PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Scope of Work
B. Codes and Specifications
C. General Requirements and Conditions
D. Qualifications of Subcontractors
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1.2 RELATED SECTIONS

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B. Section 07270 - Firestopping
C. Section 16715 - Acceptance Testing
D. Section 16720 - Basic Materials and Methods
E. Section 16725 - Telecommunications Cable
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H. Section 16760 - Telecommunications Grounding and Bonding

1.3 SCOPE

A. Scope of Work

(1) The scope of work includes the design, provision, installation, testing, and documentation of physical resources for voice, data, video, campus voice switch extension, specialty data systems and call box interconnection required by the construction documents. Work includes placement and termination of all cable and equipment for termination of all incoming outside plant copper and fiber optic cable systems, intrabuilding Category UTP station cabling to the 110 station cable termination fields and coaxial station cable systems to and including the rack mounted connector systems. Voice system cross connect from station cable 110 fields to building riser, building entry protection, specialty systems are included. Data patch cables, from 110 station cable fields and electronics equipment will be the provided by the Campus.
(2) The Contractor will provide all labor, materials, tools, equipment, and permits necessary for the satisfactory and timely completion of the project.

(3) The Contractor and Trustees/University shall jointly implement this project such that it meets the technical requirements of the construction documents and employs all consideration necessary to create minimum impact on the campus operations and academic environment.

B. Construction Coordination

(1) The work includes, but is not limited to, the items outlined in these construction documents, as well as all incidental items and design required to provide complete and operable systems. The Trustees/University and the Contractor shall mutually agree on the general conduct of the work prior to initiation of construction and shall each be responsible for following these general guidelines throughout the construction period unless modified in writing based upon discussions at the project coordination meetings.

1.4 CODES AND SPECIFICATIONS

A. All work shall be performed in compliance with the most restrictive of Municipal, State, and/or Federal Codes which may govern this work and shall conform to the following codes and specifications:

(1) National Fire Protection Association
   (a) NFPA 70-1990 National Electric Code.
   (b) NFPA 101 - Life Safety Code.
   (c) NFPA 258 - Standard Test Method for Measuring Smoke Generated by Solid Materials.

(2) ANSI Specifications:
   (b) ANSI C80.3 Specification for Zinc-coated Electrical Metallic Tubing.
   (c) ANSI/UL 797 Electrical Metallic Tubing.

(3) Electronics Industry Association/Telecommunications Industry Association (EIA/TIA):
   (a) EIA/TIA 568B.1 – General Requirements
       EIA/TIA 568B.2 – 100-Ohm Balanced twisted Pair Cabling Standard
   (b) EIA/TIA 569 - Commercial Building Standard for Telecommunications Pathways and Spaces.
   (c) EIA/TIA TSB 36 - Technical Systems Bulletin Additional Cable Specifications for Unshielded Twisted Pair Cables.
(d) EIA/TIA TSB 67 - Transmission Performance Specifications for Field Testing of Unshielded Twisted-Pair Cabling Systems.
(e) EIA/TIA TSB 72 - Centralized Optical Fiber Cabling Guidelines.
(f) EIA/TIA 75 – Additional Horizontal Cabling Practices for Open Offices.
(g) EIA/TIA 606 - Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
(h) EIA/TIA 607 - Commercial Building Grounding and Bonding Requirements for Telecommunications.
(i) EIA - 310-D - Cabinets, Racks, Panels, and Associated Equipment.
(j) EIA/TIA 526-14 - Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant.
(k) EIA/TIA 455-57A - Optical Fiber End Preparation and Examination.
(l) EIA/TIA 455-59 - Measurement of Fiber Point Defects Using and OTDR.
(m) EIA/TIA 455-60 - Measurement of Fiber Cable Length Using an OTDR.
(n) EIA/TIA 455-61- Measurement of Fiber Cable Attenuation Using an OTDR.
(o) EIA/TIA 455-95 - Absolute Optical Power Test for Optical Fibers and Cables.
(p) EIA RS-458A Standard Optical Waveguide Fiber Material Classes and Preferred Sizes.
(q) EIA-472 Generic Specification for Optical Waveguide Fibers.
(r) EIA 232-C.
(5) Title 24 - State of California Code of Regulations.
(6) California Building Code (CBC)
(7) Occupational Safety and Health Act (OHSA) Specifications.
(8) California Electrical Code (CEC).
(9) IEEE Specifications:
     (a) IEEE 802.2.
     (b) IEEE 802.3.
(10) NEMA VE1 Cable Tray Systems.
(11) Underwriters Laboratories Specifications:
     (a) UL 497 Electrical Grounding and Bonding Equipment.
     (b) UL 1479 Fire Tests of Through-Penetration Firestops.
     (c) UL Building Materials Directory; Through-Penetration Firestops Systems, and Fill, Void or Cavity Materials.
(12) The Uniform Mechanical Code.
(13) ASTM Specifications:
   (a) ASTM E 814 Methods of Fire Tests of Through-Penetration Fire Stops.
   (b) ASTM E 136 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.


