1.1 **GENERAL**

1.2 **Related SFU Technical Requirements**

.1 *Division 27*

.2 *Section 27 10 00 Structured Cabling*

1.3 **Coordination Requirements**

.1 Coordinate with SFU Facilities

.2 Coordinate with SFU IT

.3 Electrical consultant

1.4 **Description**

.1 SFU general requirements for communications *Division 27*.

2.1 **MATERIAL AND DESIGN REQUIREMENTS**

2.2 **General Communications Infrastructure Summary**

.1 The Contractor shall provide Division 27 systems at SFU campus buildings as described herein and as indicated on the supplied drawings.

.2 The following communications sub-divisions are part of division 27:

- Structured Cabling
- Emergency Phones (Code Blue)
- Intercom Phones

2.3 **Scope of work**

.1 Unless otherwise noted, provide for all labour and material to constitute complete and operational Structured Cabling system as described herein and on drawings.

.2 Any apparatus, appliances, materials, or work not shown on the drawings, but mentioned in the specifications, or vice versa, or any incidental accessories necessary to make the work complete and ready for operation, even if not particularly specified, shall be furnished, delivered, and installed by the Contractor, without additional expense to the Owner.

.3 Coordinate installation with division 26 contractor and other trade contractors to facilitate installation work. Extra costs arising from conflicts or delay due to improper contractor’s coordination shall be the responsibility of the Contractor. The cost of close coordination with other trade contractors shall be the responsibility of the Contractor.

.4 Provide all equipment, personnel, & resources necessary to facilitate infrastructure testing and commissioning.

.5 Provide as-built documents, diagrams, manuals, tests results, warranties and other documentation as specified.

.6 Provide applicable infrastructure operation and maintenance training to SFU.
.7 Provide seismic restraints in accordance with local building codes and regulations and any additional requirements specified herein. Contractor shall be responsible for all costs associated with obtaining all necessary professional approvals for all seismic restraints and related shop drawings. Seismic restraints without prior approval by a professional Seismic Engineer shall be rejected by the Owner.

2.4 Reference Manufacturers & Products

.1 Reference manufacturers and/or products are described herein as a minimum reference performance requirement. Equivalent products may be considered by SFU only if it is of equal or better performance (e.g. improved delivery of signal, head-room, immunity to alien signals, power delivery, mechanical properties etc.) and brings a benefit to the Project. This review will occur during the Shop Drawing review stage.

2.5 Pre-Approved Manufacturers & Products

.1 Pre-approved manufacturers and products shall be used within the quotation. It is the discretion of SFU whether equivalent or superior products may be used. This review will occur during the Tender stage.

2.6 Product Alternates and/or Substitutes

.1 During the tender stage, the bidder shall be responsible for ensuring that proposed product alternates and/or substitutes meet and/or exceed the published performance specifications.

.2 Submit request for alternates and/or substitutes to SFU with sufficient information to facilitate suitability review. Contractor shall submit requests for alternates and/or substitutes minimum 7 days prior to tender close. Approved alternate products shall be confirmed by an Addendum minimum 3 days before tender closing.

.3 No alternates nor substitutes may be installed, without prior approval by SFU. If the Contractor substitutes any product without written permission from SFU, he/she shall be responsible for costs associated with supplying and/or installing products that will meet or exceed the published specifications, that are approved by SFU.

2.7 Contractor Qualifications

.1 Telecommunication contractor shall be Belden IBDN CSV in good standing with Belden and must be pre-approved by SFU. See Section 27 10 00 for list of pre-approved installation companies. Other contractors may apply for pre-qualification in writing minimum 2 weeks prior to tender closing date. And will be notified by an addendum.

.2 Both Contractor and subcontractor(s) shall be competent in installing the system(s) undertaken to perform work for. Competence is having the adequate skill in installing such systems AND relevant experience in installing similar systems.

.3 The Contractor must have worked for a minimum of seven (7) years on systems of this type and size. Upon request, the Contractor must submit evidence of qualifications, experience and references to SFU.
.4 Notwithstanding other requirements stipulated herein, the requirement of competence shall apply to all systems.

2.8 Contractor Responsibilities

.1 Establishment and verification of dimensions, elevations, grades, boundaries shown on drawings and, reporting of any errors or inconsistencies to SFU before starting Work. Starting Work shall imply that the Contractor has verified all items and found them to be correct. Additional costs arising out of any subsequent rectifications shall be borne by the Contractor.

