

SECTION 27 05 00 COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes: common requirements for Division 27 communications work including submittals, coordination, installer qualifications, installation quality, and closeout documentation.

A.1 Telecommunications room location and count (design criterion): The Drawings shall locate telecommunications rooms (MDF/IDF), and provide a sufficient number of them, so that every horizontal cable can serve its outlets within the permanent-link distance limit of ANSI/TIA-568 (90 meters / 295 feet maximum permanent link, reserving the balance of the 100-meter channel for patch cords), estimated along the planned cable route with reasonable allowance for the horizontal run, vertical rises, and pathway routing — not by straight-line distance, and not requiring a field-measured length. Locating telecommunications rooms to satisfy this criterion is a design responsibility, discharged through the party responsible for the Division 27 / telecommunications design and administered as provided in Section 27 05 00 §1.11.G (precedence and administration of design and coordination responsibilities). KU IT provides input on telecommunications-room layout (including rack, runway, and riser-sleeve arrangement) as provided elsewhere in this Division; confirming that room count and placement keep horizontal runs within the distance limit is part of that design responsibility (§1.11.G). The Drawings and the Division 27 Project Schedule (Section 27 05 00 §1.10.E) shall demonstrate before bid that the area served by each telecommunications room contains all of its assigned outlets within this limit. The demonstration is a worst-case check per served area, not a length for each individual cable or outlet, and shall take one of the following forms, so that it can be checked at plan review and verified during construction rather than inferred: (a) a stated calculated maximum routed permanent-link length for each distinct outlet-serving area a telecommunications room serves (the longest routed path from that room to any outlet in that area) — where a telecommunications room serves separated wings, floors, or renovation zones reached through different routed pathways, each such area is treated separately rather than as one building-wide maximum — shown on the Drawings or in the Division 27 Project Schedule and demonstrated to be within the 90-meter permanent-link limit; or (b) an attached route-length diagram or table identifying, for the worst-case, most-distant outlet or run in each distinct outlet-serving area served by that telecommunications room, including each separated wing, floor, or renovation zone reached through a different routed pathway, the routed path length used and its margin to the limit. A note that merely lists the serving telecommunications room for each outlet, without a stated worst-case routed length or an equivalent route-length exhibit, does not satisfy this requirement. On large or irregular renovation projects, provide the route-length exhibit for each affected

served area. Any outlet or area that cannot be served within the limit from the rooms shown shall be resolved — by adding or relocating a telecommunications room — before the project is issued for bid, so that a run exceeding the permitted length is not discovered in the field. Satisfying this criterion is a design responsibility administered under Section 27 05 00 §1.11.G; it is not satisfied by the Contractor's field verification under Section 27 15 00 §3.1, which is a construction-stage check of the layout shown.

B. Administrative and procedural requirements (submittals, substitutions, closeout, coordination) shall comply with Division 01 and the Contract Documents. In the event of conflict, the Contract Documents and Division 01 shall govern. Editorial note on structure: scope-boundary statements (that Division 27 terminates at the terminated jack) and the “pending confirmation” and design-review input requirements are stated within each affected system's clause rather than solely by cross-reference, so that each system section can be read, coordinated, and bid on a self-contained basis. This repetition is intentional; enforceable requirements are stated once in their governing section, and the Drawings, the Division 27 Project Schedule, and the non-contract coordination crib sheet carry project-specific quantities, prompts, and tracking rather than additional requirements.

C. Procurement compliance: Comply with applicable Commonwealth of Pennsylvania procurement requirements specified in Division 01 and the Contract Documents.

D. Systems not included in KU standard Division 27 scope: Distributed antenna systems (DAS), emergency responder radio coverage systems, public-safety radio enhancement systems, and similar in-building RF coverage systems are communications systems commonly specified in Division 27; they are not KU standard Division 27 scope and are not included in this Division unless expressly required by the Contract Documents. Where such a system is included in a project, the Drawings and the separate governing specification section shall define its cabling, pathway, rack space, power, grounding, monitoring, and Division 27 interface requirements before bid, and any Division 27 work supporting it shall be shown on the Drawings and on the Division 27 Project Schedule (§1.10.E).

1.2 DEFINITIONS

A. AHJ (Authority Having Jurisdiction): The organization or individual responsible for interpretation and enforcement of applicable codes, standards, and approvals.

B. KU IT Representative (Owner's IT Representative): Kutztown University Information Technology. On non-DGS projects KU is the Owner directly; “KU IT” and “the Owner's IT Representative” denote this same party. (Campus-specific designation.)

C. Data Center (KU) and campus network center: For purposes of this specification, 'Data Center' refers to the Data Centers located in the Stratton Administration Building, Kutztown University. The University's campus network center — the central serving location for campus voice and network infrastructure — is also located within the Stratton

Administration Building; references in this specification to the “campus network center” and to the Stratton Administration Building denote this same facility.

D. Contractor: The contractor responsible for the Division 27 Work under the Contract Documents, as assigned by the project’s contracting structure (for example, a single prime or general contractor that performs or subcontracts the Division 27 Work, or a communications contractor engaged directly by KU). Where a project is delivered under a multiple-prime structure, Division 27 is the electrical prime’s work unless the bidding documents assign it otherwise. All Owner-facing obligations of this Division — submittals, testing, closeout, coordination, and warranty registration — attach to the Contractor, who remains responsible for the work of its subcontractors.

E. Installer (Structured Cabling Installer): The manufacturer-authorized/certified entity performing the structured cabling Work, normally the Contractor's subcontractor. The Contractor shall perform the Work of this Division through an Installer meeting the qualifications of this Section.

