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 performance of multi-pair copper cable splicing as described on the Drawings and/or required by these specifications.

1.1.3 Contractor shall provide hardware for the grounding and bonding of cable and closures and all associated hardware necessary for the routing and management of communication cable in the vicinity of splices.

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.

1.4 Submittals

1.4.1 All telecommunications submittals for substitutions shall be made to Purdue’s IT Infrastructure Services Department.

1.4.2 Shop drawings shall include manufacturer's printed information with each item. The information submitted shall include overall dimensions, weights, performance characteristics and manufactured specification. Shop drawings and Manufacturer's cut sheets where required, shall be submitted by the Contractor to the Purdue IT Infrastructure Services Representative for review prior to installation.

1.4.3 Shop drawings and or manufacturers cut sheets and specification sheets shall be submitted for approval.

1.4.4 Splice closure supports, such as threaded rod and channel trapeze configurations to be fabricated on the jobsite if required.

1.5 Standards for Materials

1.5.1 All materials shall conform to the current applicable industry standards including, but not limited to:

- NEMA (National Electrical Manufacturers’ Association)
- ANSI (American National Standards Institute)
- ASTM (American Society for Testing and Materials)
- ICEA (Insulated Cable Engineers Association)
- IEEE (Institute of Electrical and Electronic Engineers)
- NEC (National Electric Code)
- NESC (National Electrical Safety Code)

1.5.2 In addition, all Material shall be Underwriters Laboratories Listed unless otherwise indicated.

1.6 Quality Assurance

1.6.1 Verification: The Owner will maintain inspection personnel on the job site. It is incumbent upon the Contractor to verify that the installation and material used has been inspected before it is enclosed within building features, or otherwise hidden from view. The Contractor shall bear costs associated with uncovering or exposing installations or features that have not been inspected.

1.6.2 Equipment Qualifications: The Contractor is to use equipment and rigs designed for pulling, placement and termination of multi-pair copper cable; including reel trucks, mechanical mules, sheaves, shoes, anchors etc., and equipment for drilling masonry, installing anchors, etc., to install support and cable management hardware.
2 Products

2.1 Splice Closures

2.1.1 The closure shall accommodate the number of cables to be spliced and allow through splices with an equal number of cables.

2.1.2 The splice closure shall be a flame retardant closure with the following basic components:

2.1.2.1 The Splice Cover shall be a two-piece reinforced fire resistant plastic or stainless steel cover with tongue and groove mating slots. The splice cover shall be closed with a snap catch clamping mechanism with reusable rubber seals, or stainless steel clamps.

2.1.2.2 Flame Retardant End Caps shall provide the means of sealing the ends of the Splice Cover and securing the cable sheaths. The end caps shall contain bonded shields within the closure to the ground bus.

2.1.2.3 The splice closure shall allow multiple re-entry.

2.1.3 Splice closures shall be Preformed Stainless Steel.

- Preformed #8000626, Armadillo 6.5"x28" splice enclosure.
- Preformed #8006176, Armadillo 9.5"x28" splice enclosure.

2.1.4 The Contractor shall use the tool kits and splice rigs recommended by the splice closure manufacturer for the splice closure provided.

2.1.5 Provide Preformed Line Products #8000745, Moray shield connector or Owner approved equal. See chart in Section 3 for number of shield connectors required based on pair count.

2.2 Copper Cable Splice Connectors

2.2.1 The splice connector shall be a modular splicing system.

2.2.2 The splice connector shall be compatible with the 24 AWG plastic insulated conductors.

2.2.3 The splice connector shall be part of a modular system that includes:

- Splice connectors
- Bridge connectors
- Half-tap connectors

2.2.4 The splice connector shall be dry for indoor application and use with 24 AWG plastic insulated conductors.

2.2.5 The splice connector shall be filled for use in outdoor applications.

2.2.6 The splice connector shall have a capacity of 25 pairs.

2.2.7 The splice connector shall be constructed to allow multiple configurations based on a 2 or 3 piece standard assembly.

2.2.8 The splice connector shall be 3M Mini Splice (MS2) 4000 Series Splicing Modules, as appropriate for the closure.

2.2.9 For outside applications, the splice connector shall be 3M Mini Splice (MS2), gel-filled #4005-GBM/TR Series Splicing Modules, as appropriate for the closure.

2.3 Multi-pair Copper Cable Identification Ties

2.3.1 The Contractor shall use owner-approved Panduit Pan-Pouch color coded cable ties for identifying multi-pair copper cable binder groups within splice closures.

2.4 Bonding Connectors

2.4.1 3M Scotchlok Bonding Connectors, 3M Part Number Series 4460-S or equivalent, shall be used to bond multi-pair copper cable jackets to appropriate ground.