(15) Americans With Disabilities Act (ADA).

B. California State University, Office of the Chancellor - Telecommunications Infrastructure Planning (TIP) Guidelines, 1999 - The Contractor shall review the TIP and implement its requirements where subsystem design and/or installation techniques are required of the Contractor. In case of conflict between the construction documents and the TIP, the construction documents shall take precedence.

C. Where the Construction Documents make reference to a requirement that exceeds minimum code requirements or requirements of the Standards and Guidelines referred to above, the Construction Documents shall take precedence. The Contractor and Construction Administrator shall jointly resolve any work that is in apparent conflict with applicable codes.

D. In accordance with these laws, rules, and regulations, the Contractor shall provide the following:

   (1) Any additional material and labor that may be required for compliance with these laws, rules, and regulations, even though the work is not mentioned in these particular specifications.

   (2) All permits required by any of the legally-constituted public authorities for the installation or construction of the work.

   (3) Any inspection or examinations required. Copies of certificates of all such inspections shall be delivered to the Construction Administrator.

   (4) If any work is concealed without proper inspection and approval, the Contractor shall be responsible for all work required to open and restore the concealed areas, in addition to all required modifications.

1.5 GENERAL REQUIREMENTS AND CONDITIONS

A. Safety

   (1) The Contractor shall be solely and completely responsible for conditions of the job site, including safety of persons and property during performance of work.

   (2) The Contractor shall ensure that all personnel working in or anywhere on the site shall be provided a hard hat, safety shoes, a face shield or safety goggles, etc. for their protection.

   (3) If required by the campus, all personnel working in or anywhere on the site shall display a photo-ID.
The Contractor shall ensure that all personnel working in or anywhere on the site shall conform to the campus's regulations regarding confined space.

No act, service, drawing review, or construction observance by Trustees/University or any other party employed by the same is intended to include review or approval of adequacy of the Contractor's safety measures, in, on, or near the construction site.

B. Quality Assurance

(1) The specifications contained herein are set forth as the minimum acceptable requirements of the Contractor's Quality Assurance program. The Contractor is responsible for executing any other Quality Assurance measures necessary to ensure complete and fully functioning systems within the scope of this project.

(2) The Contractor shall ensure that all design, workmanship, materials employed, required equipment, and the manner and method of installation conforms to accepted practices. Where specific specifications do not apply, the more stringent of industry publications, CSU and campus policies, manufacturer's guidelines, or previous (similar) work at the project site shall apply.

(3) The Contractor shall also ensure that each piece of equipment is in satisfactory working condition.

(4) The Contractor shall certify that the cable manufacturers have carried out the quality assurance tests and procedures as specified herein. All cable must be manufactured by an ISO9001 Certified Manufacturer.