F. Division 27 Project Schedule: The consolidated one-page drawing schedule required by Section 27 05 00, Paragraph 1.10.E, that assembles in one place the project-specific quantities and limits this specification defers to the Drawings. References in this Division to the “Division 27 Project Schedule” mean that schedule.

G. Abbreviations and acronyms (as used in this Division): CUCM — Cisco Unified Communications Manager (the University’s IP telephony call-control system); FXS — Foreign Exchange Station (the analog gateway port that supplies dial tone and line power to an analog telephone); IDF — Intermediate Distribution Frame (a telecommunications room serving a portion of a building); MDF — Main Distribution Frame (the primary telecommunications room of a building); OLTS — Optical Loss Test Set (Tier 1 fiber optical-loss testing); OSP — Outside Plant (cabling and pathways outside building walls, e.g., campus duct/manhole runs); TMGB — Telecommunications Main Grounding Busbar.

1.3 APPLICABLE CODES AND STANDARDS

A. Perform work in accordance with the edition of each applicable code and standard in effect on the Bid Date, together with any amendments then in effect, and the requirements of the AHJ. Where a referenced standard identifies a specific edition elsewhere in this Section, that edition governs for that reference. Where conflicts occur, comply with the Authority Having Jurisdiction (AHJ); the more stringent requirement shall govern unless a governing code adopted by the AHJ establishes precedence (e.g., PA UCC).

B. Applicable Standards (non-exhaustive):

1. ANSI/TIA-568 series – commercial building telecommunications cabling (copper and fiber).
2. ANSI/TIA-569 – telecommunications pathways and spaces.

3. ANSI/TIA-606 – administration / labeling for telecommunications infrastructure.
4. ANSI/TIA-607 – bonding and grounding (earthing) for telecommunications.
5. ANSI/TIA-598 – optical fiber cable color coding.
6. ANSI/TIA-758 – customer-owned outside plant (OSP) cabling.
7. NFPA 70 (NEC) – National Electrical Code, in the edition adopted under the PA UCC on the Bid Date.
8. Pennsylvania Uniform Construction Code (PA UCC), Title 34 Pa. Code Chapter 403 — Governing building code authority for projects. The edition of NFPA 70 (National Electrical Code) currently adopted under the PA UCC at the time of bid shall govern. Where a conflict exists between a referenced standard and the PA UCC, the PA UCC and its adopted codes shall prevail. The Contract Documents identify the adopted code basis; the Contractor shall comply with that basis and with AHJ interpretations issued during permitting and construction.

C. KU CAMPUS STANDARD PRODUCTS

1. Products and manufacturers identified in this Division are KU campus-standard products selected for compatibility with existing University infrastructure, supportability, warranty eligibility, maintainability, spare parts, labeling consistency, and operational continuity.
2. Provide the products, manufacturers, system families, and model numbers specified in this Division.
3. Product substitutions, alternates, and equivalent systems are not included in this KU campus-standard master unless expressly identified in the project Contract Documents before bid or procurement.
4. Where KU elects to use a product, manufacturer, or system family different from the KU campus-standard product identified in this Division, that deviation shall be identified in the project Contract Documents before bid or procurement and shall state the product, system family, or requirement being changed. Submittal review, coordination comments, and field discussions do not authorize product deviations unless the Contract Documents are formally revised under the applicable project procedures.

D. SINGLE-MANUFACTURER STRUCTURED CABLING SYSTEM

1. Provide a single-manufacturer structured cabling system for copper and fiber passive components, including cable, connectivity, patch panels, jacks, cords where specified, fiber enclosures/panels, and related system components required for warranty registration.

2. KU campus standard: Legrand/Ortronics structured cabling system with the Superior Essex cable products and Ortronics connectivity specified in this Division.

3. Components shall be furnished as a coordinated system family and shall qualify for the required manufacturer-registered structured cabling system warranty.

4. Use of another structured cabling system family is not included in this KU Standard master unless the project Contract Documents deliberately identify that deviation before bid or procurement.

E. PERFORMANCE HEADROOM / RESILIENCY (CATEGORY 6A) 1. Provide a Category 6A copper cabling system meeting applicable ANSI/TIA Category 6A requirements (500 MHz). 2. Resiliency Intent: The Category 6A system is intended to provide margin above the minimum standard so that installed links tolerate real-world installation variables (e.g., pathway congestion, bundle interaction, and minor handling variation) and still pass with margin to the applicable ANSI/TIA-568 Category 6A limits. This margin is established and verified as follows: (a) the cable and connectivity are a Category 6A system fully compliant with ANSI/TIA-568 across the specified frequency range; (b) the system is eligible for the manufacturer's registered Category 6A system warranty (Paragraph D); and (c) the installed permanent links are field-tested and report positive margin to the ANSI/TIA-568 Category 6A limits on the reported parameters (including NEXT, return loss, and insertion loss), per Section 27 08 00. Field-test margin to the standard is the governing evidence of resiliency; it is verified on the installed link, against the published standard, and does not depend on any single manufacturer's above-standard characterization. Positive margin means a passing permanent-link test result, obtained using a field tester and permanent-link adapter set certified or approved by the tester manufacturer for the applicable ANSI/TIA Category 6A permanent-link limit, with no parameter reported as a failure. 3. Supporting Evidence (informative): Manufacturer-published channel/permanent-link performance margin or headroom information above the applicable Category 6A requirements, and any above-standard characterization (for example, swept data above 500 MHz), may be provided as supporting evidence of system quality. Such manufacturer literature is informative and is not by itself an acceptance or rejection basis; acceptance of performance is established by compliance with the ANSI/TIA-568 Category 6A standard, warranty eligibility (Paragraph D), and the field-test margin required by Paragraph E.2 and Section 27 08 00. Where provided, such literature shall be specific to the proposed product/system and identify the applicable test standard or performance basis. 4. Optional Supporting Evidence (if provided): Third-party verification (e.g., ETL/Intertek or equivalent) indicating above-standard performance margin and/or alien crosstalk immunity, and/or manufacturer-published cable or system characterization above 500 MHz (e.g., 550 MHz or greater). 5. System Warranty and Installer Authorization: Provide a single-manufacturer structured cabling system eligible for the manufacturer's registered system warranty, and install it using a manufacturer-

authorized/certified Installer eligible to register the specified warranty. Submit written confirmation of warranty eligibility and installer authorization with submittals.

