SECTION 27 13 14

COMMUNICATIONS COPPER OSP CABELING

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.

2. Horizontal station cable where installed in a damp and/or wet location.

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 must 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. RUS Specifications/REA Bulletins

D. National Electrical Safety Code (NESC)

E. NEC Codes

F. EIA/TIA/ANSI Telecommunication Standards

G. Must meet all requirements for easements and right-of-ways for the authority having jurisdiction.

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 telecommunications entrance facility and the main telecommunications rooms with pair counts by each wiring block.

3. Shop drawings shall include butterfly drawings showing cable routing through each vault.

4. Prior to placement of cable, Contractor shall submit to the University a comprehensive cable pulling plan. The plan shall consist of duct bank assignments, identification of anticipated pulling point setups, and durations for coordination of other ongoing campus activities.

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.

2. Submit manufacturer’s electrical specifications cut-sheet for each product with test results.

1.05 IDENTIFICATION

A. Copper OSP cabling must be labeled with 1¼” stamped brass tags within 18” of all conduit endpoints, and on each cable endpoint. Within all underground structures, 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 should 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. Non-hygroscopic core wrap.

E. The insulation of the tip conductor shall be marked with a stripe of the mating ring insulation color.

F. Manufacturer/Product: Superior Essex Sealpic-FSF RDUP PE.89 Part#: 09-069-02-xx (xx = pair count)

2.03 COPPER OSP CABLE (CATEGORY 6A STATION CABLE)

A. Cable should be Category 6A UTP Cable, outdoor rated, flooded gel, black jacket, 4 pair count.

B. Specified Product: Commscope Part # 1592A BK 4/24 R1000.
2.04 COPPER OSP CABLE (CATEGORY 3 SMALL PAIR COUNT DISTRIBUTION CABLE)

A. Cable should be Category 3 UTP Cable, outdoor rated, black jacket with a rip cord, 6 pair count.
B. Cable shall be suitable for direct burial, gel filled, with an aluminum shield.
C. Non-hygroscopic core wrap.
D. The insulation of the tip conductor shall be marked with a stripe of the mating ring insulation color.
E. Specified Product: Superior Essex Part #: 25-680-86

2.05 SHIELD BOND CONNECTOR FOR OSP CABLE

A. Connector shall be a stable, low-resistance electrical connection between the shield of a communications cable and a conductor.
B. Designed for use with all fiber and copper closures.
C. Suitable for fiber and copper underground applications.
D. Shall include short stud, protective shoe and flanged nut.
E. Specified Product: 3M™ Scotchlok™ Shield Bond Connector 4460-DS-SS
PART 3 – EXECUTION

3.01 GENERAL

A. Location and placement of termination blocks shall only be located in designated telecommunications spaces, wall cabinets, or on wall fields.

B. Any location that places the cable in an environment that is likely to come in contact with direct sunlight or water must use cabling approved for that environment.

C. Any location where the pathway extends beyond the envelope of the building shall require the use of OSP cable. In these instances install continuous conduit from location to designated telecom room.

D. Splices, other than in telecommunications rooms, are not permitted.

E. Do not install cross-connects until after the cable test reports have been accepted by the campus telecommunications representative.

3.02 QUANTITIES

A. Quantities of system elements shown on the drawings are illustrative only and are meant to indicate the general configuration of the work. The Contractor is 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. Install OSP cables in accordance with manufacturer’s published installation guidelines.

3. All OSP cables will 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 telecommunications rooms.

4. OSP cables terminating at an outside endpoint are required to have a primary entrance protector covering all pairs, including spares and must be terminated on protector panels in a telecommunications room or entrance facility.

5. OSP cables running on ladder racking within a telecommunications room shall be neatly placed and lashed to the horizontal and vertical ladder racking with cable 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 those pathways. Pull rope to be nylon ¼” 600 lb. pulling tension.

7. Observe all manufacturer’s 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 the point of termination.
   2. Under no circumstances shall cable pairs be untwisted or otherwise altered prior to termination.
   3. All terminations will follow industry standard uniform color codes.

C. Gel Sealant
   1. All gel filled cables will require use of a gel blocking sealant at any point that the gel is exposed.
   2. Follow all manufacturer’s 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 11 13 for Splice Case details.
   D. 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 must meet requirements for the whole of the installation to be accepted.
   B. For multi-pair cables of 100 pairs or more, a failure rate of no more than 2% shall be accepted.
   C. Upon receipt of the Contractor’s documentation of cable testing, the campus telecommunications representative will 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 will notify the Contractor and/or campus project manager in writing or via email.

3.07 RECORD (ASBUILT) DRAWINGS
   A. The Project Record Drawings shall show the types and locations of all OSP cabling, and all OSP termination points. Drawings should include identifying information from the cable identification tags.
   B. Provided documentation shall include butterfly drawings for each vault, detailing specific conduit utilization for each cable.

END OF SECTION
## DOCUMENT VERSION CONTROL

<table>
<thead>
<tr>
<th>REVISION</th>
<th>DATE</th>
<th>AUTHOR</th>
<th>REASON</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>08/07/2012</td>
<td>C. WHITEHOUSE</td>
<td>INITIAL DOCUMENT CREATION</td>
</tr>
<tr>
<td>2</td>
<td>02/12/2013</td>
<td>CJW &amp; CLC</td>
<td>PRIMARY REVIEW COMPLETE</td>
</tr>
<tr>
<td>3</td>
<td>11/30/2017</td>
<td>MAS &amp; CLC</td>
<td>2017 REVIEW COMPLETE</td>
</tr>
</tbody>
</table>