(5) The Contractor is responsible for ensuring that the cable packaging for shipping/storage purposes meets or exceeds the following requirements:
   (a) One continuous length of cable per shipping reel/container.
   (b) Reels must be wooden or steel, sturdy, lagged, and shall have thermal protection jackets applied prior to lagging.
   (c) Each reel/container shall be individually identified and marked with the length of the cable it contains. Said marking shall withstand weather and shipping conditions and remain readable.
   (d) For fiber optic cable, results of the 100% Attenuation tests conducted at the factory shall accompany each reel.
   (e) Cable shall be packed in a manner that facilitates the pre-installation tests to be conducted while the cable is still on the reel (i.e., both ends of the cable must be accessible while protected from moisture).
   (f) The Quality Assurance Plan employed shall include on-reel testing of fiber, coax, and UTP, including, but not limited to, OTDR, power loss, attenuation, etc. (as applicable for given cable media).

C. Manufacturer's Literature: Where these specifications call for an installation to be made in accordance with the manufacturer's recommendations, a copy of such recommendations shall always be kept on the job site and shall be available to campus project staff. Such documents shall have been included in the project submittals for same equipment.

D. Acceptance of Project
The project to be accepted by the Trustees/University as complete based on the following criteria:

(a) Before executing any performance testing, the Contractor shall present a comprehensive test plan consistent with all provisions of the construction documents to the Contract Administrator for University's approval.

(b) The Contractor has completed all testing and delivered copies of all test results to the Contract Administrator.

(c) All test results have been examined and approved by the Contractor and Trustees/University.

(d) Copies of all documentation required by this and other sections have been delivered to the Contract Administrator.

(e) All punch list items are completed to the satisfaction of the Contract Administrator.

(f) Structured Cabling System Certification is provided to the Trustees/University.

Following completion and/or compliance with the requirements listed above, the Contractor shall issue a Notice of Completion confirming that the project is complete. A 45-day acceptance period shall begin immediately following the issuance of the Notice of Completion.

Minor failures shall be responded to at the Trustees/University’s discretion or within one business day.

E. Guarantee and Warranties

(1) The installed structured cabling system (as applicable for given cable media) system, including both inter- and intrabuilding sub-systems, shall be a Structured Cabling System, certified for maximum period benefiting the Trustees/University (15-year minimum period). Structured Cabling Systems (SCS) wiring is defined as all required equipment and cabling including building entry protection, hardware, termination blocks, cross connect wire or cordage, patch panels, telecommunication outlets, UTP and fiber optic cable installed and configured to provide computer data, voice and video connectivity from each data, voice or video outlet to the termination equipment and hardware providing connection to network file servers or voice network/switch designated as the service point of the campus wide network. Certification of interbuilding SCS systems shall be limited to those where new inter- and intrabuilding media systems are being supplied and interconnected providing the link described above.

(2) The Contractor shall be responsible for correcting any problems and malfunctions that are warranty-related for the entire warranty period.

(3) Copies of any extended material warranties shall be passed through to the Trustees/University.

(4) During the installation and up to the date of final acceptance, the Contractor shall protect all finished and unfinished work against damage and loss. In the event of such damage or loss, the Contractor shall replace or repair such work at no cost to the Trustees/University.

F. Schedule
(1) The Contractor shall submit, prior to project start, a timeline for the project, showing all major dependencies and interactions with other trades. The schedule shall:

(a) Identify any and all disruption to existing services and/or service shutdowns on the schedule.

(b) Identify specifically the anticipated completion date for each building and each floor within each building. These completion dates shall be designated as milestones on the schedule.

(2) The Contractor shall not take any facility out of service during the University’s normal hours of operation without agreement from the campus. Any out-of-service activity shall be requested in writing and be coordinated with the Construction Administration two weeks in advance. The activity should generally be scheduled after hours.

(3) The Contractor shall make updates to the timeline and shall provide a weekly written status report to the Construction Administration.

