

SECTION 25160 HORIZONTAL CABLING

PART 1 - GENERAL

1.1 SUMMARY

- SCOPE OF WORK

1. Horizontal cabling is the portion of the cabling system that extends from the work area to the Telecommunications Room or communications center in the case where the communication center serves as a communication closet for an area. The horizontal cabling shall be configured in a star topology. The horizontal cabling includes the horizontal cables, the mechanically terminated jacks/inserts and the faceplates that the jacks/inserts snap into, in the work area.
2. This section includes minimum requirements for the following:
 - a) <<CATEGORY 6>> UTP Cable from TR to Workstation
 - b) <<CATEGORY 6>> Jacks
 - c) <<CATEGORY 6>> Patch Cables
 - d) Faceplates
 - e) Installation and Termination Methods
3. . Related Sections include the following:
 - a) 17150 Backbone Cabling Requirements
 - b) 17160 Horizontal Cabling Requirements

1.2 QUALITY ASSURANCE

- A. All cable shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the Network & Telecommunications Management. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed. Where "approved equal" is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to approval.
- B. Strictly adhere to all <<CATEGORY 6>> installation practices when installing UTP data cabling.
- C. Materials and work specified herein shall comply with the applicable requirements of:
 1. ANSI/TIA/EIA - 568-B Commercial Building Telecommunications Cabling Standard
 2. ANSI/TIA/EIA - 569-A Commercial Building Standard for Telecommunications Pathway and Spaces

3. EIA/TIA-606-A Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
4. EIA/TIA-607 Commercial Building Grounding and Bonding requirements for Telecommunications
5. NEMA - 250
6. Federal Communications Commission 47 CFR 68.
7. BICSI Telecommunications Distribution Design Manual (9th edition)
8. BICSI Customer Owned Outside Plant Design Manual (2nd edition)
9. BICSI Telecommunications Cabling Installation Manual (2nd edition)
10. ANSI/NECA/BICSI 568-2001 Standard for Installing Commercial Building Telecommunications Cabling
11. ADA - Americans with Disabilities Act
12. NFPA 70 - 2002, including:
 - a) NEC - Article 770
 - b) NEC - Article 800
13. Underwriters Laboratory

1.3 SUBMITTALS

- A. Manufacturers catalog sheets, specifications and installation instructions for all cable, <<CATEGORY 6>> inserts, faceplates and jacks.
- B. If providing pre-standards manufacturer system solution, submit installer/contractor certification documentation and channel certification information and requirements from manufacturer.

PART 2 - PRODUCTS

2.1 100 OHM UNSHIELDED TWISTED PAIR CABLE (UTP)

- A. Physical Characteristics:
 1. Shall be plenum/pvc rated and meet applicable requirements of ANSI/ICEA S-80-576. All 4 pairs must be F.E.P. No 2x2 or 3x1 F.E.P. cables will be allowed.
 2. The diameter of the insulated conductor shall be .048 in. maximum.
 3. Shall consist of (4) 24 AWG Twisted pairs.
 4. The color coding of pairs shall be:

| | |
|--------|----------|
| Pair 1 | W-BL; BL |
| Pair 2 | W-O; 0 |
| Pair 3 | W-G; G |
| Pair 4 | W-BR; BR |

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5. The overall diameter of the cable shall be less than 0.25 inches.
6. The ultimate breaking strength measured in accordance with ASTM D 4565 shall be 400 N minimum.
7. Cable shall withstand a bend radius of 1 inch at -20 degrees Celsius without jacket or insulation cracking.
8. Labeled third party "Verified Category 6".
9. Blue cable shall be provided for all cables terminated to patch panels in the TR's that are designated for data services.

B. Transmission Characteristics:

- Shall meet TIA 568-B.2-1 standard for Category 6 UTP cable.

C. Acceptable Manufacturers:

- AVAYA

2.2 <<CATEGORY 6>> JACKS

A. Physical Characteristics:

1. Shall be functional from -10 degrees F to 140 degrees F.
2. Shall be tested in accordance with ANSI/EIA/TIA-568-B.2-1 for Category 6
3. Shall be modular RJ45 jacks that snap into user configurable faceplates meeting durability requirements specified in IEC 603-7. Provide impact resistant faceplates nylon with label indicating Room number and patch panel port [A-Z].

