**SECTION 27 13 23**
**COMMUNICATIONS OPTICAL FIBER BACKBONE CABLING**

**PART 1 – GENERAL**

**1.1 DESCRIPTION:**

A. This section specifies requirements for telecommunications optical fiber backbone cabling.

**1.2 SUMMARY**

A. Section Includes:

1. Multimode Optical Fiber Backbone Cables.
2. Single Mode Optical Fiber Backbone Cables.
3. Hybrid Optical Fiber Backbone Cables.

**1.3 REFERENCES**

A. VA Infrastructure Standard for Telecommunications Spaces.

**1.4 RELATED WORK:**

A. Computer room structured cabling: Section 27 10 00, STRUCTURED CABLING.

B. Termination equipment: Section 27 11 19, COMMUNICATIONS TERMINATION BLOCKS AND PATCH PANELS.

C. Cable labeling requirements: Section 27 05 53, IDENTIFICATION FOR COMMUNICATIONS SYSTEMS.

**1.5 SUBMITTALS:**

A. Submit in accordance with Section 27 05 00, COMMON WORK RESULTS FOR COMMUNICATIONS SYSTEMS.

**PART 2 – PRODUCTS**

**2.1 MULTIMODE OPTICAL FIBER BACKBONE CABLES.**

A. Multimode fiber optic backbone cables are specified for inside and outside plant use, for campus backbone (interbuilding and intrabuilding) use.

1. Performance Category. Laser-optimized OM4 cables are specified. Inside/outside rated cable is specified for applications where the pathway transits an outside plant path.
2. Testing. All fiber optic backbone media shall pass all Tier 1 requirements (attenuation with an Optical Loss Test Set or OLTS, verification of cable length and polarity) and all Tier 2 requirements (characterization by an Optical Time Domain

Reflectometer or OTDR resulting in indication of the uniformity of cable attenuation and connector insertion loss).

3. Termination. For computer room first level backbone usage, factory pre-terminated cables with MPO connectors are required. Fiber will be field terminated (fusion spliced) when used to connect the computer room to Telecommunications Rooms (TRs) and other telecommunications spaces.
   a. Polarity. For pre-terminated MPO-MPO cables, the polarity of the cables shall be matched to the type of fiber optic distribution cassettes specified.
4. Jacket Color.
   a. OM4. Aqua.
5 Jacket Rating. Communications Multipurpose Cable, Plenum (CMP) shall be specified if any portion of the cable passes through an NEC-defined plenum. Communications Multipurpose Cable, Riser (CMR) shall be specified for all other applications. CMP may be used as a substitute for CMR.
6. Bundling and Construction. Bundles consisting of multiples of sub-bundles (subunits) of 12 strands of fiber are specified. Cables shall be dielectric and tight-buffered. Inside/outside rated cable shall be dielectric and loose-tube. Construction shall match the rear entry requirements of the fiber optic distribution or splice cassette such that the sub-bundle (subunit) remains jacketed into the cassette.
7. Length. Backbone cabling for computer room first level backbone use (pre-terminated) shall be procured to the specific length required by the design (horizontal and vertical paths) with no more than 1 meter of excess length on each end.

**2.2 SINGLE MODE OPTICAL FIBER BACKBONE CABLES.**

A. Single mode fiber optic backbone cables are specified for inside and outside plant use, for campus backbone (interbuilding and intrabuilding) use.
   1. Performance Category. OS1 is specified for inside plant applications. Inside/outside rated OS2 is specified for applications where the pathway transits an outside plant path.

2. Testing. All fiber optic backbone media shall pass all Tier 1 requirements (attenuation with an Optical Loss Test Set or OLTS, verification of cable length and polarity) and all Tier 2 requirements (characterization by an Optical Time Domain Reflectometer or OTDR resulting in indication of the uniformity of cable attenuation and connector insertion loss).
3. Termination. Fiber will be field terminated (fusion spliced) when used to connect the computer room to Telecommunications Rooms (TRs) and other telecommunications spaces.
4. Jacket Color. Yellow.
5. Jacket Rating. Communications Multipurpose Cable, Plenum (CMP) shall be specified if any portion of the cable passes through an NEC-defined plenum. Communications Multipurpose Cable, Riser (CMR) shall be specified for all other applications. CMP may be used as a substitute for CMR.
6. Bundling and Construction. Bundles consisting of multiples of sub-bundles (subunits) of 12 strands of fiber are specified. Cables shall be dielectric and tight-buffered for OS1, and loose-tube gel-filled for OS2.

**2.3 HYBRID OPTICAL FIBER BACKBONE CABLES.**

A. Hybrid cables containing multiple 12-strand bundles (subunits) of multimode and/or single mode fiber are acceptable.

**PART 3 - EXECUTION**

**3.1 IMPLEMENTATION.**

A. All cabling and equipment shall be labeled per the requirements of the VA Infrastructure Standard for Telecommunications Spaces.
B. Interior to telecommunications spaces, install fiber optic backbone cabling in overhead cable tray and fiber raceway systems.

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