(a) Each status report shall include details of project progress and shall describe any special incidents, activities, circumstances, or interruptions of workflow.

(b) The status reports shall specifically itemize areas that shall be affected by project activities planned for the succeeding week.

1.6 QUALIFICATIONS OF SUBCONTRACTORS

A. All subcontractors employed by the Contractor shall have a minimum of 5 years’ experience in satisfactory completion of jobs of similar scope and amount and be qualified under the CSU Contractor Pre-qualification process and criteria.

B. The Contractor shall compile detailed information relating to similar work completed by all subcontractors employed for this project, including corporate references, to enable the University to evaluate and agree to the subcontractors’ responsibility, experience, and capacity to perform the work.

C. Each subcontractor employed by the Contractor to perform telecommunications work on this project shall possess a C-7 (formerly C-61) Limited Specialty License for Telecommunications and must be certified to install, terminate, splice, and test copper cables, fiber optic cable, riser cable, and inside wiring. This requirement ensures integration into, support, maintenance, and warranty by the Contractor of the University’s new telecommunications infrastructure. The appropriate subcontractor’s license for underground construction and conduit installation is also required.

D. Each employee of the telecommunications system installer shall be certified by the SCS solution supplier and have done similar work for a minimum of five (5) years.

E. An on-site Contractor superintendent must be available at all times. Contact can be by person, telephone, or pager.

1.7 PRODUCT REQUIREMENTS

A. General Information
(1) These specifications identify the minimum specifications for product quality acceptable on this project by designating a manufacturer’s trade or brand name and catalog or model number and by describing attributes, performance, or other specifications.

(2) Where applicable, the most recent manufactured product line consistent with the structured cable system supplier identified in the technical specification sections is to be the minimum standard for quality and performance of products to be used on this project.

(3) For any product described only by attributes, performance, or directed by the specifications, the Contractor shall develop a Product Submittal in accordance with the requirements set forth herein. All Product Submittals must be reviewed by the Architect prior their use and installation on the project.

(4) Such phrases as “or equal,” “or equivalent,” and “or acceptable substitute” indicate that an equivalent product may be proposed as a substitute for that which is specified. The proposed substitution must meet or exceed the attributes, performance, or other specifications of the specified product and must be approved by Trustees/University. This expression shall not apply to the supplier of the “Structured Cable System (SCS) equipment or material which are covered under the Contractor’s extended warrantee. The University has identified a number of SCS suppliers capable of meeting the requirements of this campus’s Telecommunications Infrastructure project. All material and equipment shall be consistent with the SCS supplier’s warrantee, unless directed otherwise in these construction documents. Approval of product substitution shall be in accordance with the Contract General Conditions.

(5) Failure of the Contractor to submit proposed substitutions for approval in the manner described above shall be sufficient cause for disapproval by the Trustees/University of any substitutions otherwise proposed.

(6) Physical samples may be required. If tests to determine equality and utility are required by the Trustees/University, they shall be made by a testing laboratory with the acceptance of the test procedure first given by Trustees/University, at the expense of the Contractor.

B. Quality of Materials

(1) All materials and equipment supplied by the Contractor shall be new, manufactured within one (1) year prior to installation, and meet or exceed the latest published specifications of the manufacturer. All material shall be acceptable to and approved by the Architect as meeting these specifications.

(2) All communications materials used on this project shall conform, where applicable, to the following specifications, unless otherwise noted:
   (a) NEMA - National Electrical Manufacturers Association.
   (b) ANSI - American National Specifications Institute.
   (c) UL - Underwriters Laboratories, Inc.
   (d) The latest IEEE and EIA/TIA 568 specifications.
   (e) FCC and NCTA Coaxial Cable Television Specifications.
(3) Telephone system materials and equipment shall be FCC Type-accepted and certified as such by supplier.

