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

1.2 SUMMARY

A. This Section includes wire, cable, connecting devices, installation, and testing for wiring systems to be used as signal pathways for voice and high-speed data transmission.

B. The horizontal cabling includes the installation of jacks, face plates, copper station cable, fiber optic station cable, distribution frame hardware, cross-connect hardware, station patch cords, and cable termination, and cutover.

C. Unit Pricing:

1. Provide unit pricing for the following work situations. Unit pricing shall include all material, labor, termination, labeling and activation for the described services. Keep unit pricing in effect until the Owner has final acceptance for the building. Submit unit pricing on bid documents.
   a. Unit Price 1: Cost to add or delete an additional voice or data jack to an existing location.
   b. Unit Price 2: Cost to add or delete a completely new voice or data outlet to a location.
   c. Unit Price 3: Cost to add or delete an additional CATV outlet to a location.
   d. Unit Price 4: Cost to add or delete an additional card reader to a location.
   e. Unit Price 5: Cost to add or delete an additional work area fiber cable.
1.3 SUBMITTALS
A. Product Data: Include data on features, ratings, and performance for each component specified.

1.4 COORDINATION
A. Coordinate with pathway installer to ensure that EIA/TIA distance limits and installation tolerances are maintained. Outlets that are beyond EIA/TIA distance shall be brought to the Owner/Engineer’s attention as soon as possible. Owner/Engineer shall not be responsible for outlets beyond distance limits as a result of incorrectly routed pathways.

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.

2.3 TWISTED-PAIR CABLES, CONNECTORS, AND TERMINAL EQUIPMENT
A. Cables: Listed as complying with Category 6 of TIA/EIA-568-B.
B. Conductors: Solid copper.
C. 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.
D. Copper Horizontal Cables (Station Cables):
   1. Category 6:
      a. Type: UTP, EIA/TIA Category 6
      b. Conductors: 24 AWG, copper
      c. Quantity of Pairs: 4
      d. Jacket: plenum rated
      e. Jacket Color: blue
      f. Manufacturer: Berk-Tek Lanmark 2000
E. Jacks and Jack Assemblies for UTP Cable: Modular, color-coded, RJ-45 receptacle units with integral IDC-type terminals.
   1. Modular Faceplate:
      a. Size: Single Gang
      b. Outlet Positions: 4 or 6 port. See detail drawings
      c. Fillers: As required for unused jack openings
      d. Color: Match color of electrical devices
2. Surface Mount Boxes:
a. Wiremold deep surface mount boxes

3. Voice Jack (Wall Phone):
a. Mounting: Wall plate with studs to support phone
b. Plate: Stainless steel
c. Pins: 8
d. Connection: T568B
e. Manufacturer: Semtron Plate with Ortronics Clarity 6 Tracjack P/N OR-TJ600-13

4. Data Jack:
a. Mounting: In modular faceplate
b. TIA/EIA Category: 6
c. Pins: 8
d. Connection: T568B
e. Color: Blue
f. Manufacturer: Ortronics Clarity 6 Trackjack P/N OR-TJ-600-36

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, Stands per Cable: 4 singlemode, unless otherwise indicated.
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.

PART 3 - EXECUTION

3.1 APPLICATION OF MEDIA
A. Copper Horizontal Cable: Use UTP Category 6 cable for runs between telecommunications rooms and workstation outlets. Terminate on patch panels in the telecommunications room.
B. Fiber Optic Horizontal Cable: Use singlemode fiber optic cable for runs between telecommunications rooms and designated workstation outlets. Leave both ends unterminated and neatly coiled and stored for future use.

3.2 INSTALLATION
A. Provide quantity of horizontal cables as indicated on the floor drawings and detail drawings. Install cables continuous from the jack on the telecommunication outlet faceplate to the termination frame serving the area. Do not splice horizontal cables.
B. Terminate cables in accordance with EIA/TIA-568-B Commercial Building Telecommunications Wiring Standard, observing the industry standards for terminating the various types of color coded cables within a building.

C. Adequately support cables from building structure in such a manner that the cable will not be damaged by normal building use. Provide strain relief for the cables above suspended ceilings, and where any continuous cable support system is interrupted, using mechanical fasteners such as J-hooks and other necessary devices to support cables from the structure or ceiling support. Do not use suspended ceiling support wires or ceiling grid to support telecommunications cabling.

D. Route cables in a direct path between the termination points. Neatly arrange cables in cable trays and in communication closets. Provide “D” rings spaced a maximum of 12” on center to support cables run on the face of any plywood wall.

E. Plan cable installation and cable routes such that the capacity of the conduit and cable tray is used most efficiently. Fill conduits and sleeves to maximize capacity and to minimize cross-over of future cable installations.

3.3 JACKS

A. Provide jacks as indicated on the drawings.

B. Provide a filler for each unused faceplate opening.

C. Install jacks in outlet boxes indicated on drawings. Provide faceplates as required.

3.4 HORIZONTAL CABLES

A. Provide horizontal cables from each outlet to the designated telecommunications room as indicated on the drawings.

B. Route cables from outlets to communication closets so that the maximum cable length is 295 feet or 90M. Install cables parallel to the building structure.

C. Allow adequate slack for cable termination.

1. Wall outlets: 12 inches
2. Systems furniture: as necessary to reach the farthest point on each desktop using the furniture raceways plus 12 inches at the jack location.
3. Communication Rooms: as necessary to reach the most distant patch panel or punch-down block plus a length equal to 2 times the room height.

D. Neatly arrange cables in cable trays and in telecommunications rooms.

E. For areas and locations that are close to EIA/TIA distance limits, run a length test on proposed routing to said area or location. Inform Owner and Engineer of any jacks beyond EIA/TIA distance limits. Owner and Engineer shall not be responsible for out-of-distance outlets that are not tested prior to installation.
3.5 HORIZONTAL CABLE PATHWAYS

A. In renovation projects, telecommunications cable pathways cannot always be accurately predicted and may need to be adjusted during construction. Direct pathways are needed to maintain cable length as required by this specification. The Engineer and Contractor shall work together in a creative and diligent manner to find short pathways for telecommunications cables.

B. If, in the course of installation, the Contractor finds a location that appears to exceed the distance limitation, it shall be the responsibility of the Contractor to field verify the actual distance prior to installing the horizontal cable. Upon discovery of an over-length cable, the Contractor shall cease installation of the cable and immediately notify the Owner and Engineer. The Contractor shall follow this notification with a formal Request for Information (RFI). The Contractor shall consult with the Engineer and Owner to resolve the problem. There shall be no additional payment to the Contractor for rerouting of over-length cables which are discovered after installation.

3.6 OPTICAL FIBER BACKBONE CABLE INSTALLATION

A. Provide continuous optical fiber cable from the telecommunications room to the work area being served to the work area. Do not splice cables.

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

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 the telecommunications room end and 3 feet at the work area end. Place the location of the service loop at the telecommunications room 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. Coil the slack at the work area in the backbox for future use.

END OF SECTION 17020