2.5 Protector Panels

2.5.1 Circa Telecom 1880 series-Type Multi-pair Protector Panel, with 110 connector input, 110 connector output, (no substitutions).

- 6 Pair 110 Block Protector Panel – Circa #1880ENA1/NSC-6
- 25 Pair 110 Block Protector Panel – Circa Product #1880ENA1/NSC-25
- 50 Pair 110 Block Protector Panel – Circa Product #1880ENA1/NSC-50
- 100 Pair 110 Block Protector Panel – Circa Product #1880ENA1/NSC-100

2.5.2 Protector Modules – Circa Telecom #C3B1E Individual Protector Units

- Circa Telecom #C3B1E, Color: Black, (Standard Service), 3-element gas, (no substitutions).

2.6 Node Connectors

2.6.1 Corning #C-388-100 (388-0024, 40ft stub-down; 388-0024U, 40ft stub-up) Pair Connectors E/W 22 AWG stub shall be used on the frame at node location. Match connector blocks, stub orientation, and stub length used at individual node location. (No substitutions.)
2.6.2 Protector Modules – Lucent Individual Protector Units (no substitutions)
- Lucent #4B1-EW, Color: Black, (Standard Service)

3 Execution
3.1 Cable Splicing

3.1.1 The Contractor shall configure splice closures for straight-through splices in manholes or vaults whenever possible. Large numbers of cables may require butt splices where through splices are inappropriate, such as within confined spaces, pedestals, and handholes.

3.1.2 The closure shall be sized to ensure capacity for all pairs to be connectorized with appropriate splice modules, even if all pairs entering the closure are not to be spliced within the scope of this project.

3.1.3 All 25-pair binder groups within each cable entering the splice closure are to be connectorized with splice modules. The Contractor shall use the same type and manufacture of connectors for all pairs. Splice modules will be installed according to the manufacturer’s specifications.

3.1.4 When breaking out any multi-pair copper cable of 50 pairs or greater for splicing or termination, the binder groups shall have Panduit plastic insulated conductors color coded cable ties attached to the cable at the point of fan-out from super groups for splicing, and at the point of fan-out for termination on termination blocks.

3.1.5 The Contractor shall ensure the cables to be spliced are routed into the closure in a manner observing the bend radii restrictions of the cables being spliced.

3.1.6 Install shield bond connectors to the shields of all cables entering the closure and bond to the grounding lug of the closure prior to sealing the closure assembly.

3.1.7 The splice shall be located in an area that will allow future access and reentry. Stagger or offset the splice closures when more than one closure is installed in parallel within Utility Tunnels. Allow enough cable slack in all cables entering the closure to allow dismounting of the closure from its supports and to ensure convenient access or reentry.

3.1.8 All pairs spliced shall be tested in accordance with the Specifications, and all splice-related faults cleared prior to sealing the closure assembly.

3.1.9 Assemble the closure casing such that the hardware and fasteners are easily accessible without twisting or turning the cables.

3.1.10 Splice closures shall be sealed to provide air- and water-tight integrity, and left unpressurized at the completion of the splices. Nitrogen gas shall be injected into the assembled closures and pressure tested to 15psi. A Purdue’s Onsite Representative shall be present during testing.

3.1.11 Splice Closure Mounting

3.1.11.1 Within Manholes: Contractor shall mount assembled closures to cable hooks and manhole racking between 18 and 48 inches above the floor of the structure, measured from the bottom of the enclosure canister. Mount closures away from steps or hand holds to avoid the splice closure being used as a step for ascent or descent.

3.1.11.2 Within Utility Tunnels and Vaults: Placement in existing cable trays, attachment to racking, or attachment to stranded messenger may be required. The Contractor shall coordinate the location for the splice and alternative mounting techniques with the Purdue IT Infrastructure Services Representative prior to cutting cables in preparation for splicing.

3.1.12 A Purdue IT Infrastructure Services Representative shall be present during all splicing operations and inspect the splice before it is closed and pressurized.

3.2 Splice Closure Labeling

3.2.1 Label the assembled closure in accordance with the Owner’s instructions.

3.3 Bonding of Cable Shield

<table>
<thead>
<tr>
<th># of Pairs (24 awg)</th>
<th># of Shield Connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2100</td>
<td>1</td>
</tr>
</tbody>
</table>

3.4 Cable Termination Within Buildings

3.4.1 Buildings that contain 300 copper cable pairs or less shall have stacked copper protectors mounted vertically on the wall as shown on the drawings.

3.4.1.1 The cabling shall enter the top
or bottom of the protector splice chambers and be terminated on 110 Connector.

3.4.1.2 There shall be no exposed pairs outside of the protector panels.

3.4.2 The cable sheath of the ARMM cable shall be bonded to the protector which, in turn, is protected to the TMGB (Telecommunications Main Grounding Busbar).