(4) No material employed shall present environmental or toxicological hazards as defined by current industry specifications. All materials shall comply with CAL OSHA and EPA specifications or applicable federal or state laws or regulations.

(5) The equipment, apparatus, and material for fiber optic equipment and apparatus shall conform to existing CAL OSHA health and safety laws. The equipment and apparatus shall have provision for application of safety labels, such as LASER identification, or warning labels as required by system considerations.

C. Materials Delivery and Storage

(1) Costs of all accelerated or non-standard shipping to the site, inside handling, and all unusual storage requirements shall be borne by the Contractor unless specifically requested in writing by the University.

(2) The Contractor shall make appropriate arrangements and coordinate with authorized personnel at the site for the proper acceptance, handling, protection, and storage of materials so delivered.

D. Campus-wide Connectivity (Jack Table – Exhibit 16710-A – (Attached to this Specification)

Voice switch centers are located in Siemens Hall and Natural Resources. These locations will continue to be the voice switching center upon completion of this project. Existing voice service connections are being brought back from each building to these switching centers via the new OSP cabling system. The campus will provide the Contractor LIM (line interface module) field cable administrative data for the Contractor’s use in making the final cross-connect between the new building station cable and OSP connection to Siemens and Natural Resources. The campus data system is serviced from the data center in Van Matre Hall. Van Matre is interconnected to two other star distribution points in Siemens Hall and Natural Resources, and all three locations provide connectivity to all building on campus.

The project construction drawings reflect the locations of these switching centers and four (4) types of outlet distribution. The attached Exhibit 16710-A identifies the “information outlet” distribution planned throughout the campus. This table identifies the room number, individual outlet requirements in the room including quantity of information outlet locations and UTP cable assignments to each work area information outlet. The types of outlet locations includes (1) outlets in standard classrooms and offices, (2) outlet location in rooms classified as “high-technology classrooms”, (3) designated specific use outlet locations including “PTP” (point-to-point services, “coin” operated telephones, “house” phones and elevator phones and (4) “Unassigned” jacks and outlet locations. Contractor shall terminate all station cables at the wall-mounted 110 station cable termination field.

All designated voice connections shall be cross-connected to the appropriate building riser fields and/or to the equipped locations on respective building entry protection panels. Cables designated for “data” connectivity shall be left terminated at the wall-mounted 110 station cable termination field. Patch cable procurement and installation will be by the Campus. Video (UTP) station cable connections shall be extend to the designated telecommunication room video termination bulkhead. All fiber connections shall be terminated in the rack-mounted fiber patch panels.
(1) The first is for "standard classroom and office" areas. These are all spaces not identified in either of the other two categories. A "standard classroom or office" area is identified in the construction drawings by a reference symbol indicating that the "Jack Table" defines the media distribution in that room or area. It is a classroom environment not specifically identified as a "high-tech" room, which receives a more extensive outlet distribution. The jacks are to be located in the number of outlet locations given in the "Jack Table" or in a single box and faceplate approximately 10 feet away from the exterior wall of the particular room. The campus construction administrator will specifically identify the actual physical outlet locations in all rooms one (1) month before the Contractor has scheduled work for that building.

(2) The "high-tech" rooms receive more media distribution than standards classrooms and offices. These room layouts are specifically addressed in the construction drawings and the media distribution in those rooms is identified in room enlargements. The information outlet cable assignments are shown in Exhibit A, at the end of this specification. The data jacks identified in the specification jack table shall be distributed throughout the work area positions (symbolized by the "data jack" symbol) identified in the construction drawings. The voice jack shall be incorporated in the specific outlet location as directed by the campus during the construction period (reflecting the latest room teaching arrangement),

(3) Designated specific use outlet locations including "PTP" (point-to-point services, "coin" operated telephones, "house" phones and elevator phones are identified in the construction drawings by outlet symbols (when not specifically associated with a defined room) with the specific use identified "PTP" for point-to-point, "C" for coin operated phones, "H" for house phones, and "E" for elevator phones. Final cross-connects for these services will be accomplished based upon the campus provided cable administrative records. The Contractor shall use the existing final pathway (conduit, surface-mount, etc) from the ceiling to the outlet location servicing the end use device.

