

SECTION 27-15-13 STRUCTURED CABLE SYSTEM (SCS)

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 structured cabling system composed of Category 6 unshielded twisted pair station cabling system with all cables, termination hardware, outlets and necessary installation and supporting hardware in accordance with the strictest manufacturer written recommendation, the specification, and Cal Poly ITS Telecomm Labeling, Design & Syntax Standards in Appendix B.

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. The Cal Poly ITS Telecom group, Telecommunications Standards Document and the Labeling, Design and Syntax Standards in Appendix B.

1.04 SUBMITTALS

- A. Refer to Section 27-00-00 for general details.
- B. Shop Drawings:
 - 1. None Required
- 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.
- E. Documentation supporting the proposed warranty and all terms and conditions.
- F. All certifications (individual and company) as required by guarantor of the above mentioned warranty shall be submitted. These certifications shall only include those persons with direct association with this project and includes the expiration date and full name of each individual for which the certification is issued.

1.05 IDENTIFICATION

- A. *Cable labels shall be placed on both ends of all cables.*
- B. 1" white nylon with black lettering cable labels.
- C. Labels containing a unique cable number shall be placed on both ends of all cables, 6 inches from the termination and/or terminal block. (See the Cal Poly ITS Telecomm group Labeling, Design and Syntax Standard in Appendix B)
- D. *Subsequent to placing and terminating cables, the Contractor shall place the appropriate cable label on all cables as defined above.*
- E. *If at any time during the job the cable label becomes illegible or removed for whatever reason, the Contractor shall immediately replace it with a duplicate pre-printed cable label at the Contractor's expense.*
- F. *All cable labels shall be easily accessible, both physically and visually, upon completion of the job.*
- G. 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.
- B. All components used in horizontal cabling systems shall be warranted for a minimum period of 20 years from the date of installation against defects in materials, equipment and workmanship. This warranty shall also include the performance of these systems. This warranty shall include transmission requirements as specified in applicable ANSI/TIA/EIA/IEC/ISO standards for each cable system specified. This warranty shall also include all current and future applications designed for and available for each cable system.
 - 1. Warranty shall be guaranteed by a single reputable manufacturer:
 - a. AMP, Inc. or Cal Poly ITS Telecomm group approved equal

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 shall not be permitted, unless specifically noted otherwise.

2.02 COPPER STATION CABLES – GENERAL

- A. Cable jacket marking: Must be legible and shall contain the following information:
 - 1. Manufacturer's name and/or trade mark
 - 2. Copper Conductor Gauge
 - 3. Pair Count
 - 4. UL listing

5. Category rating
6. Sequential distance markings, in one foot increments

2.03 CAT 6 HORIZONTAL CABLE

- A. UTP Station Cable for voice and data: 4 unshielded twisted pairs of 23 AWG solid copper conductors. Individually insulated conductors under a common sheath.
- B. **Cable must be plenum rated.**
- C. Cable must meet requirements for Category 6 of ANSI/TIA/EIA-568
- D. Station cable jacket shall be **white**.
- E. Approved Manufacturers: Commscope, Belden, Hitachi, AMP, Belkin or Cal Poly ITS Telecomm group approved equal

PART 3 – EXECUTION

3.01 GENERAL

- A. Location and placement of termination blocks, patch panels and other distribution hardware shall be shown on the Drawings or defined therein.
- B. All cross-connects shall be installed by the Cal Poly ITS Telecomm group after all station cable test reports have been reviewed and approved.
- C. **Station cable shall be designed and installed such that the installed length (Permanent Link) is a maximum of 290 feet from faceplate to the patch panel in the ER/TR. (See Fig. #161 in Appendix B)**

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. The Contractor shall install each cable as an uninterrupted conductor section between the designated termination points, unless otherwise directed by the cable installation specifications. There shall be no splices or mechanical couplers installed between the cable points of origin and termination.
- B. Unless otherwise noted, all cables shall be routed through the building ITS Telecomm cable tray or conduit.
- C. All horizontal cables shall be plenum rated except where run under the slab or exposed to moisture. Cables run under the slab or exposed to moisture shall be OSP cable, see 27-13-14 for more details.
- D. **Non-telecomm cable runs shall not be tie-wrapped to any Structured Cable System supporting devices (including cable trays, wire basket, conduit, etc.), except when supported by ladder racking within the EF/TR/ER.**
- E. At the same time cable is pulled into a pathway, also install a pull string to facilitate future cable pulls.
 1. Pull string shall be nylon with 210 lb. pulling tension. Pull string is to be tied off at each end.

- F. Install station cabling, faceplates and jacks as detailed in the Specifications and Drawings. The typical configuration for faceplates shall be three unshielded twisted pair (UTP) cables of 4 pairs each, in non-residential spaces unless otherwise noted. **Structured cable shall be terminated to a jack or plug of the proper Category using the 568A termination standard.** (See the Cal Poly ITS Telecomm Labeling, Design & Syntax Standards in Appendix B)
- G. Non Typical Station Outlets:
 - 1. Security Cameras, Wireless Access Point Locations, Wall Phones, Card Access Devices, Key Boxes and other special use outlets/faceplates shall require differing quantities of station cables, have different termination requirements and shall require approval in writing in advance by the Cal Poly ITS Telecomm group.
 - 2. See section 27-15-43 for termination details, and see Drawings for specific location details.
- H. **Terminate all four pairs of each cable on one faceplate 8p8c jack.**
- I. Leave 15" of slack for each cable measured from the face of the wall, at each jack location.
- J. Leave 6" of slack at any transition or pull point to maintain cable bend radius, and prevent damage to the cable.
- K. Leave 12" of slack for the pull string at the faceplate end, and 36" of slack at the far end of the pathway.
- L. Cable Termination
 - 1. Station cable shall terminate in a specific EF/TR/ER designated on the Drawings to serve that location.
 - 2. Station cable shall terminate on the proper distribution panel in the appropriate TR/ER equipment rack.
 - 3. Leave a minimum of 6" of slack for each cable at the point of termination.
 - 4. Maintain pair twists of Station cable up to the point of termination. Under no circumstances shall cable pairs be untwisted or otherwise altered prior to termination.
 - 5. Do not bend Station cables to a radius of less than four (4) times the cable diameter.
 - 6. Cabling installation shall meet all manufacturer's written instructions.
 - 7. See Specification Section 27-11-19 for more detail on patch panel terminations.

3.04 GROUNDING & BONDING

- A. N/A
- B. 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. Upon receipt of the Contractor's documentation of testing, Cal Poly ITS Telecomm group representatives will review/observe the installation and may randomly request tests of the cables/wires installed. Once the installation and testing has been completed and the Cal Poly ITS Telecomm group representative is satisfied that all work is in accordance with the Contract

Documents, the representative will notify the Contractor and/or Cal Poly 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 Station cabling. Drawings shall include identifying information from the cable identification labels.

END OF SECTION

DOCUMENT VERSION CONTROL

REVISION	DATE	AUTHOR	REASON
1	02/20/2014	R. VOLK	INITIAL DOCUMENT RECREATION
	02/20/2014	DW&MH	PRIMARY REVIEW COMPLETE