SECTION 17015
BACKBONE CABLEING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Facilities Management Design and Construction Guide, apply to this Section.

B. When included as a part of this specification, the following contain related requirements:

   1. Division 16 Section “General Electrical Requirements”.
   2. Division 16 Section “Basic Electrical Materials and Methods”.
   3. Division 16 Section “Grounding and Bonding”.
   4. Division 16 Section “Raceways and Boxes”.
   5. Division 16 Section “Cable Trays”.
   6. Division 17 Section “General Telecommunications Infrastructure Requirements”.
   7. Division 17 Section “Equipment Rooms, Telecommunications Rooms, and Service Entrances”.
   8. Division 17 Section “Horizontal Cabling”.
   9. Division 17 Section “Telecommunications Labeling”.
   10. Division 17 Section “Telecommunications Testing and Documentation”.

1.2 SUMMARY

A. This Section includes cable and installation for backbone cable systems to be used as signal pathways for voice and high-speed data transmission.

1.3 SUBMITTALS

A. Product Data: Include data on features, ratings, and performance for each component specified.

B. Cable Administration Drawings: As specified in Part 3.

C. Construction record drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Refer to Division 16 Section “General Telecommunications Infrastructure Requirements” for specific manufacturers.
2.2 SYSTEM REQUIREMENTS

A. General: Coordinate the features of materials and equipment so they form an integrated system. Match components and interconnections for optimum future performance.

B. Expansion Capability: Unless otherwise indicated, provide spare fibers and conductor pairs in cables to accommodate 20 percent future increase in active workstations.

2.3 TWISTED BACKBONE CABLES, CONNECTORS, AND TERMINAL EQUIPMENT

A. Cables: Listed as complying with Category 5e of TIA/EIA-568-B.

B. Conductors: Solid copper.

C. UTP Cable: See drawings for pair count, thermoplastic-insulated, individually twisted pairs of conductors; No. 24 AWG, color-coded; enclosed in PVC jacket.

D. UTP Plenum Cable: Listed for use in air handling spaces. Features are as specified for cables, conductors, and UTP cable, except materials are modified as required for listing.

E. Backbone Cables:

1. Voice:
   a. Type: UL Listed, Category as indicated on drawings.
   b. Conductors: 24 AWG, copper.
   c. Quantity of Pairs: as indicated on drawings.
   d. Shielding: none.
   e. Jacket Color: white.
   f. Refer to Drawings T001, Copper Schematic.

2.4 FIBER-OPTIC CABLES

A. Cables: Factory fabricated, tight buffered, jacketed, low loss, glass type, fiber optic cables, 125 micron cladding diameter.

B. Backbone, Strands per Cable: 12 singlemode, unless otherwise indicated. See detail drawings.


D. Operating Temperature Range: Minus 20 to plus 70 deg C.

E. Cable Types:

1. 8 Micron Core Diameter Single Mode Fiber:
   a. Maximum Attenuation: Minus 0.70 dB/km at 850 nm. minus 0.70 dB/km at 1300 nm.
   b. Minimum Modal Bandwidth: Not applicable.
2.5 FIBER OPTIC CONNECTORS
A. LC connectors with self-centering, axial alignment mechanisms. Insertion loss not more than 0.7 dB.

2.6 FIBER OPTIC SPLICE CASES AND SPLICES
A. Designed for the number of cables, size of cables, quantity of fiber strands, and environment of the splice location.
B. Able to be positioned either horizontally or vertically as indicated on the drawings.
C. Closures affect a complete splice closure system and include the manufacturer’s recommended hardware and parts for the splice type and environment including, but not limited to, end caps or covers, splice wrappers, flange seals, bond connectors and clamps, ground braids, alignment bars, lubricants, cover clips, external bond braids or ribbons, and cleaning kits.
D. Fiber Optic Splice Type: Fusion.

PART 3 - EXECUTION

3.1 APPLICATION OF MEDIA
A. Backbone Cable for Voice and Data Service: Use fiber-optic cable for runs between equipment rooms and telecommunications rooms and for runs between telecommunications rooms.

3.2 BACKBONE CABLES
A. Provide OFNP rated singlemode fiber optic cable in between the entrance facility and telecommunications rooms as indicated on drawings. Refer to drawings for specific strand counts.
B. Install cables in trays or as indicated on drawings.
C. Provide supports as required for vertical cable runs. Provide three supports per floor and a service loop or offset every three floors to allow for proper strain relief.
D. Where riser cables serving multiple telecommunications rooms pass through the same conduit sleeve or are mounted on the same backboard, separately bundle the cables serving each closet using commercially available wire ties.

3.3 GROUNDING
A. Comply with Division 16 Section "Grounding and Bonding."
3.4 OPTICAL FIBER BACKBONE CABLE INSTALLATION

A. Install all fiber optic backbone cables in innerduct. Install optical fiber cable after installation of the innerduct.

B. Provide continuous optical fiber cable from the telecom service room to the telecommunications room being served and between telecommunications rooms. Do not splice cables.

C. Install cable in accordance with the manufacturer’s specifications for installation and loading. Do not violate the short and long term cable loading.

D. Do not violate the manufacturer’s minimum bending radius for both loaded and unloaded conditions. Avoid cable wrinkling.

E. Replace damaged optical fiber cable with new material.

F. Provide a service loop of 20 feet at each end of each cable. Place the location of the service loop such that the cable can be extended without interference of other systems such as mechanical systems, electrical piping, plumbing, racking, etc. Wind the loop such that the cable enters the rack and distribution hardware with minimal bends. Store the loop out-of-way and fasten to the wall or ceiling to prevent possible damage. See detail drawings.

END OF SECTION 17015