

1 GENERAL

- 1.1 The work of this section includes the provision of all design, labour, materials, equipment and services required to fabricate and install incoming power services and site electrical distribution as required for a complete project. The work includes, but is not necessarily limited to, the items referenced herein:
- 1.1.1 Incoming, Electrical Supply
 - 1.1.2 Site Distribution
 - 1.1.3 Underground Duct Banks
 - 1.1.4 Grounding
- 1.2 Standards:
- 1.2.1 *[ANSI/IEEE 386-1995]* - Insulated Connector Systems above 600V
 - 1.2.2 *[ANSI C29-9 1883(R.1995)]* – Wet Process Porcelain Insulators
 - 1.2.3 *[CSA C22 1-98]* – Ontario Electrical Safety Code
 - 1.2.4 *[CSA C22.2 No.193-M1983(R.1992)]* - Load Interrupters
 - 1.2.5 *[CSA C22.3.2 1986]* - Grounding for Electrical Supply Stations
 - 1.2.6 *[CSA C22.3 #7-94]* - Underground Systems
 - 1.2.7 *[CSA-C2-M91(R.1996)]* - Single and Three Phase Distribution Transformers
- 1.3 Submittals:
- 1.3.1 Submit shop drawings of all Switchgear, Transformers and Equipment.
 - 1.3.2 Electrical demand load calculations.
- 1.4 Operations and Maintenance Manual:
- 1.4.1 Provide maintenance details of Operating Electrical Equipment, Transformers for inclusion in Operations and Maintenance Manual.
 - 1.4.2 Provide list of spare parts and suppliers.
- 1.5 Commissioning:
- 1.5.1 System supplied shall have a comprehensive co-ordination study.
 - 1.5.2 Equipment supplied shall be tested and commissioned by an independent testing company and a full report submitted. On test acceptance system shall be put into operation.

2 DESIGN

- 2.1 Incoming supply to be derived from the existing main distribution system and be designed to provide adequate power distribution to the new facility. Exact connection point shall be coordinated with Algonquin College representatives. The designer shall confirm that the additional load can be connected to the existing distribution network without overloading its circuit.
- 2.2 Underground duct banks to be constructed with PVC ducts buried below grade to maintain wherever possible a minimum of 1 m coverage. Ducts shall be set on chairs and concrete encased. Where duct banks pass under roadways or vehicular traffic areas, the duct bank shall be steel reinforced with main bars and saddles. Provide one spare 100 mm duct from manhole to new facility switchroom.
- 2.3 Grounding systems for all sub-stations shall meet all [CSA 22.1-98] and IEEE requirements.

3 MATERIALS

- 3.1 Switchgear equipment to match existing. Fuse size to suit the new facility's requirements, and shall be CSA approved and approved by Algonquin College.
- 3.2 Lightning Arresters to suit supply system.
- 3.3 HV Cables:
- 3.4 Multi-conductor cables to [CSA-C22-2#131] copper conductors size as required with XLPE RWU90 insulation and semi-conducting non-metallic tape over insulation and wire shield over tape. Overall PVC jacket with interlocked aluminum armour.
- 3.5 Grounding conductors to be stranded annealed copper sized to code requirements. Grounding connections to be below grade thermit weld above grade to be mechanical connection.
- 3.6 Underground ducts to be PVC conduit with associated fittings, connectors, ball ends, joints to be made with PVC cement weld.

4 INSTALLATION

- 4.1 Install main incoming power distribution equipment.
- 4.2 Install all electrical switchgear equipment to comply with manufacturers instructions and the electrical safety code.
- 4.3 Install underground services in duct banks, ensure ducts are clean and dry before pulling cables.
- 4.4 Install grounding to meet code requirements, all metal components are to be grounded.
- 4.5 All installations shall be reviewed and accepted by the Electrical Safety Authority.

End of Section