(4) "Unassigned jack and outlet locations" represent station cable jack and outlet locations not yet defined, but are to be included in the project. The assignment of the jacks and outlet locations shall be made 1 month prior to the time the Contractor anticipates working on a particular building. The outlets are not shown in the construction plans and will be physically located by campus staff in a manner similar to the campus' location of the outlet locations in "standard classrooms and offices". Contactor will is responsible for conduit extension for the cable tray to the outlet location and media placement, termination and testing similar to any other outlet location or jack identified in the project. Contractor shall cross-connect any voice jacks to outgoing riser termination blocks and/or protection panels. Data station cables will be terminated and tested from the enduser room jack to the station cable wall-mounted 110 termination field. Campus will be responsible for ultimate patch cable installation and termination for data jacks.

1.8 SUBMITTALS

A. Shop Drawings and Supplemental Data

(1) Eight (8) copies of shop drawings and supplemental data shall be provided for the Trustees/University's review. Shop drawings shall be submitted for all communications equipment, cabling, and structure pertaining to the job (for example, this includes, but is not limited to, distribution frames, conduit, wire,
fiber optic cable, terminations, splices, etc) as instructed in the various specification sections. Refer to the “Related Sections” for specific requirements for items to be submitted for review. All telecommunications product submittals shall be organized in a single bound volume(s).

(2) Design submittals (reflecting field conditions, actual cable lengths, equipment elevations, and performance expectations) shall be prepared for each system included in the project scope and submitted for review in a manner consistent with the procedures established in the construction documents.

(3) Upon completion of the project five (5) copies of final shop drawings and supplemental data, where called for, shall be submitted to the Trustees/University. Final corrected copies of schedules and shop drawings or supplemental data shall be as follows (exceptions shall be noted in Specification Sections):

(4) The shop drawings and supplemental data called for shall be submitted as the instruments of the Contractor, even though they may have been prepared by a subcontractor, supplier, dealer, manufacturer, or by any other person, firm, or organization. Prior to submission, the Contractor shall undertake its own review and stamp with its acceptance, then submit to campus project staff for their review. By accepting and submitting shop drawings and supplemental data, the Contractor represents that it has determined and verified all field measurements, the physical construction, the quality of materials, the applicability of catalog numbers, and similar data, or will do so, and that it has checked and coordinated each shop drawing with the requirements of the field conditions. Conflicts between trades shall be resolved by the Contractor in the shop drawings, if possible, but in any event prior to the actual construction.

(5) All shop drawings shall be drawn accurately on paper suitable for duplicate copying by black, blue line printing processes or Xerox.

(6) Supplemental data shall include information as noted in the specification paragraphs requiring them.

(7) The Architect will review shop drawings and supplemental data submitted by the Contractor only for general design conformance with the concept of the project and compliance with the information given in the Contract Documents.

(8) Shop drawings, if requested, shall be submitted to and favorably reviewed by Architect staff before being used by the Contractor on the job.

(9) Shop drawing delineation: The shop drawings shall be drawn to scale and shall be completely dimensioned, giving the plan together with such sections as are necessary to clearly show construction detail.

(10) Responsibility
(a) The shop drawings and all supporting data, catalogs, etc. shall be prepared by the Contractor or its suppliers. Therefore, the Contractor shall check the drawings of its suppliers as well as its own drawings before submission.

(b) In particular, the Contractor shall ascertain that the drawings meet all requirements of the drawings and specifications and also confirm to the job-site physical conditions.
(c) Each shop drawing submitted for University approval shall bear a stamp certifying that it has been checked by the Contractor in accordance with the specifications. If such shop drawings show variations from Contract Documents, whether because of standard shop practice or other reasons, the Contractor shall make special mention thereof in the transmittal letter.