F. PROJECT-SPECIFIC PRODUCT DEVIATIONS

1. This KU Standard master does not include alternate-product or equivalent-product procedures. Products listed in this Division are the KU campus-standard products for non-DGS projects.
2. Where KU elects to use a product, manufacturer, or system family different from the KU campus-standard product identified in this Division, the project Contract Documents shall identify the deviation before bid or procurement.
3. The Contractor shall not treat submittal review, coordination comments, field discussions, or Contractor preference as authorization to deviate from the KU campus-standard products identified in this Division.
4. Where a documented project-specific deviation is included in the Contract Documents, provide product documentation sufficient to demonstrate that the changed product satisfies the technical, performance, warranty, labeling, testing, documentation, maintainability, and operational requirements stated in this Division.

1.4 OWNER-FURNISHED NETWORK ELECTRONICS (ACTIVE EQUIPMENT)

- A. Network electronics (active equipment) including but not limited to switches, routers, wireless access points, controllers, security appliances, optics/transceivers, and UPS systems shall be Owner furnished unless specifically noted otherwise in the project documents.
- B. Rack PDUs and power strips installed within racks remain Contractor furnished and Contractor installed unless specifically noted otherwise.
- C. Contractor responsibilities include racks/cabinets and support infrastructure, pathways, terminations, labeling, testing, and coordination of rack layout, mounting provisions, grounding, and electrical receptacle placement required to support Owner-furnished equipment.
- D. Where Owner-furnished equipment is to be installed by the Contractor, the project documents shall identify it as OFCI (Owner Furnished, Contractor Installed).
- E. Connection to the University network: The Contractor shall not connect any device, equipment, or cabling to the University network — including network electronics, wireless access points, computers, servers, test or monitoring equipment, and temporary or personal devices — and shall not make use of any active network port, without prior written authorization from KU IT. This applies to Owner-furnished active equipment installed under this Division, which is configured and placed in service by KU IT under Section 27 08 00, as well as to the Contractor's own equipment. Use of cable test equipment on installed links that are not connected to active network electronics, as required by Section 27 08 00, is not a connection to the University network for purposes of

this Paragraph. Where the Contractor requires network or internet access for its own use during construction, it shall be requested through the Owner's project manager and KU IT.

1.5 PRE-INSTALLATION MATERIALS REVIEW MEETING

- A. Prior to commencement of work, the Contractor, through its structured cabling Installer, shall participate in a materials review and coordination meeting with the KU Project Manager (Owner Representative), KU IT, and other primes (including the General Contractor) as applicable.
- B. Meeting shall occur a minimum of one (1) week prior to the start of installation work.
- C. The Contractor shall not commence installation of Division 27 materials until required submittals and product data have been reviewed in accordance with Division 01 submittal procedures and the pre-installation coordination meeting has occurred.

1.6 BID QUALIFICATION – CERTIFICATION AND EXPERIENCE

- A. The Contractor shall be licensed (where required) and bonded in the Commonwealth of Pennsylvania as required by the Contract Documents. The structured cabling Installer shall be licensed where required and shall hold the manufacturer authorization/certification specified in this Section.
- B. Structured Cabling Installer Authorization: The Contractor shall submit evidence that the Installer holds current manufacturer authorization/certification to furnish and register the specified structured cabling system warranty. For the KU campus-standard system (Legrand/Ortronics nCompass), provide current documentation demonstrating Installer status required to register the applicable nCompass warranty. For an approved project-specific deviation, provide equivalent documentation from the proposed manufacturer confirming the Installer is authorized to register an equivalent system warranty.
- C. The Contractor shall ensure the Installer has experience in the installation and testing of similar systems and has completed at least two (2) projects of similar size and scope within the last twenty-four (24) months. Provide references upon request including project name, address, date of implementation, client name, title, telephone number, and brief project description.

1.7 INSTALLER QUALIFICATIONS (MANUFACTURER-AUTHORIZED INSTALLER + CERTIFIED ON-SITE LEAD)

- A. On-site Supervision: The Contractor shall ensure the Installer provides a dedicated on-site working foreman/superintendent present whenever Division 27 cabling work is performed.
- B. On-site Lead Credentials: The Contractor shall ensure the Installer's on-site foreman (the lead present during the Work) holds, appropriate to the work being performed, either (1) a current BICSI Installer 2 credential appropriate to the work, Copper or Optical Fiber (as of this writing, Installer 2, Copper (INSTC) or Installer 2, Optical Fiber (INSTF)), or a current

BICSI Technician credential (as of this writing, Technician (TECH)); or (2) the current lead-installer or lead-technician certification issued by the manufacturer of the structured cabling system being installed for that system. Where BICSI credential titles or abbreviations change, the current BICSI credential of equivalent level and scope satisfies this requirement. This requirement applies to the on-site lead only; this Section does not require a fixed proportion of the installation crew to hold certification. The manufacturer-authorized-installer requirement for the system as a whole, and the warranty-registration requirements, are stated separately in this Section and continue to apply.

