

**SECTION 27 16 19****TELECOMMUNICATIONS PATCH CORDS, STATION CORDS, AND CROSS CONNECT WIRES****PART 1 - GENERAL**

## 1.1 SUMMARY

- A. This section specifies telecommunications patch cords (for use in telecommunications rooms), station cords (for use at work area outlets), and cross connect wire (for use in telecommunications rooms).
1. The contractor shall supply cross connect wire as part of a complete and functioning telecommunications system.
  2. The contractor shall supply station cords (deliverable to UT ITS) for 100% of the installed work area outlet modular jacks that match the cabling performance (e.g., category 5e, category 6A, OM4, OS2).
  3. The contractor shall supply patch cords (deliverable to UT ITS) for 100% of the installed modular jack ports in all contract-installed patch panels or modules (e.g., balanced twisted-pair and optical fiber) that match the cabling performance (e.g., category 5e, category 6A, OM4, OS2).

## 1.2 RELATED DOCUMENTS

- A. The latest editions of the following codes, standards, and guidelines shall be followed. Bring to ITS' immediate attention where construction documents or conditions differ from the requirements in codes, standards, guidelines or specifications.
- B. The following codes, as required by law.
1. ANSI/NFPA-70, National Electrical Code<sup>®</sup> (NEC<sup>®</sup>)
- C. The following standards.
1. ANSI/TIA-568-C.0, Generic Telecommunications Cabling for Customer Premises
  2. ANSI/TIA-568-C.2, Balanced Twisted-Pair Telecommunications Cabling and Components Standards
  3. ANSI/TIA-568-C.3, Optical Fiber Cabling Components Standard
  4. ANSI/TIA-606-B, Administration Standard for the Telecommunications Infrastructure
- D. The following guidelines.
1. BICSI, Telecommunications Distribution Methods Manual (TDMM)
  2. BICSI, Information Transport Systems Installation Methods Manual (ITSIMM)
- E. The following project specifications.
1. 27 05 53 Identification for Communications Systems
  2. 27 11 13 Communications Optical Fiber Backbone Cabling
  3. 27 11 19 Termination Blocks and Patch Panels
  4. 27 15 13 Communications Copper Horizontal Cable
  5. 27 15 43 Communications Faceplates and Modular Jacks

### 1.3 SUBMITTALS

- A. The following submittals shall be provided at the Pre-Construction Phase, in accordance with submittal requirements in Section 27 00 00 Communications. UT ITS shall have final approval of products.
1. Product Information.
    - a) Provide manufacturer's product information cutsheet or specifications sheet with the specific product number identified or filled out.
    - b) Provide manufacturer's product information showing system performance is maintained when using a variety of modular jacks (e.g., wall, patch panel), cable and patch cords (be manufacturer and product specific).
    - c) Provide spreadsheet (in Microsoft Excel format), indicated cord cable type (e.g., category, stranded), manufacturer, part number, and quantity of cords to be supplied to UT ITS.
    - d) All submittals that are incomplete shall be returned without review.

## PART 2 – PRODUCTS

### 2.1 GENERAL

- A. Manufacturer shall be such that the advanced telecommunications system warranty shall be met.
- B. Product shall adhere to matching the environment to which they are installed (e.g., plenum-rated cords for plenum spaces).

### 2.2 COPPER CROSS CONNECT WIRE

- A. Provide one (1) 1000 ft spool of 24 AWG one-pair (twisted-pair) cross-connect wire for each equipment room and telecommunications room.

### 2.3 COPPER PATCH CORDS (FOR USE IN TELECOMMUNICATIONS ROOM [IDFS] AND EQUIPMENT ROOM [MDF])

- A. Patch cords shall be four-pair, unshielded, balanced twisted-pair enveloped within a single jacket with factory-terminated RJ-45 plug-modules on each end.
- B. Patch cords shall be equipped with snagless fixtures.
- C. Cords shall meet the highest performance component of the cabling link (see ANSI/TIA-568-C.2).
- D. The cord cable pairs shall meet the color code specified in ANSI/TIA-568-C.2 and ANSI/TIA-568-C.0.
- E. The cord cable pairs shall be terminated to match the T568B wiring description in ANSI/TIA-568-C.0.
- F. Length
1. 30% of the patch cords for 100% of the installed patch panel ports shall be five (5) feet in length.
  2. 60% of the patch cords for 100% of the installed patch panel ports shall be seven (7) feet in length.

3. 10% of the patch cords for 100% of the installed patch panel ports shall be ten (10) feet in length.

G. Color

1. Patch cord sheath color shall be requested from UT ITS three (3) months prior to Substantial Completion.

H. Manufacturer shall be the same as copper connectivity manufacturer.

1. Ortronics
2. Panduit
3. or equivalent

2.4 COPPER STATION CORDS (FOR USE AT WORK AREA OUTLETS)

- A. Cords shall be four-pair, unshielded, balanced twisted-pair enveloped within a single jacket with factory-terminated RJ-45 plug-modules on each end.

- B. Cords shall meet the highest performance component of the cabling link (see ANSI/TIA-568-C.2).

- C. The cord cable pairs shall meet the color code specified in ANSI/TIA-568-C.2 and ANSI/TIA-568-C.0.

