SECTION 27 13 24

COMMUNICATIONS OPTICAL FIBER 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. OSP optical fiber backbone cabling system.

2. OSP optical fiber distribution cabling.

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)

1.04 SUBMITTALS

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

B. Shop Drawings:

1. Shop drawings shall show the locations where cables are to be routed and where terminating hardware is to be installed.

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.

1.05 IDENTIFICATION
A. Outdoor cables must be labeled with 1¼" stamped brass tags 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. CMP: Communications Plenum Cable
B. CMR: Communications Riser Cable
C. MPP: Multipurpose Plenum Cable
D. OFNP: Optical Fiber Nonconductive Plenum Cable
E. OFCP: Optical Fiber Conductive Plenum Cable
F. LSZR: Low Smoke Zero Halogen Rated Cable
G. OM1: Defined by ISO 11801 & TIA-492-AAAA, 62.5/125 μm multimode fiber.

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.

2.02 FIBER OPTIC CABLES – GENERAL

A. Cable jacket marking: Must be legible and shall contain the following information:
   1. Manufacturer's name and/or trade mark
   2. Strand count
   3. Cable Type
   4. UL listing
   5. Sequential distance markings, in one foot increments

B. All multimode shall be OM4, 50 μm multimode fiber.

C. All singlemode shall be zero water peak singlemode fiber.

2.03 MULTIMODE OPTICAL FIBER OSP CABLE (36 STRAND)

A. Non-Armored Jacket shall be MDPE, with strength elements and zipcord immediately underneath.

B. Internal structure shall include water swellable tape layer and 2.5 mm Gel-Free buffer tubes.

C. Fibers shall be contained in loose tube construction surrounding a central dielectric strength member.

D. Shall be 12 strands per subunit, 36 multimode fibers in one overall jacket.

E. Jacket color shall be black.

F. Manufacturer/Product: Commscope Part #: D-036-LN-5K-F12NS

2.04 SINGLEMODE OPTICAL FIBER OSP CABLE (144 STRAND)

A. Non-Armored Jacket shall be MDPE, with strength elements and zipcord immediately underneath.

B. Internal structure shall include water swellable tape layer and 2.5 mm Gel-Free buffer tubes.

C. Fibers shall be contained in loose tube construction surrounding a central dielectric strength member.

D. Shall be 12 strands per subunit, 144 singlemode fibers in one overall jacket.

E. Jacket color shall be black.

F. Manufacturer/Product: Commscope Part #: D-144-LN-8W-F12NS
2.05 COMPOSITE OPTICAL FIBER OSP CABLE (36/36)
   A. Non-Armored Jacket shall be MDPE, with strength elements and zipcord immediately underneath.
   B. Internal structure shall include water swellable tape layer and 2.5 mm Gel-Free buffer tubes.
   C. Fibers shall be contained in loose tube construction surrounding a central dielectric strength member.
   D. Shall be composite cable, 12 strands per subunit, 36 singlemode and 36 multimode fibers in one jacket.
   E. Jacket color shall be black.
   F. Manufacturer/Product: Commscope Part #: D-072-LN-CM-F12NS/8W036/5K036

2.06 COMPOSITE OPTICAL FIBER INDOOR/OUTDOOR CABLE (12/12)
   A. Non-Armored Jacket shall be plenum and OSP rated.
   B. Cable shall have strength elements and zipcord immediately underneath jacket.
   C. Internal structure shall include water swellable tape layer and 2.5 mm gel-free buffer tubes.
   D. Fibers shall be contained in loose tube construction surrounding a central dielectric strength member.
   E. Shall be composite cable, 12 strands per subunit, 12 singlemode and 12 multimode fibers in one jacket.
   F. Jacket color shall be black.
   G. Manufacturer/Product: Commscope Part #: P-024-LN-CM-F12BK/25D/8W012/5K012