1.8 TERMINATION STANDARDS (COPPER AND FIBER)

- A. Copper Terminations: Terminate all balanced twisted-pair copper outlets, jacks, and patch panels using T568B pin/pair assignments. Do not mix T568A and T568B terminations within a horizontal link or channel.
- B. Copper Standards: Copper installation, termination, and testing shall comply with the ANSI/TIA-568 series (edition in effect on the Bid Date) and manufacturer instructions.
- C. Fiber Terminations: Fiber optic installation and termination shall comply with ANSI/TIA-568 series (edition in effect on the Bid Date) including ANSI/TIA-568.3 (fiber components) and ANSI/TIA-598 (fiber color coding). Maintain polarity per manufacturer and project requirements.

1.9 ABANDONED CABLING (RENOVATIONS / DEMOLITION – PROJECT AREA)

- A. Definition: For purposes of this specification, abandoned communications and optical fiber cabling is cabling that is not terminated at equipment (other than a termination fitting or connector) and is not identified for future use.
- B. Scope Limitation: Except as provided in Paragraphs F and G, requirements of this paragraph apply only to accessible spaces within the project work area and to cabling made abandoned by the Work.
- C. Removal or Tagging: The accessible portion of abandoned communications and optical fiber cabling shall be removed, unless specifically identified for future use with a durable tag. Tagging for future use shall be coordinated with KU IT and documented in the closeout deliverables.
- D. Verification Prior to Work: Prior to commencing any demolition or removal work related to communications systems, the Contractor shall walk the affected areas with KU IT to confirm demolition limits, identify any cabling to remain, and confirm any cabling to be tagged for future use.
- E. Demolition Hold Point: Do not remove, cut, disconnect, or abandon any existing communications cabling, patch panels, fiber enclosures, or associated pathways/hardware

until demolition scope, limits, and sequencing have been reviewed with and approved by KU IT.

F. Backbone and Outside Plant (OSP) Cable Removal — Extent:

1. Complete removal between terminating points: Where backbone or campus OSP cabling is removed or made abandoned by the Work, remove the cable in its entirety between its terminating points (enclosure/termination point to enclosure/termination point), including all intermediate duct bank, innerduct, manhole, handhole, and vault segments. Removal shall not stop at the building entrance, the nearest manhole, or the boundary of the project work area. Manholes, handholes, vaults, innerduct, and similar pathway elements are accessible locations for purposes of Paragraph C.
 2. Project-specific removal extent: The extent of removal for each project — including the specific cable segments to be removed, the far-end termination point, and whether removal work in a building outside the project work area is included in this Contract — shall be determined by KU IT on a project-by-project basis, identified on the Drawings, and confirmed at the demolition hold point in Paragraph E.
 3. Abandonment in place only by written determination: Where KU IT determines that complete removal is not feasible, the affected cable shall be identified for future use or abandonment in place by written determination of KU IT and durably tagged at each accessible location per Paragraph C.
 4. Restoration and far-end locations: Restore pathways, penetrations, seals, and affected surfaces in accordance with Paragraph H. Where the removal extent defined on the Drawings includes a termination point, telecommunications room, or other space outside the project work area (including a far-end building), the Work at that location includes removal of the cable and its obsolete terminating hardware per Paragraph G, sealing/firestopping of any resulting penetrations or sleeves in accordance with Section 27 05 28, and restoration of the affected space, wall, rack, and finishes to their existing condition. Restoration at such locations is included in this Contract only to the extent the Drawings identify that location as within the removal extent; the Drawings shall state whether removal and restoration work in a building outside the project work area is included in this Contract.
 5. Closeout and pathway coordination: Record removed cable segments, retained (tagged) segments, and reclaimed pathway/innerduct capacity in the closeout deliverables per Section 27 08 00, and coordinate with the pre-pull pathway condition assessment in Section 27 13 00 §2.3.G where new cable is pulled through the same pathways.
- G. Obsolete Terminating Hardware — Removal and Rack Space: Where cabling is removed or made abandoned by the Work, also remove the terminating hardware serving only that cabling and made obsolete by the Work — including fiber optic housings/enclosures and adapter panels (for example, legacy rack-mount fiber housings serving removed ST-terminated backbone fiber), patch panels, termination blocks, and associated mounting hardware — and

reclaim the rack units, wall space, and pathway occupied by them. Blank or trim the resulting rack openings as coordinated with KU IT under Section 27 05 00 §1.11.D, and patch, seal, and restore any wall, backboard, or finish surface disturbed by the removal of wall-mounted housings, backboards, or termination hardware, at each location where the hardware is removed (including any far-end or out-of-work-area location identified within the removal extent per Paragraph F). Do not remove hardware that serves cabling remaining in service or cabling tagged for future use. The extent of hardware removal shall be determined by KU IT on a project-by-project basis, identified on the Drawings, and confirmed at the demolition hold point in Paragraph E. Record reclaimed rack units and removed hardware in the closeout deliverables per Section 27 08 00.

H. Restoration and Protection After Removal: Wherever cabling or terminating hardware is removed under this Section, the Contractor shall restore the affected pathways, penetrations, and spaces to a clean, sealed, and usable condition. Restoration is incidental to the removal work and applies at every location within the removal extent defined on the Drawings, including far-end and out-of-work-area locations identified per Paragraph F.