(d) The Contractor shall be fully responsible for observing the need for and making any changes in the arrangement of piping, connections, wiring, manor of installation etc. that may be required by the proposed equipment, both as pertains to its own work and any work affected under other parts, headings, or divisions of Drawings and Specifications.

(11) Identification: Shop drawings shall be entitled with the name of the project on each sheet and shall otherwise be identified by listing the particular division, section, article or reference of the work to which they pertain. Different items shall be submitted on separate sheets, and all submittals shall be numbered serially.

(12) Manner: The Contractor shall furnish separate submittal sheets for each specialty item for Architect approval in the following manner:

(a) Eight (8) copies of catalog cuts shall be submitted. The cut sheets shall be photocopied or reproduced in some other acceptable manner on one side only of an 8 1/2" x 11" sheet, noting only the items in question, together with the descriptive (specification) data. Drawings shall be submitted in ozalid transparency form.

(b) Each sheet shall be identified with the division, section, article or reference in the Contract Documents that covers the item submitted for approval.

(c) Each sheet shall be identified with the project name.

(d) Each sheet shall bear the Contractor's stamp and signature of approval.

1.9 RECORD DRAWINGS

A. The Contractor shall keep one set of drawings on site to continually maintain an accurate record of the as-constructed work.

B. The marked-up drawings shall accurately indicate location of equipment, pull-boxes, conduits, cable types and labeling.

C. Within 30 days of completing work, the Contractor shall submit five (5) copies of as-built drawings to the University. In addition, the Contractor shall provide an electronic copy of the as-built drawings in a format specified by the Trustees/University.

1.10 DEFINITIONS

- **Backboard**: Backboard generally refers to the A-C, fire-retardant, plywood sheeting lining the walls of the telecommunications facilities. Backboards may also refer to the entire wall-mounted assembly, including wire management and termination frames.

- **Building Distribution Frame (BDF)**: The BDF is the location within a building where the entire inside cable and fiber optic plant originates. The entire cable and fiber optic entrance facilities also terminate here. Part of the Horizontal Distribution System may originate here as well. It may include: the physical location, enclosure, wire and copper cable management hardware, fiber and management hardware, termination hardware, distribution hardware, protection hardware, active electronic components, and equipment racks. Some industry standards may refer to the ER as the Building Distribution Frame...
Room. Throughout this specification, BDF and Telecommunications Equipment Room are equivalent.

- **Building Service Entrance (BSE):** Copper Cable that joins the University's backbone infrastructure at its connecting point to the buildings BSE.

- **Cable Plant:** Cable, conduit raceways, vaults, junction/pull boxes, rooms, racks, equipment, patch bays/blocks, and other infrastructure required to provide physical, electrical, optical connectivity between buildings on the Campus.

- **Cable Rack:** Hardware designed and manufactured for horizontal pathway distribution of cable and inside wiring inside the MDF, ER, or IDF rooms.

- **Cable Tray:** Hardware designed and manufactured for horizontal pathway distribution of cable and inside wire from the MDF, BDF, or IDF to the Information Outlet access point.

- **Designation Strips:** Paper or plastic strips, usually contained in a clear or color tinted plastic carrier, designated for insertion into a termination frame. Designation strips are usually imprinted with the adjacent terminal number and are used to aid in locating a specific pair, group of pairs, or information outlet inserted into the termination frame, or for the purpose of delineating a termination field.

- **Entrance Conduit:** Conduit that connects the University's underground infrastructure with the building's BSE or BDF.

- **Fiber Entrance Cable:** Fiber Optic cable that joins the University's backbone infrastructure at its connecting point to the buildings BSE or BDF.

- **Information Outlet:** An integral assembly containing one of the following:
  1. Category rated jacks;
  2. Fiber optic jacks (not used).
  3. Coaxial cable jack (not used).