2.07 MULTIMODE OPTICAL FIBER INDOOR/OUTDOOR CABLE (6 STRAND)
   A. Non-Armored Jacket shall be plenum and OSP rated.
   B. Cable shall have aramid yarn and zipcord immediately underneath jacket.
   C. Internal structure shall include water barrier layer and a central dielectric strength member.
   D. Jacket color shall be black.
   E. Manufacturer/Product: Commscope Part #: P-006-OD-5K-FSUBK

2.08 SINGLEMODE OPTICAL FIBER INDOOR/OUTDOOR CABLE (6 STRAND)
   A. Non-Armored Jacket shall be plenum and OSP rated.
   B. Cable shall have aramid yarn and zipcord immediately underneath jacket.
   C. Internal structure shall include water barrier layer and a central dielectric strength member.
   D. Jacket color shall be black.
E. Manufacturer/Product: Commscope Part #: P-006-OD-8W-FSUBK
PART 3 – EXECUTION

3.01 GENERAL

A. OSP fiber optic cables are for use between telecommunications facilities in different buildings, or any connections that are subject to moisture.

B. Location, fiber count and placement detail for all fiber optic cables shall be as shown on the Drawings.

C. OSP cable will be run in continuous rigid metallic conduit or underground until it is exposed in a telecommunications space where it is to be terminated.

D. Provide 50' slack loops at the TR end of all OSP fiber optic cables over 12 strands. OSP fiber optic cables under 12 strands shall have 20' slack loops.

E. Provide 36" of stripped fiber strands wrapped neatly at each fiber cabinet.

F. Insure all fiber optic cables as installed are not subject to strain, and that correct bend radiiuses are maintained at all times.

G. Do not combine terminations of fiber optic cables leading to different endpoints into a single cabinet. Each distribution, riser, OSP or Fire Alarm serving cable shall require their own, dedicated fiber termination cabinet. The only exception is for station fibers, termination of station fibers can be combined into a single cabinet.

H. Each fiber optic OSP cable shall be placed within one cell of innerduct per Section 27-05-33.

I. Fiber optic cables and copper cables shall not share conduit or innerduct.

J. Do not terminate fiber or place fiber termination hardware in telecommunication spaces until rooms are completely clean, dust free, and kept in that state until accepted by the building owners.

K. Do not terminate fiber until after the rack locations and elevations of fiber cabinets have been accepted by the campus telecommunications representative.

L. Do not install patch cables until after the fiber optic 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. Optical Fiber OSP Cables:

1. Provide support for vertical runs of fiber optic riser cables.

2. Route fiber optic cables over telecom ladder racking avoiding the area directly in front of the wallfield.

3. Route fiber optic cables together as a single bundle, not to be combined with copper or coax cabling.
4. Installation of all fiber optic cables shall require the use of a breakaway swivel rated to the cable manufacturer's written specifications for pull strength.

5. Follow all manufacturers' specifications for installation.

B. Connector Installation

1. Both ends of each fiber shall be fusion spliced to a factory made LC to Unconnectorized, Fiber Pigtail.

2. Maximum length deferential between terminated strands per bundle shall be 6”. If the length does not meet this requirement the entire bundle must be re-terminated.

C. Slack Loop

1. A 20' slack loop shall be left at each end of the cable.

2. Slack loop shall be mounted on the wall, above ladder rack height.

3. Slack loop shall be located within Telecommunication Rooms.

4. Slack loop location shall be designated by the campus telecommunications representative.

D. Underground

1. OSP fiber optic cables need to be lashed to and supported by cable management arms within any underground facilities.

2. Outdoor cables must be labeled with 1½" stamped brass tags at each location within 12" of where it enters and exits in each underground facility.

3. At each vault immediately prior to building entry, each fiber optic OSP cable shall make one complete horizontal wrap of the vault.

3.04 GROUNDING & BONDING

A. None Required

3.05 TESTING

A. Refer to Specification Section 27 08 23.

3.06 ACCEPTANCE

A. 100% of the fiber tested must meet requirements for the whole of the fiber installation to be accepted.

B. Upon receipt of the Contractor's documentation of cable testing, the campus representative will review/observe the installation and randomly request tests of the cables 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 fiber optic cabling and fiber optic 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**

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