SECTION 27 11 20

COMMUNICATIONS FIBER CABINETS, ADAPTERS AND CONNECTORS

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. Telecommunications room fiber optic termination system complete with all necessary installation 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 must hold a current manufacturer’s certification for each individual component they install.

1.03 CODES AND STANDARDS

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. ANSI/TIA-568-C.3

1.04 SUBMITTALS

A. Also refer to Section 27 00 00.

B. Shop Drawings:

1. Shop drawings shall show the locations of fiber optic terminations and the end location of the cables that will be terminated on them.

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. Fiber Cabinets are to be labeled with ½” white permanent polyester with black labeling. Detail is to be provided by a campus telecommunications representative.
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.

2.02 FIBER OPTIC TERMINATION CABINET (RACK MOUNT)

A. Constructed of steel with black powder coat finish.

B. Cabinets shall be fully enclosed rack mountable (19" or 23") cable management type patch cabinets.

C. Cabinets shall have a latching Plexiglas front panel. Labeling and connectors shall be clearly visible with front panel open or closed.

D. Cabinets shall be modular and accept a variety of inter-changeable bulkheads, but shall be equipped with LC bulkheads.

E. Cabinets shall be equipped with multiple splice tray organizers.

F. Cabinets shall be equipped with a sliding shelf.

G. Panels shall have an integrated front cable management trough.

H. Trays and modules shall provide a means to avoid exceeding the cable manufacturer’s minimum bending radius to protect against crimping or over bending.

I. Full rubber grommets for dust protection at all cable entry and exit points.

J. Knockouts for strain relief fittings.

K. Cabinets shall provide accommodation for optical fiber splice trays and terminations.

L. Manufacturer/Product: COMMSCOPE SYSTIMAX Part #: HD-2U-SP (2RU, Up To 72 LC Connections)

M. Manufacturer/Product: COMMSCOPE SYSTIMAX Part #: HD-4U-SP (4RU, Up To 144 LC Connections)

2.03 FIBER OPTIC TERMINATION CABINET FOR HARSH ENVIRONMENTS (WALL MOUNT)

A. Constructed of steel with black powder coat finish.

B. Accommodates snap-in adapter plates and cassette modules.

C. Lockable hinged door.

D. Two-tier fiber storage hoops for fiber management.

E. Top and bottom accesses have cable tie-downs/strain relief fittings.
F. Cabinets shall be equipped with multiple splice tray organizers.

G. Manufacturer/Product: COMMSCOPE SYSTIMAX Part #: WBE-EMT-BK-2P-MOD

2.04 FIBER OPTIC TERMINATION CABINET FOR SPACE CONSTRAINED TERMINATION

A. Constructed of 16 gauge steel with black powder coat finish

B. Accommodates snap-in adapter plates

C. Lockable hinged door

D. Top and bottom accesses have cable tie-downs/strain relief and full grommets

E. Manufacturer/Product: OCC Part #: ZDMB6B

2.05 ADAPTER PANELS FOR SPACE CONSTRAINED CABINETS

A. Adapters shall have ceramic alignment sleeves for singlemode and phosphor bronze sleeves for multimode.

B. Adapters shall be removable from the front of the cabinet, and shall be of a tool-less design.

C. Dust caps are to be provided for every connector

D. Unless otherwise noted, all shall be type 568 LC as defined in ANSI/TIA/EIA-568.

E. Maximum insertion loss across mated pair: less than .5db.

F. Manufacturer/Product: OCC Part #: 6112SMDLC (12 Port Singlemode)

G. Manufacturer/Product: OCC Part #: 6112DLC50G (12 Port 50µ Multimode)

2.06 ADAPTER PANELS FOR RACK MOUNT AND WALL MOUNT CABINETS

A. Adapters shall have duplex LC interfaces in the front and standard LC interfaces in the rear.

B. Adapter panels shall have transparent shutters.

C. Snap-in tool-less design.

D. Adapter panels shall be available in Blue for Singlemode and Aqua for Multimode.

E. Available in 12 or 24 ports.

F. Manufacturer/Product: COMMSCOPE SYSTIMAX Part #: 360DPis-12LC-SM (Singlemode)

G. Manufacturer/Product: COMMSCOPE SYSTIMAX Part #: 360DPis-12LC-MM (Multimode)

2.07 FUSION SPLICE TRAYS FOR CABINETS UP TO 72 LC CONNECTIONS OR 2RU

A. Multiple Splice organizer management system shall include fusion splice trays, mounting base, hardware, and optimized to utilize predrilled holes in fiber cabinets.
B. Pivoting Trays.

C. Fusion splice trays shall be removable but securely latched when installed.

D. Hardware in splice tray quantities shall be configured for the known requirements. Each subunit count will terminate in a single splice tray.

E. Manufacturer/Product: COMMSCOPE SYSTIMAX Part #: RS-2AF-16SF (1RU Cabinets)

F. Manufacturer/Product: COMMSCOPE SYSTIMAX Part #: RS-4AF-16SF (2RU Cabinets)

**2.08 FUSION SPLICE TRAYS FOR CABINETS UP TO 144 LC CONNECTIONS OR 4RU**

A. Multiple Splice organizer management system shall include fusion splice trays, mounting base, and designed specifically to fit.

B. Pivoting Trays.

C. Hardware in splice tray quantities shall be configured for the known requirements. Each subunit count will terminate in a single splice tray.