1. Pathway condition: Leave duct, innerduct, manholes, handholes, vaults, building entrances, sleeves, and penetrations clean, passable, and usable for future cable placement.
2. Debris removal: Remove all removal debris from the site. Do not leave abandoned cable scraps, cut cable ends, pull rope, abandoned mule tape, tags, hardware remnants, packaging, or trash in manholes, handholes, vaults, innerduct, ducts, ceilings, or telecommunications rooms.
3. Firestopping and rated assemblies: Where removed cabling passed through fire-rated walls, floors, ceilings, sleeves, or other rated assemblies, restore the firestop system to its listed condition, or seal the sleeve or opening, in accordance with Section 27 05 28 and the listed system requirements. Do not leave an unsealed sleeve or an unrestored firestop penetration.
4. Weather, water, and pest sealing: Restore weather-tight, water-resistant, and insect/rodent-resistant sealing at building entrances, conduit and duct entries, vault and manhole penetrations, and exterior wall/building-envelope penetrations disturbed by the removal, using duct sealant/plugs and materials suitable for the environment and consistent with the original construction.
5. Protection of remaining plant: Protect all cabling, innerduct, hardware, and pathways remaining in service, and cabling tagged for future use, during removal and restoration. Verify occupied pathways and identify cables to remain prior to any pull or cut. Damage to existing communications plant caused by the Work shall be repaired or replaced to the condition and performance existing prior to the damage, at no additional cost to the Owner, and the affected cabling shall be re-tested in accordance with Section 27 08 00.

6. Innerduct usability: Where innerduct is cut, displaced, crushed, pulled loose, deformed, or left obstructed by the removal, repair, replace, re-secure, or re-rod the innerduct as coordinated with KU IT under Section 27 05 00 §1.11.D so that it remains usable for future cable placement. Provide pull rope/mule tape in innerduct left vacant by the removal where directed by KU IT.
7. Closeout documentation: Record in the closeout deliverables per Section 27 08 00 the cable segments removed; segments retained and tagged for future use; pathway, duct, and innerduct capacity reclaimed; rack units reclaimed per Paragraph G; and the restoration, sealing, and firestopping performed at each location, including any repairs to existing plant.
- I. Existing communications service to remain in service during construction: Renovation work often occurs in buildings containing communications cabling that must continue to operate, including cabling that serves other buildings and does not serve the project building at all. Damage to such cabling interrupts service outside the project boundary.
 1. Identification before bid: The Professional, with KU IT, shall identify on the Drawings and in the Division 27 Project Schedule (§1.10.E) the existing communications cabling and pathways that must remain in service during construction, including (a) backbone or outside-plant cabling that passes through or terminates in the project building and serves other buildings or campus systems; (b) cabling serving occupants who remain in the building or in an adjoining area during any phase of construction; and (c) cabling to be reused after renovation.
 2. Field marking: The Contractor shall mark the cabling identified under sub-item 1 along its accessible length at intervals not exceeding three (3) feet, on both sides of each penetration, and within each telecommunications room, ceiling space, and shaft it occupies, using durable tags, labels, or marked caution tape reading substantially: LIVE COMMUNICATIONS CABLE — DO NOT CUT — CONTACT KU IT. Marking shall be complete before demolition, abatement, or other trade work begins in the affected area. Where such work is scheduled to precede the Contractor's mobilization, marking shall be performed as an early activity and its timing confirmed at the pre-construction meeting.
 3. Protection across trades: Cabling identified under this Paragraph is commonly encountered by trades other than Division 27, including demolition and abatement. The requirement that identified cabling not be cut, disconnected, or relocated without prior written KU IT authorization shall be carried into the General Requirements (Division 01) so that it applies to all contractors on the project, including under separate prime contracts. The hold point of Paragraph E applies to the Work of this Division.
 4. Temporary service where cabling cannot be preserved: Where cabling identified under sub-item 1 cannot be preserved in service through construction and occupants remain in the building or in an adjoining area, temporary communications service shall be installed, tested, accepted by KU IT, and the affected users cut over to it before the existing serving

cabling, telecommunications room, or pathways are demolished or taken out of service. Where the identified cabling can be preserved in service, temporary service is not required under this Paragraph.

5. Damage and notification: Damage to cabling identified under this Paragraph shall be reported to KU IT and the Professional immediately upon discovery, and restoration of the interrupted service takes precedence over other sequencing. Where the damage arises from the Work of this Division, repair or replacement shall be performed to the requirements of this Division and to KU IT's acceptance at no additional cost to the Owner.

J. Ownership and disposition of removed cabling and hardware: Except as Division 01 or the General Conditions provide otherwise, which govern, cabling, terminating hardware, and equipment removed under this Section shall be handled as follows:

1. Contractor property and disposal: Removed cabling, terminating hardware, and equipment become the property of the Contractor. The Contractor shall remove such material from the site and lawfully dispose of or recycle it at no additional cost to the Owner and with no salvage credit due to either party.

2. Owner-retained items identified before bid: Where the Owner intends to retain particular removed cabling, terminating hardware, or equipment — for example fiber enclosures, patch panels, or other reusable hardware — those items shall be identified before bid on the Drawings with the demolition and removal scope under Paragraph F, so that turning them over rather than removing them from the site is a priced requirement. Retained items shall be turned over to the Owner as directed and handled in accordance with applicable University and Commonwealth surplus-property procedures.

3. No mid-construction election: Removed material not identified before bid for Owner retention is the Contractor's property under this Paragraph, and no mid-construction election or notification is required.

K. Concealed or undocumented existing communications infrastructure discovered after bid: This Paragraph addresses existing communications cabling, pathways, or terminating hardware that was not identified before bid and is discovered during construction — for example concealed, mislabeled, or undocumented cable found in a wall, ceiling, or pathway — as distinct from the identified, in-service cabling protected under Paragraph I. Upon discovering such infrastructure, the Contractor shall not cut, remove, or re-route it; shall protect it in place; and shall promptly document its location and apparent system and notify KU IT and the Project Manager. Whether the discovered infrastructure is active, abandoned, to be removed, or to be retained is determined by KU IT; and where resolving the discovered condition affects the scope, cost, or time of the Work, it is handled under the Division 01 change process. Consistent with Section 27 05 00 §1.11, a KU IT determination

or instruction regarding discovered infrastructure does not by itself change the Contract Sum or Contract Time except as issued under Division 01.

