

SECTION 27 15 00 COMMUNICATIONS HORIZONTAL CABLING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes horizontal copper cabling, outlets, terminations, patch cords where specified, and associated materials for communications systems.

1.2 SUBMITTALS

- A. Product data for horizontal cable, jacks, faceplates, and patch cords where specified.
- B. Installer qualifications and warranty eligibility documentation as required by Section 27 05 00.

PART 2 – PRODUCTS

2.1 COPPER CABLE (CMP EVERYWHERE + COLOR CODING)

- A. Provide CMP-rated Category 6A copper cable in all locations (CMP everywhere) as part of the selected structured cabling system and eligible for the manufacturer's registered system warranty. KU Campus Standard: Superior Essex 10Gain XP+ Cat6A CMP, part number 6B-272-xB (x = jacket color), 1000-foot spools.
- B. Jacket colors (campus standard): Green = Data; Blue = AV; White = Voice (optional; green-jacketed Cat 6A with white jack is the KU standard for limited analog voice runs — see §2.1.E).
- C. Outlet home runs: Provide one (1) 4-pair UTP Category 6A cable per jack. Where multiple jacks are indicated at a single location, each jack shall have its own dedicated 4-pair UTP cable.
- D. UL Performance Level: Category 6A 4-pair UTP cable shall be UL Performance Level tested. Each 1000-foot spool shall be individually tested with test results affixed to the package or included with the shipment.
- E. Voice (limited use cases): Category 5e cable is not specified for new work. Provide Category 6A CMP cable with GREEN jacket (KU data standard) for voice outlets. Voice jacks shall be WHITE and voice outlets shall remain identified, labeled, and administered as voice. Typical use cases include elevator analog lines and emergency telephones where required. Analog voice connection/patching method shall be coordinated with KU IT.

Note: Green cable / white jack is intentional; labeling must clearly identify voice circuits.

- F. Campus-standard cable and warranty eligibility: Provide the KU campus-standard Category 6A CMP cable specified in this Section as part of the complete registered structured cabling

system warranty. Cable shall meet all requirements of this Section including CMP rating, Category 6A performance (500 MHz), KU color coding, UL performance level testing where applicable, and the required headroom documentation. Include cable part numbers and written manufacturer warranty eligibility confirmation in the project submittals.

2.2 JACKS (CATEGORY 6A – SYSTEM FAMILY REQUIREMENT)

- A. Provide Category 6A modular jacks from the same manufacturer/system family as the selected structured cabling system and eligible for the manufacturer's registered system warranty.
- B. Data Jack (green): KU Campus Standard: Legrand/Ortronics Category 6A HDJ modular jack, P/N OR-HDJ6A-45 (Green); project-specific deviation Category 6A jack within the selected system family, matching color and form factor.
- C. AV Jack (blue): KU Campus Standard: Legrand/Ortronics Category 6A HDJ modular jack, P/N OR-HDJ6A-36 (Blue); project-specific deviation Category 6A jack within the selected system family, matching color and form factor.
- D. Voice Jack (white): KU Campus Standard: Legrand/Ortronics Category 6A HDJ modular jack, P/N OR-HDJ6A-88 (White); project-specific deviation Category 6A jack within the selected system family, matching color and form factor.