D. Manufacturer/Product: COMMSCOPE SYSTIMAX Part #: SW-6AF-16SF (4RU Cabinets)

**2.09 FUSION SPLICE SLEEVES**

A. Shall provide mechanical and environmental protection for fusion splices.

B. Hot melt adhesive with short installation cycle and compatible with most common ovens.

C. Transparent heat shrinkable tube.

D. Manufactured with a stainless steel rod.

E. Designed to fit COMMSCOPE SYSTIMAX RoloSplice Trays and Wallets.

**2.10 FUSION SPLICE PIGTAILS SINGLEMODE**


B. Factory terminated blue LC connectors to unconnectorized fiber pigtails 36” in length.

C. Shall be of 0.9 mm Tight Buffer design.

D. Shall be of a 12-fiber subunit kit containing standard 12 unit color code with overall jacket.

E. Manufacturer/Product: COMMSCOPE SYSTIMAX Part# FAWL3UC0C-XXF003

**2.11 FUSION SPLICE PIGTAILS MULTIMODE**

A. Shall be OM4.

B. Factory terminated aqua LC connectors to unconnectorized fiber pigtails 36” in length.
C. Shall be of 0.9 mm Tight Buffer design.

D. Shall be of a 12-fiber subunit kit containing standard 12 unit color code with overall jacket.

E. Manufacturer/Product: COMMSCOPE SYSTIMAX Part# FAXL8UC0C-XXF003

2.12 CONNECTORS (BREAK OUT FIBER, ST, FACP END ONLY)

A. Connectors should be field installable and designed for break out fiber.

B. Kit will consist of 2mm crimp ring, 2mm strain relief boot, and ST connector.

C. Anaerobic connectors shall be required.

D. Maximum insertion loss across mated pair: less than .5db.

E. Manufacturer/Product: OCC Part#: AFC-ST5G-2MM-AQU

2.13 CONNECTORS (BREAK OUT FIBER, LC)

A. Connectors should be field installable and designed for break out fiber.

B. Kit will consist of 2mm crimp ring, 2mm strain relief boot, and LC connector.

C. Anaerobic connectors shall be required.

D. Maximum insertion loss across mated pair: less than .5db.

E. Manufacturer/Product: OCC Part#: AFC-LC5G-2MM-AQU

2.14 FIBER FUSION SPLICE CASE W/ SPLICE TRAYS (OSP TO RISER FIBER)

A. No special tools required.

B. Reenterable mechanical cable and O-ring equipped closure sealing system.

C. Single-ended, O-ring sealed dome closure for splicing feeder and distribution cables.

D. Multiple expandable gel sealing split grommets, and wide opening cable ports.

E. Range of cable sizes accepted.

F. Accepts COMMSCOPE SYSTIMAX Part# FOSC-ACC-SM12-MODULES fusion splice trays.

G. Manufacturer/Product: COMMSCOPE SYSTIMAX Part#: FOSC450-BS-6-NT-0-B0V
PART 3 – EXECUTION

3.01 GENERAL

A. The Contractor shall place all optical fiber backbone cabling in accordance with these specifications, and as indicated on the cable schedules and the Drawings.

B. Rack mounted cabinets are to be used in telecom rooms, wall mounted cabinets are to be used outside of telecom rooms.

C. Provide 50’ slack loops at the TR end of all OSP cables over 12 strands, and 20’ slack loops at the TR end of all other cables.

D. Provide 36” of stripped fiber wrapped neatly at each fiber cabinet.

E. Provide 24” of stripped fiber at the outlet end of any station fiber.

F. All fiber terminations are to utilize color coded (blue for singlemode and aqua for multimode) duplex LC connectors unless otherwise noted.

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. Termination of fiber optic cables for use by the Fire Alarm System are to be terminated on the TR end in a dedicated cabinet. Termination of fiber for the FACP end of the cable may be done directly in the fire alarm panel.

I. 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. Cabinets

1. Rack location details (including elevation) for fiber cabinet mounting are to be approved by a campus telecommunications representative prior to installation.

2. After dressing the cable to its final destination, sheath shall be removed to a point that allows the optical fiber strands to be splayed and terminated in a neat and uniform fashion.

3. All cabinets shall employ factory provided, appropriately sized grommets for all openings.

4. All unused adapter openings shall be filled with blank plates.

B. Connectors

1. Both ends of each fiber shall be fusion spliced to a factory made LC to Unconnectorized, Fiber Pigtail
terminated in strict compliance with the manufacturer's printed instructions.

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. Fiber Optic Splices

1. Where splicing is indicated, all optical fiber cable splicing shall be fusion spliced.

2. Fiber optic cables are never to be spliced in any outside or underground structure.

3. Only one type of fiber (SM or MM) shall occupy each individual fiber splice tray.

4. Mount splice case so it is fully supported on the wall, and available at a working height.

5. Maintain sufficient slack to enable splice case to be removed from the wall for service.

3.04 GROUNDING & BONDING

A. Any use of armored cable shall require the bonding of that shield to the TGB/TMGB with a #6 AWG copper bonding conductor.

B. Refer to Section 27 05 26 for additional details.

3.05 TESTING

A. Refer to Specification Section 27 08 23.

3.06 ACCEPTANCE

A. Cabinet must be labeled per specifications.

B. 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. None Required.

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