.2 Coordinate Work with other trades in an efficient and harmonious manner.

.3 Take whatever measures are required to protect new and existing Communication equipment from damage due to dust contamination or construction work activity, to the satisfaction of SFU representative.

.4 Take necessary measures to maintain security and prevent unauthorized access to Communication rooms.

.5 The contractor is responsible for ensuring the infrastructure is not damaged during the installation process (i.e. improperly supported cable bundles).

.6 Contractor is responsible for the protection of the infrastructure from exposure to any elements that would void Belden certification. For example paint on cables is not acceptable.

2.9 Regulatory Requirements

.1 Contractor shall comply with the latest versions of British Columbia Building Code, and Canadian Electrical Code, including all Provincial and other amendments, local by-laws and regulations by AHJ. When multiple codes and/or regulations apply, follow the most stringent provision.

- Canadian Electrical Code
- BC Electrical Safety Act
- Work Safe BC
- British Columbia Building Code
- British Columbia Fire Code Regulation
- Municipal by-laws
- Worker’s Compensation Act
- Industry standards ANSI, TIA, BICSI

.2 Materials shall bear the approval of the Canadian Standards Association and where applicable, CUL, ULc or alternately shall bear local approval.
2.10 Damage

.1 Where existing structure, grade or pavement is required to be removed, altered or otherwise defaced to facilitate electrical installation, it will be contractor's responsibility to arrange for such work.

.2 Any equipment, structure, pavement or grade damaged by the execution of this Contract will be repaired to its original condition. Any cost incurred for such work shall be at cost to contractor.

.3 Irreparably damaged equipment; structures, walls, surfaces etc. shall be replaced at cost to Contractor.

.4 If the finish of new equipment, structures, walls, surfaces etc. is damaged by this contractor, the Contractor, at the discretion of SFU, shall either replace or restore the equipment, structures, walls, surfaces etc. to its original condition by re-spraying, refinishing, etc, at no cost to SFU.

.5 Openings and cutouts shall not be burned into panels. Oversize openings shall not be patched up with loose plates or oversize washers. Oversized openings will be considered damage to the equipment and are to be treated as specified above.

.6 The Contractor shall use extreme care when working near existing services and any services disturbed will be replaced at his cost to the satisfaction of SFU.

2.11 Shop Drawings

.1 Minimum forty (40) business days prior to ordering material and/or start of installation, The Contractor shall submit to SFU for approval:
   • Six (6) printed copies of shop drawings
   • One (1) soft copy of shop drawings (in electronic format)
   • Product samples (if requested)

.2 Shop drawings submittal shall include:
   a) Equipment/material list in tabular format with following columns:
      • Specification Reference – if applicable, indicate relevant Section and Clause paragraph numbers of the Specifications and/or Drawings.
      • Manufacturer – product brand
      • Part Number – clearly identifying the product (including any accessories, and equipment options).
      • Description – brief description of the item
      • Notes – column dedicated for Consultant’s notes during review.
   
   In addition to electronic PDF file format, provide equipment/material list to SFU in MS Word or MS Excel format.

   b) Catalogue cut-sheets shall clearly indicate (using a yellow highlighter pen or a red arrow) product part number, accessories, and options. Submit only information pertinent to the project. Advertising literature and brochures of general nature will be rejected.
c) Single-line system diagrams showing equipment interconnections including cable and signal type.

d) Drawings for custom-fabricated hardware, indicating layout, critical dimensions, materials, finish, labeling and other relevant information. (Where applicable, include description of operation).

e) A description of all changes to the electrical, mechanical, or architectural aspects of the building that the Contractor has determined are necessary to achieve the installation and functional operation of the proposed systems.

f) A description of all proposed deviations from the Specifications.

g) Additional Shop drawing requirements for Structured cabling System are included in Section 27 10 00 Clause 1.10. Refer to them for detailed instructions.

.3 If a submittal is not complete, assume the cost for re-evaluation of subsequent submittals. These costs will be charged at SFU prevailing charge-out rates.

.4 By submitting shop drawings, product data, and samples, the Contractor signifies that he or she have carefully reviewed and verified materials, quantities, field measurements, and related field construction criteria. It also signifies the Contractor has checked, coordinated, and verified that all information contained with shop drawings, product data, and samples conforms to the requirements of the Work and of the Contract Documents.