B. Shall be 110 IDC, RJ45 type suitable for eight 22-26 AWG wires and be certified <<CATEGORY 6>> compliant.

C. Conductors shall be separated and aligned internally by jack comb.

D. Wired in accordance with EIA/TIA <<T568B>> polarization sequence.

- Design Make: AVAYA ; mfg # MPS100E- 003

2.3 FACEPLATES

A. Faceplates installed in office area shall be high impact thermoplastic flush mounted design.

B. Single gang faceplates shall be 2.75" x 4.5".

C. Double gang faceplates shall be 4.5" x 4.5".

D. Faceplates shall be UL listed.

E. Design Make:

- Acceptable Styles:

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- a) Plastic
 - AVAYA –
Single gang: mfg# M10A-003
Double gang: mfg# M12L-003
- b) Stainless Steel
 - AVAYA –
Single gang : mfg # 630B4H ; 105 983 142
Double gang: mfg # M12SP; 108 615 188
- c) Modular Furniture Faceplate Assemblies
 - AVAYA – M13C-246
- d) Surface Mount Boxes
 - AVAYA –
Single gang: mfg # M101SMB
Double gang: mfg # M102SMB

2.4 WALL PHONE WALL JACK ASSEMBLY

- A. Shall be constructed of plastic
- B. Shall have mounting lugs designed to mate with corresponding telephone base plate or adapter.
- C. Shall mount to single gang outlet box.
- D. Shall be wired to TIA-568B.
- E. Design Make: SPC Technology. Mfg # TA-5-6

2.5 100 OHM UTP PATCH CABLES

- A. Physical Characteristics.
 - 1. Shall have stranded conductors and meet <<CATEGORY 6>> performance criteria as defined by TIA 568-B.2-1 for Category 6
 - 2. Lengths required will range from 4' to 15' as required by customer. See Bid Forms.
 - 3. Shall be blue in color.
 - 4. Insulated conductor diameters shall not exceed (0.047 in.).
- B. Design Make: Avaya

PART 3 - EXECUTION

INSTALLATION

- A. UTP Cable:
 - 1. All wiring concealed in walls or soffits shall be installed in metal conduits.
 - 2. All exposed wiring shall be installed in surface raceway.

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3. All wiring above ceilings shall be installed in cable tray or open top cable hangers.
 4. Cable above accessible ceilings shall be supported 3' on center from cable support attached to building structure.
 5. Do not untwist cable pairs more than 0.5 in. when terminating.
 6. The Contractor shall be responsible for replacing all cables that do not pass <<CATEGORY 6>> requirements.
 7. Maximum length shall be 60 meters.
 8. Cable shall have no physical defects such as cuts, tears or bulges in the outer jacket. Cables with defects shall be replaced.
 9. Install cable in neat and workmanlike manner. Neatly bundle and tie all cable in closets. Leave sufficient cable for 90° sweeps at all vertical drops.
 10. Maintain the following clearances from EMI sources.
 - a) Power cable - 6 in.
 - b) Fluorescent Lights - 12 in.
 - c) Transformers - 36 in.
 11. Do not install <<CATEGORY 6>> cable with more than 110N (25 lbs) pull force, as specified in EIA/TIA and BICSI practices. Utilize appropriate cable lubricant in sufficient quantity to reduce pulling friction to acceptable levels on: long pulls inside conduit, pulls of multiple cables into a single small bore conduit, on conduit runs greater than 100 lineal feet with bends of opposing directions, and in conduit runs that exceed 180 degrees of accumulated bends. Use of tensile rated cords (i.e. fishing line) should be used for difficult or questionable pulls - to judge to go/no-go condition of the conduit and pulling setup.
 12. Cables jackets that are chaffed or burned exposing internal conductor insulation or have any bare copper ("shiners") shall be replaced.
 13. Firestop all opening where cable is installed through a fire barrier.
- B. Inserts and Faceplates
1. All cables shall be terminated with high density modular jacks that snap into a faceplate mounted on a wall outlet box, surface raceways or power pole.
 2. Outlet boxes shall be secured to building with mechanical fasteners. Adhesive fasteners are not allowed.
 3. All extra openings to be filled with blank inserts.
 4. Terminate cable per EIA/TIA <<T568B>> standard pin assignments.
 5. Locate so that combined length of cables and cords from panel to phone or computer does not exceed 3m.

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END OF SECTION