1.10 DESIGN-REVIEW COORDINATION AND LIMITED/SPECIALTY COMMUNICATIONS INPUT REQUESTS

The KU IT decision-authority and coordination categories referenced throughout this Paragraph — campus-standard decisions made before bid, submittal and product review for conformance, field coordination, and post-award changes — are defined in §1.11 (KU IT Coordination and Decision Authority).

A. Purpose: Certain limited and specialty communications scope — limited analog telephone endpoints (emergency telephones, building entrance vestibule emergency telephones, elevator telephone lines, and similar limited analog emergency endpoints, including area of refuge / area of rescue assistance two-way communication where served by an analog line), fire alarm interface backbone fiber, electronic access-control and IP-based electronic-security device network connectivity, Building Automation System (BAS) / integrated automation network connectivity, and similar Owner- or life-safety-driven scope — depends on requirements that originate outside Division 27 (the Professional, the fire alarm vendor / Division 28, the elevator contractor, the security / access-control designer, the controls / BAS designer (Divisions 23/25), and the life-safety / area-of-refuge designer). Division 27 cannot establish these requirements unilaterally.

Campus answering-point standard: Limited analog emergency endpoints on this campus (emergency telephones, building entrance vestibule emergency telephones, elevator telephone lines, and similar limited analog emergency endpoints) are configured so that activation (“red button”) places a call to a University Police Department (KUPD) campus extension, served through the Owner-furnished analog voice gateway and the University’s CUCM/VoIP environment. KUPD is a constantly-attended on-campus answering point, and these endpoints dial on-campus only; no off-premises automatic dial-out to an external monitoring location is provided. Because the call path is VoIP beyond the gateway, operability during loss of normal building power depends on emergency/standby power for the entire powered call path (gateway and UPS, serving switches, and building uplink/aggregation), coordinated under Division 26 and Section 27 32 26 §2.1.G — not on the passive copper alone.

B. Design-review input requests (hold point): At each design-review milestone established for the Project, the Professional shall solicit, and the responsible parties shall provide in writing, the Division 27-affecting requirements in Paragraph C. Design-review milestones are those established for the Project, such as Schematic Design, Design Development, Interim Construction Documents, or other percentage-based milestone submissions used by the project. Solicit these inputs beginning at the earliest design stage at which they can be identified, and confirm them before the project is issued for bid or procurement. Division 27 quantities, strand counts, survivability provisions, and pathways that depend on these

inputs shall be confirmed and shown on the Drawings; they shall not be left to bid-time assumption or to a Division 27 campus-standard default.

C. Specific inputs required at design review:

1. Limited analog telephone endpoints (emergency telephones — including building entrance vestibule emergency telephones — and elevator telephone lines): Confirm the count and locations and the serving option per Section 27 32 26 §2.1.F. The campus answering point is a KUPD extension per Paragraph A; confirm any project-specific exception with KU IT and University Police. For each endpoint, confirm whether operability during loss of normal building power is required and, if so, the survivability method per Section 27 32 26 §2.1.G, including whether this project provides generator/standby power for the gateway call path (Division 26). Show endpoint locations, counts, and the serving option on the Drawings rather than adding them by assumption at markup.

a. Building entrance vestibule emergency telephones: Confirm the intended function (general emergency/help telephone vs. University Police / security telephone), since the function and KUPD direction drive the survivability and monitoring expectations. Coordinate with University Police and the Professional.

b. Elevator telephone lines: Confirm the number of lines and the Division 27 demarcation at the elevator machine/control room, and coordinate handoff to the elevator contractor, who makes the final connection to the elevator car telephone. Where elevator phone operability during power loss is required, coordinate standby power for the gateway call path per Paragraph A and Section 27 32 26 §2.1.G.

2. Area of Refuge / Area of Rescue Assistance two-way communication: Confirm whether the system is included; whether it is served by a Division 27-provided analog line and, if so, for what function (call-station service vs. off-premises timed dial-out per NFPA 72); the required call-path survivability / standby-power expectation; the pathway-survivability classification where applicable; and the division responsible for the system, its master station/head-end, monitoring, and listing (UL 2525). The area of refuge two-way communication system, its standby power, and its pathway survivability are Division 28 / life-safety scope; Division 27 provides only the passive cabling/pathway expressly directed, and any Division 27-provided analog endpoint shall have its power-fail survivability method selected per Section 27 32 26 §2.1.G. Where an area of refuge system is instead served as a Division 27-provided analog endpoint dialing a KUPD extension (rather than a self-contained Division 28 system), the campus answering-point and power-fail provisions of Paragraph A and Section 27 32 26 §2.1.G apply; confirm the approach with the life-safety designer, Division 28, and University Police.

3. Fire alarm interface backbone fiber: Confirm whether fire alarm backbone fiber is required for this project, and the strand count, connector type (SC or ST), and field-housing locations, per Section 27 13 00 §2.2.D–H and Division 28. Division 27 shall request written confirmation of these requirements at each design-review milestone; where confirmation has not been

received, Division 27 shall identify the fire alarm backbone fiber requirements as pending confirmation in its design-review submissions so the open item remains visible and can be resolved before the project is issued for bid.

