1 General

1.1 Scope of work

1.1.1 The Contractor is held responsible to be familiar with the provisions contained herein and with other Sections of this Specification as applicable to the completion of the installation.

1.1.2 Work covered by this Section shall consist of furnishing labor, equipment, supplies, materials, and testing unless otherwise specified, and in performing the following operations recognized as necessary for the installation, termination, and labeling of copper riser infrastructure as described on the Drawings and/or required by these specifications.

1.2 Intent of the drawings and specifications

1.2.1 These Specifications, together with the Drawings accompanying them, are intended to depict the installation requirements necessary to support this Project.

1.2.2 Contractor shall furnish materials shown and/or called for on the Drawings but not mentioned in the Specifications, or vice versa, that are necessary for the installation and support of the described work, whether or not specifically called for in both.

1.2.3 Contractor shall provide incidental equipment and materials required for the completion of systems included in this contract whether or not specified or shown on the Drawings.

1.3 Communication

1.3.1 It is Purdue’s expectation that the A/E of Record will work jointly with Purdue’s Telecommunication representatives to address specific technical issues and Owner requirements.

1.3.2 All questions, deviations, comments concerning guideline(s) interpretation, content, and/or use must be submitted in writing to the Project Manager for approval.

1.3.3 No deviations from these guidelines shall be incorporated into the project without written approval from the Project Manager and Purdue Telecommunications representative.

2 Products

2.1 Riser Cable (Voice) - Provide riser cables from the BDF to each IDF as indicated on Drawings or as indicated herein.

2.1.1 Riser cables shall consist of twenty-five, and/or fifty unshielded twisted pairs, 24 gauge, solid copper, S-R PVC insulated conductors, ARMM, rated category 3, CMP rated.

2.1.2 Manufacturer shall be Superior Essex, General Cable, CommScope, or Owner approved equal.

3 Execution

3.1 Telecommunication Installation

3.1.1 This Section describes the installation locations for the products and materials, as well as methods and Owner’s Standards associated with the Telecommunications Installation portions of the Project. These Specifications, along with the drawings and other Owner supplied specifications shall be followed during the course of the installation.

3.1.2 The Contractor is instructed to coordinate his efforts with the other tradesmen who may be working within the same vicinity to avoid conflict and lost time.

3.1.3 The Contractor is required to supply all necessary tools, equipment, accessories, safety equipment, protective clothing, etc., as customary for the craft and necessary for the installation.

3.1.4 The Contractor shall verify space requirements and locations with Purdue IT Infrastructure Services Representative before starting cable installations and terminations.

3.1.5 The Contractor shall verify the cable type and jacket rating required with a Purdue IT Infrastructure Services Representative before starting riser cable installation.

3.1.6 The Contractor shall verify existing cable fill in riser conduit before installation of additional cables so as not to exceed 40% cable fill. Contractor will be responsible for installation of additional riser conduit, where additional cables to be added will exceed the 40% cable fill.

3.2 Riser Conduits

3.2.1 Provide a nylon pull cord in each conduit to facilitate future installation of cables.

3.2.2 Communication pathways requiring fire stopping shall utilize removable/re-usable fire stopping putties for ease of moves, adds, and changes.

3.2.3 All fire stopping penetrations shall conform to the recommended practices listed in UL1479 or ASTM E814 and must be labeled with the UL1479 or ASTM E814 reference number, dated, and signed by the technician who installed the fire stopping material.
3.3 Copper Rising Cabling

3.3.1 The copper riser cabling will be terminated at the BDF and IDFs on 110 type wiring blocks.

3.3.2 Horizontal cabling shall be terminated such that wire pair twists are maintained as closely as possible to the point of mechanical termination. (No greater than 0.5” for category 5E.)

3.3.3 Maximum strip length shall be 1.0” or less. Maintain cable sheath to leading edge of connector block.

3.3.4 Contractor is responsible to obtain and follow installation instructions for Panduit products for correct termination and wire management of cables on respective products.

3.3.5 Owner to provide future cross-connect terminations to Campus switch.

3.3.6 ARMM cable shall be bonded to the grounding busbar within the telecommunications room at each end of the cable with a #6 AWG. Provide Preformed Line Products #8000745 Morey shield connector or Owner approved equal to make connection to the cable shielding.