2.3 FACEPLATES AND INSERTS

- A. General: Faceplates shall be single gang unless more than four (4) ports are required at a location. Faceplates shall contain enough openings for all cables. Color shall align with other electrical outlets/switches for consistency, or as directed by the Professional for architectural finish coordination. Functional/ICT outlet requirements (port count, labeling, color-coding intent) shall be as designated by KU IT before bid and shown on the Drawings. Faceplates/inserts shall be compatible with the selected jack system and the selected structured cabling system family.
- B. Standard faceplates (HDJ series): Basis of Design (single gang, 4-port, HDJ series, plastic, cloud white): P/N OR-403HDJ14-88. Where more than four (4) ports are required, Basis of Design (double gang, 12-port, HDJ series, plastic, cloud white): P/N OR-403HDJ212-88.
- C. Where required, stainless steel faceplates (HDJ series): Basis of Design (single gang, 4-port, HDJ series, stainless steel): P/N OR-403SHDJ14. Where more than four (4) ports are required, Basis of Design (double gang, 12-port, HDJ series, stainless steel): P/N OR-403SHDJ212.
- D. Where TracJack-series jacks are selected as an 'project-specific deviation' in lieu of HDJ-series jacks — alternate faceplates (TracJack series, plastic): Basis of Design (single gang, 4-port, TracJack series, plastic, cloud white): P/N OR-40300546-88. Where more than four (4) ports are required, Basis of Design (double gang, 8-port, TracJack series, plastic, cloud

white): P/N OR-40300554-88. Note: TracJack-series faceplates are not applicable when HDJ-series jacks are installed.

- E. Where TracJack-series jacks are selected as an ‘project-specific deviation’ and stainless steel faceplates are required — alternate faceplates (TracJack series, stainless steel): Basis of Design (single gang, 4-port, TracJack series, stainless steel): P/N OR-403STJ14. Where more than four (4) ports are required, Basis of Design (double gang, 12-port, TracJack series, stainless steel): P/N OR-403STJ212. Note: TracJack-series faceplates are not applicable when HDJ-series jacks are installed.
- F. Provide blank inserts for unused openings in bezels. Provide duplex receptacle inserts for mounting outlets in surface raceway where required.
- G. Surface raceway and floor boxes: ensure jacks are compatible with raceway depth/faceplate; match faceplate color to raceway; keystone style jacks acceptable in floor boxes.

2.4 COMMUNICATIONS OUTLET CLASSIFICATIONS (FOR DRAWINGS)

- A. General: The following outlet “Class” designations define the minimum outlet configuration to be installed at each location when shown on the construction drawings.
- B. Unless otherwise indicated on the Drawings, each Category 6A jack shall be served by a dedicated Category 6A home-run cable to the serving MDF/IDF (telecommunications room).
- C. Surface Raceway: Where outlets are shown in surface raceway, install outlets in a faceplate and adapter/mounting method compatible with the surface raceway system. Single-gang is permitted for 1–4 ports where the surface raceway system supports it. Provide double-gang where required by the surface raceway system or where more than four (4) ports are required.
- D. Class 1: (1) Category 6A Data Outlet (green) with (1) Category 6A cable (green) to MDF/IDF.
- E. Class 2: (2) Category 6A Data Outlets (green) with (2) Category 6A cables (green) to MDF/IDF.
- F. Class 3: (4) Category 6A Data Outlets (green) with (4) Category 6A cables (green) to MDF/IDF.
- G. Class 3AV: (4) Category 6A Data Outlets (green) with (4) Category 6A cables (green) to MDF/IDF, and (1) Category 6A AV Outlet (blue) with (1) Category 6A AV cable (blue) routed within the room to the associated AV termination/device location as indicated on the drawings.
- H. Class 4: (6) Category 6A Data Outlets (green) with (6) Category 6A cables (green) to MDF/IDF.
- I. Class 4AV: (6) Category 6A Data Outlets (green) with (6) Category 6A cables (green) to MDF/IDF, and (2) Category 6A AV Outlets (blue) with (2) Category 6A AV cables (blue) routed within the room to the associated AV termination/device locations as indicated on the drawings.

- J. Class 5: (1) Category 6A Data Outlet (green) with (1) Category 6A cable (green) to MDF/IDF, and (1) F-type connector with (1) RG-6/U coaxial cable to the serving MDF/IDF (telecommunications room).
- K. Class 6: (2) Category 6A Data Outlets (green) with (2) Category 6A cables (green) to MDF/IDF, and (1) F-type connector with (1) RG-6/U coaxial cable to the serving MDF/IDF (telecommunications room).
- L. Class 7: (4) Category 6A Data Outlets (green) with (4) Category 6A cables (green) to MDF/IDF, and (1) F-type connector with (1) RG-6/U coaxial cable to the serving MDF/IDF (telecommunications room).