- **Inside Plant (ISP):** Communications system inside a building (wire, fiber, coaxial cable, equipment and racks, information outlets, etc.).

- **Intermediate Distribution Room (IDF):** The IDF is the location in a building where a transition between the Riser System and the Horizontal Distribution System occurs. It may include: the physical location, enclosure, wire and cable management hardware, fiber and management hardware, active electronic components, termination hardware, and equipment racks. Some industry standards/guidelines may refer to the IDF as the Telecommunications Closet (TC) or Distribution Frame (DR). Throughout this specification DR and TC are equivalent to the IDF.

- **Main Distribution Frame (MDF):** The MDF is the location on campus where the entire outside cable and fiber optic plant originates. It may include: the physical location, enclosure, wire, fiber, and copper cable hardware, protection, active electronic components, equipment frames and racks. This space could be the Telecommunications Switching Centers and/or the Computer Center or its nodes.

- **MPOE:** Minimum Point of Entry, Utility Partnerships/Alternate Carrier, located within the existing “MDF’s”.

- **Management Hardware**
  1. **Fiber Management:** Hardware designed and manufactured for the purpose of keeping fiber patch cords neat and orderly. Most termination frame
manufacturers provide fiber management components designed to work in conjunction with their termination frames. Fiber management may also refer to other types of hardware for the purpose of securing fiber optic cable to the building.

(2) **Wire Management (Copper, Data, Network)**: Hardware designed and manufactured for the purpose of keeping cross-connect wire and patch cables neat and orderly. Most termination frame manufacturers provide wire management components designed to work in conjunction with their termination frames. Wire management may also refer to other types of hardware for the purpose of securing wire and cable to the building.

- **Outside Plant (OSP)**: Communications system outside of the buildings (typically underground conduit and vaults, exterior/underground rated wire and cable, etc.).
- **Riser Cable**: High volume cable (copper) that connects the BDF with the IDF or backboards located on the same or different floors.
- **Riser Conduit**: Conduit that connects the BDF to the IDF or backboards located on the same or different floors.
- **Riser Fiber Cable**: Fiber Optic Cables that connects the BDF with IDF or backboards located on the same or different floors.
- **Station Wire**: 4 pair, unshielded uniform twisted pair, category rated wire that connects the information outlet to the BDF or IDF.
- **Telecommunications Ground**: An electrical ground (as defined by local codes), usually the main building ground electrode extended by a continuous wire to ground bus bars in the ER, BFD, IDF, and roof telecommunications terminal point.

- **Termination Fields**
  (1) **Copper, Data, Network Termination Fields**: A group of termination fields clustered together to provide terminations for specific cable or inside wiring groups, where all of the cable or wiring in the group is used for a similar purpose, constitutes a copper, data, or network termination field. The extent of a specific field, located in a group of fields, may be distinguished by a physical separation between the frames forming the field, by uniquely colored designation strips, or by a series of terminal numbers.
  (2) **Fiber Optic Termination Fields**: A group of termination frames clustered together to provide terminations for fiber optic cable fibers, where all of the cable fibers are used for a single purpose, constitutes a fiber termination field.

- **Termination Frames**
  (1) **UTP Termination Frame**: Device designed and manufactured for the purpose of terminating large numbers of copper cable or station wire pairs. These devices generally utilize insulation displacement connections and usually require special tools to make the terminations. Throughout this specification, the terms Copper Termination Frame and Wiring Block are equivalent.
  (2) **Fiber Termination Frame**: Device designed and manufactured for the purpose of terminating fiber optic cable fibers into "LC" connector field.
  (3) **Coaxial Cable Termination Frame**: Device designed and manufactured for the purpose of terminating coaxial cable from the active data electronic hardware. These devices generally utilize insulation displacement connections and usually require special tools to make the terminations.
PART 2 - MATERIALS
Not used

PART 3 - EXECUTION
Not used

- END -