3.4 Wiring Color Codes

3.4.1 Wiring Color Code - Unshielded Data Riser Cable and telephone trunk cable.

*Note:* Riser cables greater than 25 pair have same color code with different binder ribbon for each 25 pair group.

3.4.2 Wire to ANSI/TIA/EIA standards.

3.5 General Cable Installation

3.5.1 Cable bends shall not be greater than recommended by the manufacturer of the cable.

3.5.2 Care shall be taken so as not to damage cable during the installation process and that manufacturer’s pull tension specification is not exceeded.

3.5.3 Provide a minimum 8’-0” and maximum 10’-0” of slack. Loop at the TRs to be contained in the cable tray. Smaller slack loops may be required at BDF cabinets due to space constraints.

3.5.4 Within TRs, cables shall be snugly wrapped using hook and loop (Velcro® or owner-approved equivalent) reusable cable ties, a minimum of every 3’-0” for cable organization. Wire ties shall be tightened so as not to deform cable jackets and thus affect cable performance. Plastic cable tie wraps shall not be used.

3.5.5 Cable fill capacity in riser conduits shall not exceed 40% cable fill.

3.5.6 New TRs must be free from dust, dirt, and other foreign materials before the installation of any termination hardware or the termination of copper or fiber optic cables. The door to the telecommunication rooms must be installed and closed during termination.

3.5.7 Cables shall not be installed behind the 110 Blocks. Cables from the BDF shall be placed on the left side of the 110 blocks at the IDF.

3.6 Cable Testing

3.6.1 A 100% verification by Purdue personnel of all copper riser cable tests is required.

3.6.1.1 Contractor shall notify the Purdue Information Technology Telecommunications Representative at least 48 hours before the start of testing.

3.6.1.2 Contractor may request Purdue personnel to accompany them in the testing of cables to ensure proper information entry into the Fluke DTX cable analyzer.

3.6.1.3 If Purdue personnel accompany the Contractor on testing, verification shall not be performed.

3.6.2 The vertical multiple pair copper riser cables shall be tested utilizing an Independent Technologies, Inc. Test-All IV, Model ITC-302, Independent Technologies, Inc. Test-All 25, or Purdue IT Telecommunications approved equal, 4-pair or 25-pair communications and data network tester that enables the user to test 4-pair or 25-pair simultaneously.

3.6.2.1 This should have attachments to enable direct testing of 110 wiring blocks. Cable Test Results shall be submitted in Fluke Linkware (.flw) format on a CD at the end of the project. These are to consist of individual cable tests.

3.6.2.2 Purdue IT Infrastructure Services Department will expedite activation of service before substantial completion if test results are submitted electronically via email. Purdue IT Infrastructure Services Department will perform 100% verification testing as part of acceptance of copper riser tests.
3.7 Equipment Installation and Cable Termination

3.7.1 All equipment shall be installed in a neat and workmanlike manner, arranged for convenient operation, testing and future maintenance.

3.7.2 All paired cables shall be installed and terminated by technicians experienced in the termination of cables on connector blocks.

3.7.3 The Contractor shall employ certified system installation technicians and have at least 5 years of experience in the installation of similar and equivalent systems.

3.7.4 The Contractor shall supply verification of experience, for this type of work, to the Architect for approval before performing any work.

3.8 As Built Information

3.8.1 Contractor shall provide as-built information and all test result information to the Purdue IT Infrastructure Services Department.

3.8.2 As-built information shall be in red-lined format on a copy of construction drawings. Indicate location of all riser conduit routes, distribution cable trays, junction boxes, and all additions and deletions pertaining to telecommunications. Include riser labeling next to all telecom symbols.

3.8.3 If construction drawings are not utilized, Contractor shall provide all telecommunications location information on an accurate scaled floor plan.

3.8.4 Contractor shall perform all labeling requirements and provide testing documentation for verification as described herein.

3.8.5 Contractor shall submit cable records to reflect all moves, adds, and changes.

3.8.6 Contractor shall provide floor plans showing locations of all telecommunication outlets and spaces.