Note: Classes 5–7 include RG-6/U coaxial cable. See §2.6 for the coaxial cable specification. If coaxial is not applicable to this project, delete Classes 5–7 and §2.6 accordingly.

- M. Class 8: (1) Category 6A Voice Outlet (white) with (1) Category 6A CMP cable with GREEN jacket to MDF/IDF.

N. Outlet colors (campus standard): Green = Data; Blue = AV; White = Voice.

O. Cable color and destination (governing rule): GREEN-jacketed cabling home-runs to the serving MDF/IDF (telecommunications room); this includes data outlets and the green-jacket/white-jack voice outlets of §2.1.E. BLUE (AV) cabling is routed within the room to the AV device or in-room AV rack/AV-only switch and does not home-run to, or terminate on, an MDF/IDF patch panel. In-room AV beyond the terminated outlet jack is provided under the audio-video systems section (see §2.5.C).

2.5 PATCH CORDS (COPPER AND FIBER OPTIC – SYSTEM FAMILY)

- A. Copper Patch Cords (Category 6A): Provide patch cords from the same manufacturer/system family as the selected structured cabling system and eligible for the system warranty. KU Campus Standard: Ortronics Clarity Category 6A patch cords. Telecommunications Room (TR) / switch patch cords (patch panel to network switch) shall be GREEN for all copper patch panel ports regardless of the endpoint use (DATA, wireless AP, electronic access-control controller/panel network drop, Building Automation System (BAS) network-connected controller/panel or gateway drop, or other network-facing copper drop), unless otherwise directed by KU IT. Work-area patch cords shall match outlet function: DATA work-area cords shall be GREEN. Blue AV outlets are in-room only and do not terminate on an MDF/IDF patch panel; AV work-area cords are provided under the audio-video systems section (see Paragraph C). Provide factory manufactured patch cords in 5 ft, 7 ft, 9 ft, and 15 ft lengths unless otherwise approved by KU IT.
- B. Patch cord quantities and intent: 1. Telecommunications Room (TR) / switch patch cords: For each installed Category 6A copper data patch-panel port in the MDF/IDF, provide one (1) GREEN Category 6A patch cord for patching from the patch panel to Owner-furnished network electronics. TR / switch patch cord quantity shall be based on the total number of

installed Category 6A copper data patch-panel ports, not solely on the number of horizontal cables currently terminated on the rear of the patch panels. Category 6A voice patch-panel ports are addressed under Paragraph B.4 and do not receive a TR / switch patch cord under this Paragraph. Example: where four (4) 48-port Category 6A data patch panels are installed, provide one hundred ninety-two (192) GREEN TR / switch patch cords. Unless otherwise directed by KU IT, provide TR / switch patch cords in the following default length distribution: eighty-five percent (85%) 5-foot and fifteen percent (15%) 7-foot. Calculate quantities to whole cords and adjust the 7-foot quantity as required so the total equals the required number of TR / switch patch cords. 2. Work-area / station patch cords: For each installed DATA outlet shown on the Drawings, provide one (1) GREEN Category 6A work-area patch cord for connection from the telecommunications outlet to the user device. Work-area patch cords shall be delivered to KU IT as part of the project turnover unless KU IT directs installation at specific locations. Unless otherwise directed by KU IT, provide work-area / station patch cords in the following default length distribution: ten percent (10%) 7-foot, sixty percent (60%) 9-foot, and thirty percent (30%) 15-foot. Calculate quantities to whole cords and adjust the 9-foot quantity as required so the total equals the required number of work-area / station patch cords. 3. Wireless AP device patch cords: For each wireless AP outlet/cable, the TR / switch patch cord for its data patch-panel port is provided under Paragraph B.1; in addition, provide one (1) GREEN device patch cord from the AP jack/outlet to the AP. For ceiling-mounted APs, provide a GREEN device patch cord a minimum of 3 feet in length, or as directed by KU IT. For hospitality-style / in-room wall-jack AP connections, device patch cord length shall be 6 inches nominal and shall not exceed 12 inches (1 foot) unless otherwise approved by KU IT. AP device patch cords shall be provided in the AP-specific lengths required by this Section and Section 27 21 33 and are not governed by the standard work-area / station patch cord length distribution. 4. Voice / analog gateway interface cords: Where analog voice service is provided, provide the passive patch cords, adapter leads, and RJ-45-to-RJ-11 gateway interface components required to connect Category 6A voice patch-panel ports to the Owner-furnished analog voice gateway FXS ports, as specified in Section 27 11 19 §2.3.F. Quantities shall match the number of active analog voice lines / FXS ports shown on the Drawings or confirmed by KU IT. 5. Spare / attic-stock patch cords: Spare patch cords required under Section 27 08 00 §1.8 are in addition to the TR / switch patch cords, work-area / station patch cords, AP device patch cords, and analog gateway interface cords specified above. Total channel length (horizontal cable plus patch cords) shall comply with ANSI/TIA-568 requirements for Category 6A (100 meters maximum channel length).