4. Electronic access control:

a. Required input: Confirm the location(s) — which shall be outside telecommunications rooms in accordance with Section 27 11 00 §1.1.A — and network (Category 6A) drop count for the access-control controller(s)/panel(s) that require network connectivity to the access-control head-end/server (for example, a building master access-control controller/panel), and the head-end/server location.

b. Devices not requiring individual Division 27 drops: Door readers, electric locks, request-to-exit and door-position devices, and similar door hardware are hardwired to the controller or, in larger installations, to intermediate door/sub-panels that are themselves hardwired to the master controller; these components and any such hardwired sub-panels, together with the access-control system and its head-end, are furnished and installed under Division 28 (Electronic Safety and Security), and do not require individual Division 27 network drops.

c. Division 27 scope boundary: Division 27 provides and terminates the structured cabling (Category 6A) to the controller/panel location on a jack/patch panel, and its scope ends at that terminated jack, consistent with the audio-video boundary in this specification.

d. IP-networked edge devices: Where a project's access-control design instead uses IP-networked or PoE edge devices that require their own network connections, confirm those device locations, drop counts, and PoE class as well.

e. Drawing and pending-confirmation requirement: Coordinate with the security / access-control designer and Division 28, and reflect confirmed drop counts and locations on the Drawings; where confirmation has not been received, Division 27 shall identify these requirements as pending confirmation in its design-review submissions so the open item remains visible and can be resolved before the project is issued for bid.

5. Building Automation System (BAS) / integrated automation:

a. Required input: Confirm the location(s) — which shall be outside telecommunications rooms in accordance with Section 27 11 00 §1.1.A — and network (Category 6A) drop count for BAS devices that require network connectivity, together with any Power-over-Ethernet (PoE) requirement and class.

b. Examples of network-connected BAS devices: Confirm requirements for supervisory controllers, network area controllers / gateway devices (such as JACE-type controllers), plant and air-handling controllers provided with an IP network port, BAS operator workstations, and any BAS head-end/server location.

c. Devices not requiring individual Division 27 drops: Field-level unit controllers, VAV/terminal-unit controllers, sensors, actuators, and similar devices that communicate over the BAS field bus (for example, BACnet MS/TP or equivalent) are hardwired to their supervisory/network controller and, together with the BAS and its head-end, are furnished and installed under Division 25 (Integrated Automation) or Division 23 (HVAC) as indicated in the Contract Documents; they do not require individual Division 27 network drops.

d. Division 27 scope boundary: Division 27 provides and terminates the structured cabling (Category 6A) to each network-connected BAS device location on a jack/patch panel, and its scope ends at that terminated jack, consistent with the audio-video boundary in this specification.

e. Drawing and pending-confirmation requirement: Coordinate with the Professional, the controls/BAS designer, and Divisions 23/25, and reflect confirmed drop counts and locations on the Drawings; where confirmation has not been received, Division 27 shall identify these requirements as pending confirmation in its design-review submissions so the open item remains visible and can be resolved before the project is issued for bid.

6. Video surveillance (CCTV):

a. Required input: Confirm the camera locations and counts, the serving telecommunications room and outlet Class for each camera location, and — for each camera location outside the building envelope — the Power-over-Ethernet type/class serving the camera, with the security designer, KU IT, and Division 28, so that each camera location appears on the Drawings and is included in the outlet counts and the Division 27 Project Schedule (§1.10.E), and so that the surge protective devices required by Section 27 05 26 §3.1.D can be selected, shown, and counted before bid.

b. Division 27 scope boundary: Division 27 provides and terminates the structured cabling (Category 6A) to each camera location on a jack/patch panel, and its scope ends at that terminated jack, consistent with the audio-video boundary in this specification. Cameras, mounts, licensing, configuration, and integration into the University video management system are specified under Section 28 23 00 (Video Surveillance) and furnished and installed under Division 28.

c. Exterior/exposed camera locations: Identify which camera locations are outside the building envelope (exterior-mounted, on poles, canopies, parking areas or site structures, or served by runs extending between structures), together with the Power-over-Ethernet type/class confirmed under Subparagraph a, so that the surge protection and bonding required by Section 27 05 26 §3.1.D is shown on the Drawings and its quantities are carried in the Division 27 Project Schedule (§1.10.E) rather than determined in the field.

d. Drawing and pending-confirmation requirement: Coordinate with the security designer, KU IT, and Division 28, and reflect confirmed camera locations and counts on the Drawings; where confirmation has not been received, Division 27 shall identify these requirements as pending confirmation in its design-review submissions so the open item remains visible and can be resolved before the project is issued for bid.

D. Documentation: The Professional shall document the responses (or the absence of response) at each design-review milestone and reflect confirmed requirements on the Drawings and in the design-review counts before the project is issued for bid.

E. Division 27 Project Schedule: The Drawings shall include the Division 27 Project Schedule — a single consolidated one-page table or schedule sheet — that assembles, in one place, the project-specific quantities and limits this specification defers to the Drawings, so they can be audited at a glance rather than reconstructed from multiple sheets and sections. At minimum the schedule shall list, for the project: the serving telecommunications room (TR) for each outlet or area; outlet Classes and counts; installed Category 6A copper DATA patch-panel port totals and DATA outlet counts (the quantity bases for Contractor-provided copper patch cords per Section 27 15 00 §2.5.B); wireless access point (AP) locations and counts, with the ceiling type and construction at each AP location per Section 27 21 33 §1.2.C; video surveillance camera outlet locations/counts per Section 27 05 00 §1.10.C.6; fiber runs by media type (OS2 / OM4 / OM1) with strand counts by run, and terminated fiber link/port counts by media type (the quantity basis for Contractor-provided fiber patch cords per Section 27 15 00 §2.5.D); OSP run schedule and routes; limited analog telephone endpoint locations and counts with the analog gateway FXS port count and the selected Section 27 32 26 §2.1.F serving option; electronic access-control controller/panel network (Category 6A) drop locations and counts (§1.10.C.4); Building Automation System (BAS) network (Category 6A) drop locations and counts (§1.10.C.5); any Division 27 interface work supporting an RF coverage system identified in §1.1.D (distributed antenna system, emergency responder radio coverage system, public-safety radio enhancement system, or similar) where such a system is expressly included by the Contract Documents; runway/pathway extent; and, where the project includes demolition or removal of existing communications cabling, the backbone/OSP cable removal extent and far-end termination point, the obsolete terminating hardware to be removed, and the associated restoration scope (Section 27 05 00 §1.9.F–H). The Division 27 Project Schedule is a compilation and audit aid; it does not add scope, and it does not supersede the governing sections. Where the Division 27 Project Schedule and a governing section conflict, the governing section and the Contract Documents control. Its purpose is to ensure that no bid quantity this specification defers to the Drawings is left to “as required” or “where indicated” interpretation. Where the schedule lists patch-cord quantities, those quantities shall follow the governing rule of Section 27 15 00 §2.5 — telecommunications-room / switch patch cords are based on the number of installed data patch-panel ports, not on the number of outlets or cables terminated — so that cord quantities and the required patch-panel spare capacity remain consistent and are not derived from outlet counts.

