Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 – Common Work Results – Electrical.

1.2 REFERENCES

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

.1 ANSI/IEEE 837-02, IEEE Standard for Qualifying Permanent Connections Used in Substation Grounding.

.2 Canadian Standards Association (CSA International)

.1 CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations.

1.3 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for grounding equipment for incorporation into manual.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect grounding equipment from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 EQUIPMENT

.1 Ground Ball Stud:

1. Nominal 25.4 mm diameter ball and 114 mm overall length
2. Tin plated bronze alloy
3. 400 amps continuous current rating
4. Fault withstanding current: 43,000 amps for 15 cycles, 30,000 amps for 30 cycles

.2 Grounding conductors: bare stranded copper, tinned, soft annealed, size as indicated, minimum #2/0 AWG.

.3 Insulated grounding conductors: green, copper conductors, size as indicated, minimum #2/0 AWG.

.4 Non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:

.1 Grounding and bonding bushings.

.2 Compression connectors

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate are acceptable for grounding equipment installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION GENERAL

.1 Install complete permanent, continuous grounding system including conductors, connectors, accessories.

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

.3 Provide supports to secure ground wires properly

.4 Protect grounding conductors from any possible injury.

.5 Make connections to ground electrodes, using copper compression connectors to ANSI/IEEE 837.

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

.7 Soldered joints not permitted.

.8 Make grounding connections in radial configuration only, with connections terminating at single grounding point. Avoid loop connections.

.9 Bond metallic armoured cables and splice kits to ground.

3.3 MAINTENANCE HOLES

.1 Connect support brackets of cables, structural steel and metal parts to ground by welding copper to steel.

.2 Replace undersized ground wire with a minimum #2/0 AWG stranded copper conductor.

.3 Confirm ground resistance meets or exceeds Canadian Electrical Code minimum requirements.

3.4 Ball Studs

.1 Install ball studs permanently mounted on the bus of the switchgear “SG-1” as indicated on the drawings. Provide one ball stud on each phase bus and three studs on the ground bus to allow for de-energizing feeders to ground, when needed.

3.5 ELECTRODES

.1 Electrodes are existing in each maintenance hole.

.2 Use minimum size 2/0 AWG copper conductors for connections to electrodes.

3.6 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results - Electrical.

.2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of Departmental Representative and local authority having jurisdiction over installation.

.3 Perform ground resistance and continuity tests before energizing electrical system.

3.7 CLEANING

.1 Progress Cleaning

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

.3 Waste Management: separate waste materials for recycling.

.4 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION