PART 1 GENERAL

1.1 REFERENCES

.1 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE).

.1 ANSI/IEEE 837, Qualifying Permanent Connections Used in Substation Grounding.

.2 Canadian Standards Association (CSA)

.1 CSA C22.2 No.0.4, Bonding and Grounding of Electrical Equipment (Protective Grounding).

1.2 SUBMITTALS

.1 Provided manufacturer's printed product literature, specifications, data sheet and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Rod electrodes: copper clad steel, 19 mm dia by 3 m long.

.2 Conductors: bare, stranded, un tinned soft annealed copper wire, size No 4/0 AWG and 2/0 AWG for ground bus, electrode interconnections, metal structures, gradient control mats, transformers, switchgear, motors, ground connections.

.3 Conductors: pvc insulated coloured green, stranded un tinned soft annealed copper wire, size No. 4 AWG for grounding cable sheaths, raceways, pipe work, screen guards, switchboards, potential transformers.

.4 Conductors: pvc insulated coloured green, stranded un tinned soft annealed copper wire No. 10 AWG for grounding meter and relay cases.

.5 Bolted removable test links.

.6 Accessories: non-corroding, necessary for complete grounding system, type, size material as indicated, including:

.1 Grounding and bonding bushings,
.2 Protective type clamps,
.3 Bolted type conductor connectors,
.4 Thermit welded type conductor connectors,
.5 Bonding jumpers, straps,
.6 Pressure wire connectors.

.7 Wire connectors and terminations: as indicated.

.8 Rubber insulating mat to run the full length of the front and rear of all switchgear. Mats to be 1000 mm wide and 6 mm thick.

PART 3 EXECUTION

3.1 GROUNDING INSTALLATION

.1 Install continuous grounding system including, electrodes, conductors, connectors and accessories in accordance with CSA C22.2 No.0.4 and requirements of local authority having jurisdiction.

.2 Ground fences to grounding system independent of station ground.

.3 Install connectors in accordance with manufacturer's instructions.

.4 Protect exposed grounding conductors from mechanical injury.

.5 Make buried connections, and connections to electrodes, structural steel work, using copper welding by thermit process.

.6 Use mechanical connectors for grounding connections to equipment provided with lugs.

.7 Use tinned copper conductors for aluminum structures.

3.2 ELECTRODE INSTALLATION

.1 Install ground rod electrodes, as indicated. Make grounding connections to station equipment.

.2 Make special provision for installing electrodes that will give acceptable resistance to ground value, where rock or sand terrain prevails.

3.3 EQUIPMENT GROUNDING

.1 Install grounding connections as indicated to typical station equipment. Non current carrying parts of: transformers, generators, motors, circuit breakers, current transformers,

frames of switches and fuse cutout bases. Cable sheaths, raceways, pipe work, screen guards, switchboards, potential transformers. Meter and relay cases. Any exposed building metal, within or forming part of station enclosure.

.2 Ground hinged doors to main frame of electrical equipment enclosure with flexible jumper.

.3 Connect metallic piping (water, oil, air, etc.) inside station to main ground bus at several locations, including each service location within station. Make connections to metallic water pipes outside station to assist in reduction of station ground resistance value.

3.4 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 – Common Work Results - Electrical and Section 01 91 13 – Commissioning (Cx) Requirements.

.2 Perform earth loop test and resistance tests using method appropriate to site conditions and to approval of Departmental Representative and local authority having jurisdiction.

.3 Perform test before energizing electrical system.

.4 Engage testing agent to inspect grounding and perform resistance test before backfill.

END OF SECTION