.5 Consultant’s review of shop drawings does not infer any comment on quantities shown on the drawings. Shop drawing review does not relieve the Contractor of the responsibility of receiving required approvals from inspection authorities.

.6 The Contractor shall not order or perform any portion of the Work requiring submittal and review of shop drawings, product data, or samples until SFU has approved the respective submittal.

2.12 Delivery, Storage, and Handling

.1 All materials and equipment shall be new. Deliver and store materials in original, unopened packaging. Assume all packing, transportation, and insurance costs.

.2 Ensure that all equipment and materials delivered to the site are received in writing by the Construction Manager or electrical superintendent.

.3 Store materials in a safe and secure location, and protect against damage. Coordinate storage requirements with the general contractor.

.4 Any equipment that is mounted on the floor, ceiling, and walls during the construction stage shall be protected from dust, dirt, paints, and accidental breakage due to activity by other trades. All other equipment that does not need to be mounted ahead of time shall be mounted during the finishing stage of the Work.

2.13 Coordination on Site
.1 Coordinate and cooperate with other trades for timely accomplishment of installation including supply of special materials, rough-in information, and sequencing of work. Pay particular attention to the impact of the work of others that acceptance of an alternative product may create.

.2 Coordinate and cooperate with other trades for timely accomplishment of system interfacing including supply of special materials, physical connections, testing, and adjusting.

.3 Coordinate and cooperate with other trades for space needs and other needs to result in assemblies that are well integrated into the surrounding work.

.4 The Contractor shall advise SFU of any specific equipment, materials or installation that are non-conforming with laws, by-laws or regulations of authorities having jurisdiction.

.5 Immediately upon discovering any apparent conflict between the Specifications and the drawings, or between two drawings, report the discrepancy to SFU for direction before proceeding with the affected work.

.6 When requested, Contractor shall attend coordination site meetings with the Project Manager, Consulting Engineer and/or Owner’s Representative.

2.14 Sequence and Scheduling

.1 The Contractor shall submit a complete Construction Schedule within seven (7) days of Awarding of Contract.

.2 The Construction Schedule shall indicate project milestones such as shop drawings, demolition, installation, labeling, testing, training, O&M Manual submission, As-built drawings submission, substantial completion and project closeout dates for individual systems in various work areas.

2.15 Drawings and Specifications

.1 The Contract drawings and specifications form an integral part of the contract documents. Neither the drawings nor the specifications shall be used alone. Work omitted from the drawings but mentioned or reasonably implied in the specifications, or vice versa, shall be considered as properly and sufficiently specified and shall be provided.

.2 Where conflict exists between drawings and specifications the specifications shall take precedence over the drawings.

.3 The contract includes for provision of a total number of outlets and/or devices equivalent to the quantity shown or specified. The right is reserved to change outlet / device locations as may be required by SFU or as may be necessary to place these clear of obstruction. No extra will be allowed for such changes unless, in the opinion of SFU, these changes increase the total amount of material and labour.

.4 Outlets and or devices may be relocated up to 7 meters from the position shown on contract drawings without cost to the Owner, provided the unit is not installed prior to receiving direction for such relocation.

.5 Drawings are generally diagrammatic and are intended to indicate the scope and
general arrangement of the Work. The Contractor shall not scale the drawings, but rather take field measurements.
.6 The Contractor shall obtain information from SFU where exact locations are not indicated.

.7 The Contractor shall maintain one (1) complete set of white prints to be used exclusively for purposes of recording changes, deviations and revisions from the original contract (pay particular attention to the size and location of conduits, backboxes etc.).

.8 White prints to be updated weekly by Contractor on site and must be available for SFU review bi-weekly. As-built drawings will confirm location and identification of all communication outlets, communication rooms, backbone runs and fire-stop design and records documentation.

2.16 Permits, Fees, Taxes and Inspections

.1 Prior to execution of work, the Contractor shall obtain all necessary permits and licenses for compliance with Federal, Provincial and Municipal laws and regulations.

.2 The Contractor shall be responsible for all permit, inspection and re-inspection fees.

.3 The Contractor shall pay for all associated taxes.

.4 The contractor must request and coordinate representation from SFU to inspect installation of the cabling system during, but not limited to the following stages of construction: Rough-in, telecommunication room construction, testing and completion.

***END OF SECTION***