- D. The cord cable pairs shall be terminated to match the T568B wiring description in ANSI/TIA-568-C.0..

E. Length

1. 60% of the station cords for 100% of the installed modular jacks at the work area outlet shall be ten (10) feet in length.
2. 25% of the station cords for 100% of the installed modular jacks at the work area outlet shall be fifteen (15) feet in length.
3. 15% of the station cords for 100% of the installed modular jacks at the work area outlet shall be ten (20) feet in length.

F. Color

1. Station cord sheath color shall be requested from UT ITS three (3) months prior to Substantial Completion.

G. Manufacturer shall be the same as copper connectivity manufacturer:

1. Ortronics
2. Panduit
3. or equivalent

2.5 FIBER OPTIC PATCH CORDS

A. Single-mode

1. Optical fiber patch cords shall be duplex.
2. Optical fiber shall be single-mode; OS2 performance (see ANSI/TIA-568-C.3).
3. Optical fiber glass type shall be bend insensitive.
4. Connector shall be LC/APC on one end and LC/UPC on the other end.
5. Minimum bend radius shall be 10mm.

6. Insertion Loss maximum shall be 0.2dB.
  7. Return Loss maximum shall be -58dB.
  8. Humidity range shall be 5 to 95% relative humidity.
  9. End-face shall be Harden Lens Contact (HLC).
  10. Length
    - a) 30% of the patch cords for 100% of the installed patch panel ports shall be five (2) meters in length.
    - b) 50% of the patch cords for 100% of the installed patch panel ports shall be seven (3) meters in length.
    - c) 10% of the patch cords for 100% of the installed patch panel ports shall be ten (5) meters in length.
    - d) 10% of the patch cords for 100% of the installed patch panel ports shall be ten (6) meters in length.
  11. Color
    - a) The duplex cord sheath shall be yellow.
    - b) The LC/UPC connector strain relief and connector plug body shall be blue.
    - c) The LC/APC connector strain relief and connector plug body shall be green.
  12. Manufacturer shall be:
    - a) Megladon
    - b) Systimax
    - c) Corning
    - d) Panduit
    - e) or equivalent
- B. Multimode
1. Optical fiber patch cords shall be duplex.
  2. Optical fiber shall be multimode; OM4 performance (see ANSI/TIA-568-C.3).
  3. Optical fiber glass type shall be bend insensitive.
  4. Connector shall be LC/UPC on one end and LC/UPC on the other end.
  5. Minimum bend radius shall be 15mm.
  6. Insertion Loss maximum shall be 0.2dB.
  7. Return Loss maximum shall be -45dB.
  8. Humidity range shall be 5 to 95% relative humidity.
  9. End-face shall be Harden Lens Contact (HLC).
  10. Length
    - a) 30% of the patch cords for 100% of the installed patch panel ports shall be five (2) meters in length.

- b) 50% of the patch cords for 100% of the installed patch panel ports shall be seven (3) meters in length.
  - c) 10% of the patch cords for 100% of the installed patch panel ports shall be ten (5) meters in length.
  - d) 10% of the patch cords for 100% of the installed patch panel ports shall be ten (6) meters in length.
11. Color
- a) The duplex cord sheath shall be aqua.
  - b) The LC/UPC connector strain relief and connector plug body shall be aqua.
12. Manufacturer shall be:
- a) Megladon
  - b) Systemax
  - c) Corning
  - d) Panduit
  - e) or equivalent

### **PART 3 - EXECUTION**

#### **2.1 GENERAL**

- A. Patch cords and wire shall be delivered one (1) month prior to Substantial Completion.
- B. UT ITS shall be notified of patch cord and wire delivery.

#### **2.2 COPPER CROSS CONNECTS**

- A. Provide one (1) 1000 foot reel of white/blue cross connect wire in each telecommunications room (IDF) and equipment room (MDF).
- B. Provide one (1) 1000 foot reel of white/red cross connect wire in each telecommunications room (IDF) and equipment room (MDF).

#### **2.3 COPPER PATCH CORDS (FOR USE IN TELECOMMUNICATIONS ROOM [IDFS] AND EQUIPMENT ROOM [MDF])**

- A. Patch cords shall be distributed among telecommunications rooms according to the number of patch panel ports in the telecommunications room or equipment room.
- B. Each box of patch cords shall be marked to identify the use as being for patch panel use.

#### **2.4 COPPER STATION CORDS (FOR USE AT WORK AREA OUTLETS)**

- A. Patch cords shall be distributed among telecommunications rooms according to the number of work area outlet ports fed by the telecommunications room or equipment room.
- B. Each box of patch cords shall be marked to identify the use as being for work area outlet use.

#### **2.5 FIBER OPTIC PATCH CORDS**

- A. Single-mode

1. Patch cords shall be distributed among telecommunications rooms according to the number of patch panel ports in the telecommunications room or equipment room.
  2. Each box of patch cords shall be marked to identify the use as being for patch panel use.
- B. Multimode
1. Patch cords shall be distributed among telecommunications rooms according to the number of patch panel ports in the telecommunications room or equipment room.
  2. Each box of patch cords shall be marked to identify the use as being for patch panel use.

**END OF SECTION**