF and the TRs/ERs with pair counts by each wiring block.
- C. Submit Manufacturer's Cut Sheets for the following:
 - 1. Any products not specifically listed in the PRODUCTS section shall require a submittal of the manufacturer's cut sheets and approval by the Cal Poly ITS Telecomm group.
- D. Manufacturers Testing:
 - 1. Submit as testing results as required by Section 27-08-13.

1.05 IDENTIFICATION

- A. Outdoor cables must be labeled with 1" white nylon labels with black machine generated lettering within 18" of all conduit endpoints and both cable endpoints. Within all underground structures larger than 3' in any dimension, label each cable as it enters the structure, and when it exits the structure.
- B. Refer to Section 27-05-53 for additional details.

1.06 DEFINITIONS

- A. N/A

1.07 WARRANTY

- A. Refer to Section 27-00-00 for general details.

PART 2 – PRODUCTS

2.01 PRODUCT CONSISTENCY

- A. Product Consistency: Any given item of equipment or material shall be the product of one manufacturer throughout the facility. Multiple manufacturers of any one item will not be permitted.

2.01 COPPER OSP CABLES – GENERAL

- A. Cable jacket marking: Must be legible and shall contain the following information:
 - 1. Manufacturer's name
 - 2. Copper Conductor Gauge
 - 3. Pair Count
 - 4. UL and CSA listing
 - 5. Manufacturer's Trade Mark
 - 6. Category rating
 - 7. Sequential foot markings, in one foot increments

2.02 COPPER OSP CABLE (BACKBONE CABLE)

- A. Cables shall be specifically PE89, gel filled, qualpeth sheathed with aluminum shield, 22 AWG, multi-pair cables.
- B. See one line diagram in the Drawings for required pair counts.
- C. Minimum performance specifications: The cables shall meet the requirements of ANSI/EIA/TIA-568B for 100- Ohm UTP Multi-pair Backbone Cable.
- D. Approved Manufacturer: Superior Essex or Cal Poly ITS Telecomm group approved equal

2.03 COPPER OSP CABLE (CAT 6 STATION CABLE)

- A. Cable shall be Category 6 UTP Cable, outdoor, flooded gel, black jacket, 4 pair count.
- B. Approved Manufacturer: Commscope or Cal Poly ITS Telecomm group approved equal

2.04 COPPER OSP CABLE (CAT 3 STATION CABLE)

- A. Cable shall be Category 3 UTP Cable, outdoor, black jacket with a rip cord, 6 pair count.
- B. Cable shall be suitable for direct burial, gel filled, with an aluminum shield.
- C. Approved Manufacturer: Superior Essex or Cal Poly ITS Telecomm group approved equal

PART 3 – EXECUTION

3.01 GENERAL

- A. Location and placement of termination blocks and cable types shall be as shown on the Drawings.
- B. Do not install cross-connects until after the cable test reports have been accepted by the Cal Poly ITS Telecomm group representative. *Cross-connects are typically installed by the Cal Poly ITS Telecomm group.*

3.02 QUANTITIES

- A. Quantities of system elements shown on the drawings shall be illustrative only and are meant to indicate the general configuration of the work. The Contractor shall be responsible for providing the correct quantities of materials to construct a system that meets the intent of these Specifications and the relevant codes.

3.03 INSTALLATION

- A. OSP Cable Installation
 - 1. Install OSP cables in accordance with all Specifications and Drawings.
 - 2. All OSP cables shall run from the termination locations indicated on the copper cable riser diagram or site plan through the dedicated pathways and spaces identified in the Telecommunications Drawings and into their respective EF/TR/ER.
 - 3. All OSP cables shall be terminated on protector panels in a TR/ER or EF.
 - 4. Cables terminating at an outside endpoint shall be required to have an entrance protector covering all pairs, including spares.
 - 5. Cables running on ladder racking within an EF/TR/ER shall be neatly placed and lashed to the horizontal and vertical ladder racking with wire ties at every rung.
 - 6. At the same time cable is pulled into a conduit also install a pull rope to facilitate future cable pulls along all pathways. Pull rope to be (minimum) nylon ¼" 600 lb. pulling tension.
 - 7. Observe all manufacturers' written specifications, specifically in regard to pulling tensions for cables and allowable methodologies for installation.
- B. Cable Terminations
 - 1. Cable pair twists shall be maintained up to within ½ in. of the point of termination.
 - 2. Under no circumstances shall cable pairs be untwisted or otherwise altered prior to termination.
 - 3. All terminations shall follow industry standard uniform color codes.
 - 4. ***Submit Shop Drawings to the ITS Telecomm group for approval of block field, protector and splice case layouts and locations as well as OSP cable routing before starting work.***

- C. Gel Sealant
 - 1. All gel filled cables shall require use of a gel blocking sealant at any point that the gel is exposed.
 - 2. Follow all manufacturers' specifications for proper application of gel block sealant.

3.04 GROUNDING & BONDING

- A. Each OSP cable shall be grounded with a Shield Bond Connector via a #6 AWG copper wire to the TGB/TMGB or ground rod if at an outside endpoint.
- B. Each protector shall be individually grounded via a #6 AWG copper wire to the TGB/TMGB or ground rod if at an outside endpoint.
- C. Refer to Section 27-05-26 for additional details.

3.05 TESTING

- A. For testing details see Section 27-08-13

3.06 ACCEPTANCE

- A. 100% of the copper pairs tested per cable shall meet requirements for the whole of the installation to be accepted.
- B. Upon receipt of the Contractor's documentation of cable testing, the Cal Poly ITS Telecomm group representative shall review/observe the installation and randomly request tests of the cables/wires installed. Once the installation and testing has been completed and the campus telecommunications representative is satisfied that all work is in accordance with the Contract Documents, the representative shall notify the Contractor and/or campus project manager in writing or via email.

3.07 RECORD (AS-BUILT) DRAWINGS

- A. The Project Record Drawings shall show the types and locations of all OSP cabling, and all OSP termination points. Drawings shall include identifying information from the cable label.
- B. Provided documentation shall include Butterfly Drawings for each vault, detailing specific conduit utilization for each cable.

END OF SECTION

DOCUMENT VERSION CONTROL

REVISION	DATE	AUTHOR	REASON
1	02/20/14	R. VOLK	INITIAL DOCUMENT DEVELOPMENT
	02/20/14	DW & MH	PRIMARY REVIEW COMPLETE