C. Audio-video (AV / blue) outlets — scope and coordination: Blue AV outlets are in-room outlets that are not home-run to an MDF/IDF and do not terminate on an MDF/IDF patch panel. Under this Division, the Contractor furnishes and terminates the in-room blue Category 6A cable, jack, and faceplate at the AV outlet location, and the scope of this Division ends at the terminated outlet jack. AV work-area patch cords, the in-room AV rack and AV-only switch, AV-rack patching, and AV patch-cord attic stock are specified under the project audio-video

systems section (currently Section 27 51 15, "Audio Video Systems") and coordinated with the Owner's audio-video representative. The Professional shall confirm that the project audio-video systems section is included in the Contract Documents and accounts for AV work-area cords, AV-rack connectivity, and AV attic stock; if no audio-video systems section is present, or it does not address these items, the Professional shall resolve the gap before issuing for bid so that no AV scope is left unassigned between this Division and the audio-video systems section.

D. Fiber Optic Patch Cords / Jumpers: Where fiber optic backbone or equipment connections are provided under this Division, the Contractor shall furnish fiber optic patch cords (jumpers) as required to make each fiber link operational, from the fiber enclosure/housing adapter panel to Owner-furnished network electronics or to another enclosure adapter panel, in accordance with Section 27 13 00 (including the enclosure/patch-cord rule that no fiber shall connect to a device except by a jumper from the adapter panel). Fiber patch cords shall be factory-terminated, factory-tested assemblies from the same manufacturer/system family as the terminated fiber components and eligible for the system warranty; field-terminated fiber patch cords are not permitted.

1. Type and compatibility: Fiber optic patch cord fiber type shall match the fiber it connects — OS2 single-mode, OM4 laser-optimized multimode, or OM1 (62.5/125) multimode — and shall not mix incompatible fiber types across a link. Provide connector types, adapter types, and polarity (for example, LC duplex A-to-B, or MPO/MTP polarity for Data Center trunks) matching the terminated ports and the Owner-furnished electronics. Do not substitute OM3/OM4 aqua, ceramic-sleeve components for the OM1 fire-alarm path (see Section 27 13 00 §2.2.H).
2. Quantity: For each terminated fiber connection required to place a backbone or equipment link in service, provide one (1) fiber optic patch cord of the correct type, connector, and polarity — that is, one jumper at each end of the link where the link patches from an enclosure adapter panel to network electronics or to another enclosure. Fiber patch cord quantity shall be based on the number of terminated fiber links/ports the Drawings place in service, not on the number of installed strands. The OM1 fire-alarm field-housing-to-panel patch cord required under Section 27 13 00 §2.2.H.3 is provided under that Section; where its quantity is stated there it is not duplicated under this Paragraph.
3. Length: Provide fiber optic patch cords in lengths suited to the enclosure-to-equipment or enclosure-to-enclosure routing, with adequate slack for dressing and bend-radius compliance and without excess coil. Coordinate lengths with the final rack elevations and enclosure/equipment positions; do not exceed the applicable channel/link loss budget.
4. Spare / attic-stock: Provide spare fiber optic patch cords per Section 27 08 00 §1.8. Spare fiber patch cords are in addition to the project-use fiber patch cords specified above.

