

SECTION 27-15-14 AUDIO VISUAL STATION CABLES

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 Category 6 unshielded twisted pair Station/Structured Cabling System with all cables, termination hardware, outlets and necessary installation and supporting hardware in accordance with the strictest manufacturer written recommendation, Specification, and Cal Poly ITS Telecomm group, Telecommunications Standards Document.

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 Telecomm group, Telecommunications Standards Document (TSD) 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 all cables.
- B. Cable labels shall be 1" white nylon with black lettering.
- 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.
- D. Subsequent to placing and terminating cables, the Contractor shall place the appropriate cable label as noted 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 and both physically and visually accessible, upon completion of the job.
- G. Refer to Section 27-05-53 for additional details.

1.06 DEFINITIONS

- A. ***The Cal Poly ITS Telecomm group is an entity that is part of Enterprise Systems and reports to the Chief Information Officer (CIO). Classroom Technologies is an entity separate from ITS Telecomm but is also part of Enterprise Systems. Any work discussed in this document only relates to the ITS Telecomm portion of any project and our network support of Audio-Visual Cabling. Refer to Classroom Technologies' Standards Documents for information and direction regarding all other work in the area of Classroom Technology at <http://www.MDS.calpoly.edu>.***

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 such as a.AMP, Inc. or a 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 6A of ANSI/TIA/EIA-568
- D. Station cable jacket shall be green.
- 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. Cross-connects shall be installed by the Cal Poly ITS Telecomm group after the horizontal cable test reports have been reviewed and accepted by the Cal Poly ITS Telecomm group.
- C. Ethernet Station Cables for Audio Visual use are to be designed and installed so that the installed length (Permanent Link) is a maximum of 290 feet from jack to jack. **(See Fig. #161 in Appendix B)**

3.02 QUANTITIES

- A. Quantities of system elements shown on the drawings shall be illustrative only and shall 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 telecomm cable tray or conduit in each building.
- 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 supporting devices (including cable trays, wire basket, conduit, etc.).
- 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 shall be tied off at each end.

- F. Terminate all four pairs of each cable on one outlet jack.
- G. Leave 12" of slack for each cable measured from the face of the wall, at each jack location.
- H. Leave 6" of slack at any transition or pull point to maintain cable bend radius, and prevent damage to the cable.
- I. Leave 12" of slack for the pull string at the faceplate end, and 36" of slack at the far end of the pathway.
- J. Cable Termination.
 - 1. Station cabling for audio/video outlets shall be installed point to point between AV device locations as designated on the Drawings. ITS Telecom faceplate jacks shall be the "demark" connection location for Classroom Technology to gain access to the Ethernet. **(See Fig. #166 & 167 in Appendix B)**
 - 2. Leave 6" of slack for each cable at the point of termination.
 - 3. Maintain pair twists of Horizontal cable up to within 1/2 inch of the point of termination. Under no circumstances shall cable pairs be untwisted or otherwise altered prior to termination.
 - 4. Do not bend horizontal cables to a radius of less than four (4) times the cable diameter.
 - 5. Cabling installation shall meet all manufacturer's written instructions.

3.04 INSTALLATION FOR DIRECT CONNECTION TO USER EQUIPMENT (STATION END DEMARK)

- A. *In-wall installations connecting to non-telecomm equipment in rooms with hung ceilings and requiring a direct, permanent, inaccessible connection to the Ethernet shall be connected as follows: (See Fig. #167 in Appendix B)*
 - 1. **All structured cable shall be terminated using an 8p8c modular jack (termination) in a standard faceplate, mounted in its own 4 11/16" square, 2 1/4" deep back box.**
 - 2. **A "sheppard's hook", 1 1/4" conduit shall run from the back box to the area above the hung ceiling in the user's space.**
 - 3. **A similar conduit and back box shall be installed at the location required by the end user.**
 - 4. **In the ITS Telecomm back box (demark location), one (up to 4) jack(s) shall be "pushed back" into the back box and the empty "hole" created shall be filled with an appropriately colored "snap-in" blank.**
 - 5. **An ITS Telecomm group technician (only) shall plug the user extension cable into the jack and run cable to the area above the hung ceiling. There the cable will be coiled and left for the end user.**
 - 6. **The end user shall, using proper wire installation techniques as stated in the Cal Poly TSD, EIA/TIA and BICSI Standards, run the cable to the required locations and connect to their equipment.**
 - 7. **The end user provided jumper cable connecting to their equipment shall be identified cable using the ITS Telecomm faceplate port designation and number (at minimum) for that cable. A 1" wide white (with black ink), nylon, machine generated label, incorporating the identical information at both ends, shall be attached. (See Fig. #107 & #167 in Appendix B)**

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 test documentation, the Cal Poly ITS Telecomm group representatives shall review/observe the installation and may randomly request the testing of certain installed cables/wires. Once the installation, testing and review have been completed and the Cal Poly ITS Telecomm group representative is satisfied that all work is in accordance with the Contract Documents, the representative shall 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 horizontal 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 DEVELOPMENT
	02/20/2014	DW&MH	PRIMARY REVIEW COMPLETE