F. Changes after bid (conformance of modified Work): Where the Work is modified after the Bid Date — by change order or otherwise — any communications cabling that is added, relocated, or altered by that modification shall conform to the media standards, the identification and labeling scheme, the testing and documentation requirements, and the coordination discipline of this Division, the same as originally-bid Work, unless the change authorization expressly provides otherwise. The process for authorizing, pricing, and scheduling a change is governed by the General Requirements (Division 01) and the General Conditions and is not modified by this Paragraph. A modification that would introduce communications cabling not on the approved media list of this Division — for example a fiber type or category other than the campus-standard media — shall not be authorized to deviate from that list without the concurrence of KU IT, because KU IT is responsible after acceptance for the continued operation of the affected system on the University networks; where KU IT concurs in a deviation, the deviation and its basis are recorded in the change authorization. This Paragraph establishes the technical standard that modified communications Work must meet; it does not enlarge the Contractor's scope beyond the modification authorized under Division 01.

1.11 KU IT COORDINATION AND DECISION AUTHORITY

- A. Purpose: This Paragraph establishes how KU IT participates in the Work so that the Professional and the Contractor can distinguish campus-standard decisions made before bid from submittal review, field coordination, and post-award changes. Except as provided in Paragraph F, nothing in this Division that requires coordination with, review by, or a decision from KU IT enlarges the Work, transfers the Contractor's responsibilities, or changes the Contract Sum or Contract Time.
- B. Campus-standard and topology decisions (made before bid): Where this Division states that a campus standard, serving topology, media type, strand count, quantity, identifier scheme, or similar project-specific requirement is as designated, determined, indicated, or confirmed by KU IT, that determination is a campus-standard decision KU IT makes before the project is issued for bid and that the Professional incorporates into the Drawings, schedules, and the Division 27 Project Schedule (§1.10.E). Such decisions shall not be deferred to the construction phase.
- C. Submittal and product review (conformance only): Where this Division requires a submittal, sample, layout, or proposed project-specific deviation to be reviewed or approved by KU IT, that review is for conformance with the campus standards and the Contract Documents only. Review or acceptance by KU IT does not relieve the Contractor of compliance with the Contract Documents or of responsibility for errors or omissions in the submittal. Where KU IT does not accept a proposed item, KU IT shall identify the specific requirement(s) not met in writing.

Note — Outage and access windows: Where communications work requires a network or service outage, after-hours work, or restricted access in an occupied building that affects pricing or schedule, those requirements are identified in the General Requirements (Division 01) or on the Drawings; scheduling and authorization of outages and access are administered under Division 01, not by this Division.

D. Field coordination (means, methods, safety, and schedule unchanged): Where this Division requires the Contractor to coordinate with KU IT — including placement, routing, elevations, slack, labeling identifiers, pull routes, work-area access, and similar field matters — the Contractor remains solely responsible for construction means and methods, site and work-zone safety, sequencing, and schedule. Such coordination establishes the Owner's operational requirements and access constraints and does not place KU IT in control of the Contractor's work.

E. Owner-performed and Owner-furnished activities: Certain activities are performed by KU IT or involve Owner-furnished active equipment — for example, operational (dial-tone) verification, gateway configuration, network switch patching, and equipment activation. Except where expressly stated as a condition of acceptance, completion of an Owner-performed or Owner-furnished-equipment activity is not a precondition to acceptance of the Contractor's Division 27 cabling Work.

F. Changes after bid: A KU IT decision, review comment, or coordination instruction that would change the scope of the Work, the Contract Sum, or the Contract Time is effective only when issued as a written change authorization under Division 01. Absent such authorization, KU IT direction operates within the scope already shown in the Contract Documents.

G. Precedence and administration of design and coordination responsibilities: The design and coordination responsibilities identified in this Article and elsewhere in this Division — including telecommunications-room location and count (Section 27 11 00 §1.1) and the design-review inputs and confirmations of Paragraph C and this Article — are administered under the Owner's agreement with the Professional and the General Requirements (Division 01) where those documents address them. To the extent those documents do not address a given responsibility, the requirements stated in this Division establish the Owner's criteria for the Work and for the design of the Work. Nothing in this Article is intended to impose a contractual obligation on a party that is not a party to the Contract, to make the Owner or KU IT the designer of record, or to relieve the Contractor of its obligations under the Contract Documents. Where this Division states a design criterion in terms of what the Drawings or Contract Documents shall show or achieve, that criterion describes the documents from which the Contractor bids and is satisfied through the design, not by the

Contractor, except where this Division expressly assigns a verification or installation duty to the Contractor.