

Cable Installation Project

1. **Intent.** It is the intent of the U.S. Court of Appeals to install Category 6 (CAT6) data cabling in the Robert F. Peckham Federal Building and United States Courthouse, 280 S 1st St, Room 505, San Jose, CA 95113-3001 for the use in a 100/1000 BaseT Local Area Network (LAN). It shall be the obligation of the installer to accomplish all tasks to facilitate this intent, whether specified in this document or not.
2. **Specifications.** Specifications for components are included in Appendix A.
3. **Statement of work.** Statement of work is included as Appendix B.
4. **Finish Schedule.** Prior to beginning work, installer shall submit a finish schedule and samples of items. The face plates will be white for painted walls, brown for millwork walls. Contractor to submit a sample of each for approval. Samples will be returned to installer upon approval. NOTE: Cosmetic considerations are important in a judicial chambers environment. All work shall be accomplished in a workmanlike manner, and every effort must be made to minimize impact on existing finishes, and to minimize visibility of installed cables, support material and jacking. Installer will be responsible for repairing any defects to existing finishes and existing furnishings/equipment in chambers caused during the implementation of this project. Every effort must be made to maintain the dignity of judiciary property.
5. **Deliverables.** Within 5 days of receipt of purchase order, installer shall deliver, via fax, express service or in person, cut sheets for all proposed components or equipment for approval by government. Upon completion of work, installer shall deliver test results, as specified in *System Testing Requirements*, along with completed list of installed cable with identifying marking schedule, as installed.
6. **Warranty.**
 - a. The installer shall provide at a minimum, one (1) year warranty for the cabling system to include performance, reliability and failure of components.
 - b. Moves, adds and/or changes made by the Court shall not invalidate (e.g., void) the warranty.

Appendix A

Installation of Station Cables

All work shall be performed in conformance with national electrical standards, IEEE standards, and the cabling system shall comply with transmission standards in TIA/EIA-568-C.2, when tested according to test procedures of this standard for CAT6 cable.

1) Install four (4) 4-pair Category 6 (CAT6) LAN UTP station cables to all stations as indicated on the contract drawings. LAN UTP station cables shall be installed in a manner such that there are no kinks or crimps and shall not exceed the manufacturer's recommended bend radius. Where cable is suspended above the ceiling using Cable Support Bridle Rings with Saddle, spacing should be no more than two feet apart.

2) At all LAN UTP stations, terminate all four pairs of cable on an RJ-45 consistent with CAT6 jack for LAN service. Jacks shall be installed in a manner consistent with CAT6 termination practices. The jacket shall not be removed more than 0.75" and pair twist shall be maintained to within 0.5" of the connector.

3) All station cables (49 drops/wall plates with 4 cables) shall be continuous and splice-free from the 5th floor data closet (5171) patch panel port to the end-user office port. Where conduit is used the cable population standard for the Court is derived from ANSI/TIA/EIA 569-C and is:

- (8) Cables – 1" Conduit
- (14) Cables – 1- 1/4" Conduit
- (32) Cables – 2" Conduit

4) Maintain consistent absolute pairing and signal polarity at all connectors, patch points and connection-points within the system.

5) Dress or harness all wires and cables to prevent mechanical stress of electrical connectors:

- a) No wire or cable shall be supported by a connection point.
- b) Provide service loops where harnesses of different classes/floors cross, or where hinged panels are to be interconnected.
- c) Separate and dress station cables by floors, by areas, by room numbers, etc.

6) Provide unique identification labels on both ends of all cables:

- a) Dress and label cables in a logical manner by floors, by areas, by room numbers, etc.
- b) Labeling shall be designated based on office number and position. For example 100-A1, 100-A2.