2.6 COAXIAL CABLE (RG-6 QUAD SHIELD, CMP) [DELETE IF NOT APPLICABLE]

PROJECT DECISION REQUIRED BEFORE BID. Conditional section — retain this coaxial section and outlet Classes 5–7 only where the project includes CATV/RF coaxial distribution and the coaxial outlet locations and counts are shown on the Drawings, per Issue Checklist C.7; otherwise delete this section in its entirety and remove Classes 5–7 from the outlet schedule.

- A. KU Campus Standard: Superior Essex, Part Number 78-14C-91.
- B. Description: RG-6 quad-shield, plenum rated (CMP), 75-ohm, solid 18 AWG copper-clad steel inner conductor, solid polyethylene dielectric, black jacket.
- C. Terminations/connectors shall be HEX crimped.
- D. Provide RG-6 cable from each outlet shown on the drawings back to the serving MDF/IDF (telecommunications room).
- E. Provide duplex receptacle inserts for mounting outlets in surface raceway. Provide Ortronics HDJF-00 (HDJ F-Connector) or OR-63700006-00 (TracJack F-Connector) as required.

PART 3 – EXECUTION

3.1 INSTALLATION (HORIZONTAL CABLING)

- A. Install Category 6A horizontal cabling in accordance with ANSI/TIA-568 series, ANSI/TIA-569, and manufacturer instructions.
 - A.1 Serving-room distance verification (before rough-in): Before rough-in, the Installer shall verify, from the Drawings and the planned cable routing, that each horizontal cable as assigned to its serving telecommunications room on the Drawings can be installed within the ANSI/TIA-568 permanent-link limit (90 meters / 295 feet) along the planned route, giving particular attention to the worst-case (most distant) run in each distinct outlet-serving area a room serves through a separate routed pathway. This is a constructability check of the layout shown, not a requirement to field-measure every cable. Where any outlet as drawn cannot be served within the limit from its assigned room, the Installer shall notify the Professional and KU IT in writing before installing that cable, so the condition can be resolved. This verification is a construction-stage check that the layout shown can be built within the distance limit; it does not transfer to the Contractor the Professional's design responsibility under Section 27 11 00 §1.1 for telecommunications-room location and count.
- B. Support cabling using approved pathways and supports. Use hook-and-loop (Velcro) fasteners only; nylon zip ties are not permitted.
- C. Maintain separation from electrical power systems to reduce interference. Cross power at 90 degrees where practicable.

D. Maintain bend radius and avoid over-bundling or compressing cables in pathways. Replace damaged cable.

E. Maintenance slack (horizontal): Where accessible ceiling space is available, provide a maintenance coil of a minimum of ten (10) feet of horizontal cable, coiled and supported above the accessible ceiling at or near the point where the cable drops to the work-area outlet, to facilitate future re-termination and minor outlet relocation. The maintenance coil is part of the installed horizontal/permanent link length and shall be included when verifying compliance with applicable Category 6A permanent-link and channel-length limits; do not exceed the maximum permanent-link or channel length permitted by ANSI/TIA-568 and the approved cabling system warranty requirements. Maintain bend radius within the coil. Terminate the work-area outlet with adequate slack within the outlet box; a concealed in-wall service loop is not required. Coordinate coil location and any length adjustment for ceiling constraints with KU IT.

3.2 TERMINATION, TESTING, AND IDENTIFICATION

A. Terminate all copper links using T568B per Section 27 05 00.

B. Test each copper link as a Category 6A permanent link and provide results per Section 27 08 00.

C. Label horizontal cabling, outlets, and associated patch panel ports in accordance with Section 27 05 53 and KU standards.