

271323 – COMMUNICATIONS OPTICAL FIBER INTRABUILDING BACKBONE CABLING

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 27 00 00: Communications General.
- B. Section 33 82 23: Optical Fiber Communications Distribution Cabling.

1.2 REFERENCES

- A. NFPA 70 - National Electrical Code; National Fire Protection Association; 2002.

1.3 DEFINITIONS

- A. See Section 27 00 00: Communications General.

1.4 DESIGN REQUIREMENTS

- A. The Information Transport System backbone cabling system shall be designed to conform to the requirements of ANSI/EIA/TIA-568-B. In conformance with this standard, the cabling system shall be designed in a hierarchical star topology.
- B. The preferred fiber cable is Corning MIC optical fiber cable. This cable shall be armored or shall be routing in conduit, innerduct or steel raceway. Substitutions to this cable shall be pre-approved by the Owner. Submit all specifications for substitution candidate to the Owner's contact prior to specification.
- C. Optical fiber cables shall meet or exceed all applicable national and local building fire code requirements. Fiber cables used in a return air plenum environment shall have an Underwriters Laboratories rating that meets or exceeds the requirements of NFPA 262-1985 and UL®-910. (OFNP) and (UL®) shall be printed every two (2) feet on the cable jacket. The optical fiber riser cable shall have an Underwriters Laboratories rating that meets or exceeds the requirements of UL®-1666 (OFNR) and (UL®) shall be printed every two (2) feet on the cable jacket.
- D. All optical fibers shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical and environmental requirements of this specification. The attenuation specification shall be a maximum attenuation for each fiber over the entire operating temperature range of the cable. No nominal values will be acceptable.
- E. Connections between any fiber optic patch panels shall be made with a pre-manufactured, fiber optic patch cord. All fiber optic jumper assemblies shall comply with the standards for both fiber optic cables and fiber optic connectors.
- F. Fiber shall be installed with strain relief as outlined by BISC1 methodologies.
- G. A service loop of 20 feet is required at each MDF and ER location. A service loop of 10 feet is required at all IDF locations. Service loops shall be neatly secured a minimum of eight feet above floor level on an adjacent wall within the communications room.
- H. Secure the cable to the cable tray using Velcro cable ties.

- I. Secure the cable to the wall to prevent horizontal movement of the cable (D-rings are acceptable). Secure the cables to the wall in a non-deforming manner to prevent vertical movement of the cable.
- J. Optical fiber intra-building backbone cables run entirely within stacked network rooms, within metallic conduit, or within innerduct can be unarmored. Otherwise, the cables shall be armored, including cables run in open raceways.
- K. Multi-Mode Fiber Characteristics
 - 1. All specified multi-mode fiber optic cable shall meet the following grade, attenuation and bandwidth characteristics.
 - a. 50/125 micron, OM4 grade, Graded Index
 - (1) 3.0 dB/km @ 850 nm Maximum attenuation
 - (2) 1.0 dB/km @ 1300nm Maximum attenuation
 - (3) 500 MHZ km @ 850nm Minimum bandwidth
 - (4) 500 MHZ km @ 1300nm Minimum bandwidth
- L. Single mode Fiber Characteristics
 - 1. All specified single-mode fiber optic cable shall meet the following grade, attenuation and bandwidth characteristics.
 - a. 8.3 to 9/125 micron
 - b. 1.0 dB/km @ 1310 nm and 1550nm Maximum attenuation
 - 2. The termination panels/connectors for single mode fiber shall be blue in color.
- M. Terminations and Connectors for Fiber Optic Cable
 - 1. Each strand of optical fiber cable shall be terminated with factory installed, LC connectors with field fuseable or Uni-cam pigtails. Terminate the fiber on a rack mounted patch panel.
 - 2. Typical loss shall not exceed 0.2 dB with a maximum loss of 0.4 dB per connector using LC type connectors. Durability shall not be less than 0.2 dB change over 100 rematings

PART 2 PRODUCTS

2.1 MATERIALS

- A. For all cables, specify plenum rated as required.
- B. Cable may be single mode-multimode hybrid cables where both fiber types are in a common outer sheath.
- C. Multimode, 50/125 micron, OM4 tight buffered, plenum:

1. Corning Cable Systems
 - a. Premise Distribution Tight Buffered, MIC, aqua
 - b. Premise Distribution Tight Buffered, MIC, interlocking armored, aqua
 2. Commscope/Systimax Cable Systems
 - a. Premise Distribution Tight Buffered, MIC, aqua
 - b. Premise Distribution Tight Buffered, MIC, interlocking armored, aqua
- D. Single mode, 9/125 micron, tight buffered, plenum:
1. Corning Cable Systems
 - a. Premise Distribution Tight Buffered, MIC, yellow
 - b. Premise Distribution Tight Buffered, MIC, interlocking armored, yellow
 2. Commscope/Systimax Cable Systems
 - a. Premise Distribution Tight Buffered, MIC, yellow'
 - b. Premise Distribution Tight Buffered, MIC, interlocking armored, yellow

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. In the MDF/IDF the Contractor shall provide at least 10 feet of cable in a wall mounted service loop just above the cable tray.
- C. In large telecommunications enclosures, the Contractor shall provide a service loop/coil of up to 10 feet as able to contain within the enclosure.
- D. The Contractor shall secure the cable to the cable tray using Velcro cable ties.
- E. The Contractor shall secure the cables to the wall to prevent horizontal movement of the cable (D-rings are acceptable). The Contractor shall secure the cables to the wall in a non-deforming manner to prevent vertical movement of the cable.
- F. The Contractor shall install fiber optic cable in conduit, cable tray or supported from building structure at 3 feet OC.
- G. All optical fiber cables are to be continuous and without splicing. Optical fiber based MUTOAs are not considered splices.
- H. Comply with manufacturers' recommendations regarding pulling tension and allowable lubricants.
- I. The Contractor shall be responsible for verifying actual footages and distances identified on

attached prints (i.e. wall-to-wall, pullbox-to-pullbox and ER to network room).

- J. The Contractor shall be responsible for verifying that conduits and raceways ready for occupancy before cable placement.
- K. The Contractor shall assume responsibility for difficulties or damage to cable during placement.
- L. Where fiber optic cable passes through vertical riser space or network rooms, secure fiber to wall vertically every 36 inches. Review fasteners, strain relief and routing with owner.
- M. The Contractor shall test and label all cables.

END OF SECTION 271323