- 7) Install the modular jacks in the jack dual mounting frame. Furnish and install a faceplate for all wall and modular furniture jacks.
 - a) Provide a label with a unique number for all office faceplates and all jacks.
 - b) Submit number labeling scheme based on room number. For example 100-A1, 100-A2.
- 8) At the existing data rack in cable termination closet 5171 , terminate the LAN UTP station cables on Ortronics/Clarity patch panel(s) 48 port 4/6 110 Quad, 3.5 x 19 x 1/8 2 to 5, 110 back 8 pin RJ45 front. Cables shall be terminated in a manner consistent with CAT6 termination practices. The jacket shall not be removed more than 0.75" and pair twist shall be maintained to within 0.5" of the connector cable terminations.
- 9) Provide a unique identification label for all patch panel ports:
 - a) Dress and label cables in a logical manner by floors, by areas, by room numbers, etc.
 - b) Submit number labeling scheme based on room number. For example 100-A1, 100-A2.
- 10) Appropriately and in a quality craftsmanship manner, dress-in all patch jumper cables into the horizontal and vertical wire management system.

System Testing Requirements - CAT6 Cable Tests

- 1) All LAN UTP station cables shall be tested with IEEE compliant and calibrated test equipment for CAT6 cabling. If equivalent instrument is used, the Contractor shall show evidence of test equipment equality to instrument specified:
 - a) Each cable shall be tested for shorts, opens, split pairs, dc resistance, length, impedance, attenuation, NEXT, PoE, and noise.
 - b) Measurements shall be conducted through calibrated jumper cables at the user outlet jack and the source.
 - c) Computer print-out or PDF of each cable measurement shall be provided.
 - d) Record of measurements shall be part of the contractor's final close-out deliverables, project record documents.

Installation of Backbone Cable

BACKBONE CABLING DESCRIPTION

Backbone cabling system shall provide interconnections between communications equipment rooms, main terminal space, and entrance facilities in the telecommunications cabling system structure. Cabling system consists of backbone cables, intermediate and main cross-connects, mechanical terminations, and patch cords or jumpers used for backbone-to-backbone cross-connection.

1. PERFORMANCE REQUIREMENTS

General Performance: Backbone cabling system shall comply with transmission standards in TIA/EIA-568-C.2, when tested according to test procedures of this standard.

2.1 OPTICAL FIBER CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Berk-Tek; a Nexans company.
2. Corning Cable Systems.
- 3 Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. Description: Multimode Interlocking Armor Plenum Fiber Optic Cable 50 Micron, 12 strand fiber, tight buffer, optical fiber cable.

1. Comply with ICEA S-83-596 for mechanical properties.
2. Comply with TIA/EIA-568-C.3 for performance specifications.
3. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and NFPA 70 for the following types:
 - a. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262.

C. Jacket:

1. Jacket Color: Orange.
2. Cable cordage jacket, fiber, unit, and group color shall be according to TIA/EIA-598-C.3.
3. Imprinted with fiber count, fiber type, and aggregate length at regular intervals.

2.2 OPTICAL FIBER CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Berk-Tek; a Nexans company.
2. Corning Cable Systems.
3. Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. Cross-Connects and Termination Panels: Modular panels housing multiple-numbered, duplex cable connectors. Terminate all cable pairs. For example: If a 12 strand cable is used, terminate all 3 pairs.

1. Number of Connectors per Field: One for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to suit specified expansion criteria.

C. Jumper Cords: Two factory-made, dual-fiber cables in lengths to be determined.

D. Cable Connecting Hardware:

1. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12.

Comply with TIA/EIA-568-C.3.

2. Quick-connect, simplex and duplex, Type LC connectors. Insertion loss not more than 0.75dB.

2.3 WIRING METHODS

A. Wiring Method: Install cables in raceways and cable trays except within cabinets. Conceal raceway and cables except in unfinished spaces.

1. Install plenum cable in all spaces.
2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

B. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

2.4 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Comply with TIA/EIA-568-C.1.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. For UTP cable, install 110-style IDC termination hardware unless otherwise indicated.
4. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals. Include wire management at racks.
6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Use lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
10. In the communications equipment room, install a 10 foot long service loop on each end of cable.

11. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

1. Comply with TIA/EIA-568-C.2.

D. Optical Fiber Cable Installation:

1. Comply with TIA/EIA-568-C.3.
2. Cable shall be terminated on connecting hardware that is rack or cabinet mounted.

Appendix B

Statement of Work

1. Provide and install Cable Support Bridle Rings with Saddle to support cable above ceiling. Spacing should be no further than two feet apart. Drilling must be done after normal business hours.
2. Provide and install fire stop in areas where penetration through fire walls are needed, in accordance with accepted local practice and local/national building codes.
3. Provide and install the following:
 - a. Install new Ortronics/Clarity patch panels, as described in item 8. of Installation of Station Cables, in the existing rack in data closet 5171, to include cable management, where all cables from the new space will terminate.
 - b. Install Multimode 50 Micron Interlocking Armor Plenum Fiber Optic Cable from the rack, as described in item A. OPTICAL FIBER CABLE HARDWARE, in data closet 5171 to 2nd floor data Server Room #2165 of the District Court to the existing Corning wall mount. Connectors shall be LC. Use a 6 pair fiber cable and terminate 3 of the pairs. Install metal sleeves at wall penetrations as needed.
 - c. Provide and install CAT6, 4 pair, plenum rated, twisted pair cables to each of the 49 locations identified as a voice/data location on the site drawings designated E 3
1. The first receptacle shall be blue in color and occupy the 1st position (top left) on the faceplate, and the three, or more, CAT6 data receptacles will be in matching color of the faceplates. Please note the two ceiling locations, above the drop ceiling, that will facilitate the installation of 2 Wi-Fi access points by Court Personnel. These two locations will have two (2) CAT6 , 4 pair, receptacles. Also install two (2) CAT3 telephone wiring in 2 Office locations, to be identified at a later date, and connect to the buildings PBX terminations. Use Leviton or Ortronics for jacks and wallplates.
 - d. Provide CAT6 station and fiber patch cables:
 - Forty (40) – 3' Green
 - Thirty (30) – 6' Beige Snagless
 - Ten (10) – 5' Green
 - Six (6) – 15' Beige
 - Six (6) – 20' Beige
 - Four (4) – 30' Beige Snagless
 - Two (2) – Multimode Fiber LC cables. Lengths to be determined.
 - e. Audio-Video Cabling:

a **Box A** below refers to the floorbox below the conference room table, and **Box B** refers to the box or plate behind the cabinet beneath the TV. (this cabinet is drawn in figure 32 on **A 5 01** in the "100%" drawings)

At Box A:

1 HDMI cable "whip" terminated in a male factory terminated HDMI plug running 6' from the floorbox, point to point to Box B.

1 Cat6 UTP cable terminating at Box B, point-to-point (female jacks either side)

4 Cat6 UTP cables terminating at the LAN wiring closet 5171.

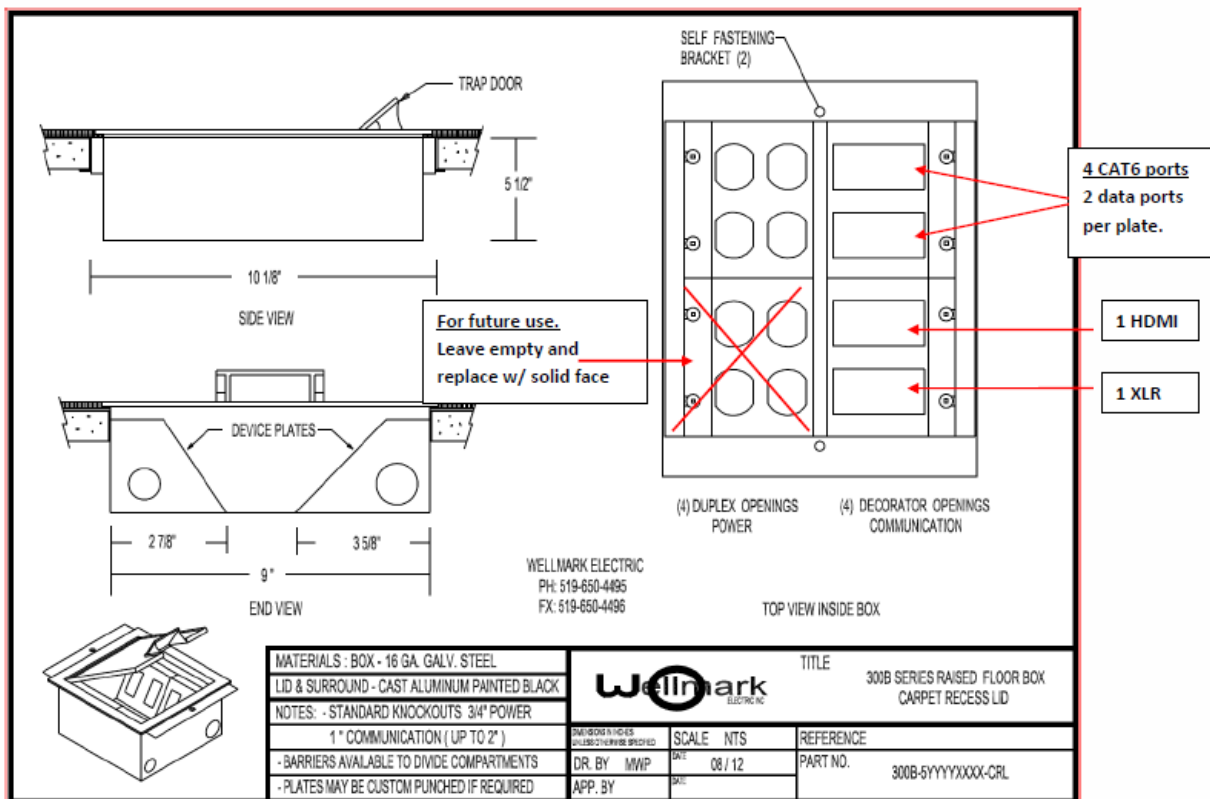
1 Three conductor balanced audio cable terminating at Box B. Female XLR panel mount jack

1 Four conductor balanced audio cable terminating at Box B. This is a special TRRS (Tip Ring Sleeve) jack for a Cisco VTC unit's microphone. Here are example links for the SOW:

Cable: <http://www.markertek.com/product/l-4e6s-bk/canare-l-4e6s-star-quad-microphone-cable-by-the-foot-black>

Female TRRS 3.5mm Panel mount jack: <http://www.showmecables.com/product/35mm-trrs-jack-panel-mount-connector-metal.aspx?link=YMAL>

4 AC 110 Power (provided by others)



At Box B:

1 HDMI factory terminated cable "whip" terminated in a male HDMI plug running 6' from the box, point to point to Box A.

Depending on the position of this wall or floorbox vis a vis the TV access panel, This cable "whip" may need to be longer or shorter than 6'

1 Cat6 UTP point-to-point cable terminating at Box A (female jacks either side)

7 Cat6 UTP cables terminating at the LAN wiring closet (for wired LAN)

1 Three conductor balanced audio cable terminating at Box A. Male XLR panel mount jack

1 Four conductor balanced audio cable terminating at Box B. 3.5mm female panel mount jacks.

This is a special TRRS (Tip Ring Ring Sleeve) jack for a Cisco VTC unit's microphone. Here are example links for the SOW:

Cable: <http://www.markertek.com/product/l-4e6s-bk/canare-l-4e6s-star-quad-microphone-cable-by-the-foot-black>

Female TRRS Panel mount jack: <http://www.showmecables.com/product/35mm-trrs-jack-panel-mount-connector-metal.aspx?link=YMAL>

4 AC 110 Power (provided by others)