

1. GENERAL

1.1 Description

- .1 Extend existing secondary grounding system to include new equipment provided in this contract. Securely and adequately ground all components of the electrical system in accordance with the requirements of all related sections in the latest Canadian Electrical Code, Local Building Code and the local Electrical Inspection Branch.
- .2 The system is to consist of cables, supports, and all necessary materials and inter-connections to provide a complete system. Measured resistance to ground of the network shall not exceed 5 ohms.
- .3 All ground conductors shall be run in conduit.

1.2 References

- .1 ANSI/IEEE 837, Qualifying Permanent Connections Used in Substation Grounding.
- .2 CSA Z32.1, Safety in Anaesthetizing Locations.

2. PRODUCTS

2.1 Equipment

- .1 Cables 3/0 and smaller to be connected to ground bars via Burndy Quiklug Type QA-2B connectors. Connections for cables larger than 3/0 shall be brazed.
- .2 All ground wires to be stranded copper TWH complete with a green jacket unless otherwise shown.
- .3 Uninsulated ground wires shall be bare stranded copper, soft annealed. Size as indicated.
- .4 In the main electrical room, provide a copper ground bar complete with lugs suitable to terminate all ground cables.
- .5 Non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:
 - .1 Grounding and bonding bushings.
 - .2 Protective type clamps.
 - .3 Bolted type conductor connectors.
 - .4 Bonding jumpers, straps.
 - .5 Pressure wire connectors.

3. EXECUTION

3.1 General

- .1 Install complete permanent, continuous grounding system including, conductors, accessories. Where EMT is used, run ground wire in conduit. All connectors shall be installed in accordance with manufacturers requirements. All frames and metallic enclosures of all electrical equipment and electrically operated equipment shall be grounded through the conduit system or via a ground wire.
- .2 All transformers, switchgear, motor control centres, panelboards and splitters fed from the main distribution centre shall be grounded by grounding conductors sized in accordance with the Canadian Electrical Code. The ground wire shall be terminated at each end with an appropriate grounding lug which shall be connected to the equipment ground bus. Ground wire to be green TWH. Use mechanical connectors for grounding connections to equipment provided with lugs.
- .3 All sub panels such as lighting panels, local distribution panels, etc., shall be grounded with a green ground wire run back to the panel from which it is fed. The ground conductor shall be sized according to the Canadian Electrical Code.
- .4 All main distribution centres, motor control centres, switchgear, and all panels requiring equipment grounds shall contain a ground bus of adequate size, and tapped for lugs for the ground wire required.
- .5 All bolted connections must be accessible.
- .6 All motors shall be grounded by means of an adequately sized green ground wire contained within the feeder conduit.
- .7 Include a separate green ground wire in all power conduits including branch circuit wiring sized to Canadian Electrical Code.
- .8 Expansion joints and telescoping sections of raceways shall be bonded using jumper cables as per Canadian Electrical Code.
- .9 Use Burndy compression connectors or approved equal for all grounding splices and terminations unless otherwise shown on the Drawings. For bolted ground connections use Burndy "Durium" or approved equal hardware.
- .10 Connect all transformer neutrals to the main building ground wire, using compression terminations.
- .11 Install rigid conduit sleeves where ground wires pass through concrete slabs.
- .12 Conduit installed buried in earth or installed in or under grade floor slabs shall have separate ground wire installed, whether the conduits are metal or not.
- .13 Ground all utility services to the electrical system ground.

- .14 Protect exposed grounding conductors from mechanical injury.
- .15 Install bonding wire for flexible conduit, connected at one end to grounding bushing, solderless lug, clamp or cup washer and screw. Neatly cleat bonding wire to exterior of flexible conduit.
- .16 Install flexible ground straps for bus duct enclosure joints, where such bonding is not inherently provided with equipment.
- .17 Soldered joints shall not be permitted.
- .18 Bond single conductor, metallic armoured cables to cabinet at supply end, and provide non-metallic entry plate at load end.

3.2 System and Circuit Grounding

- .1 Install system and circuit grounding connections to neutral of secondary 600 V system.

3.3 Equipment Grounding

- .1 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, transformers, switchgear, duct systems, frames of motors, motor control centres, starters, control panels distribution panels.

3.4 Field Quality Control

- .1 Perform tests in accordance with Section 16980 - Testing, Adjusting and Balancing of Electrical Equipment and Systems.
- .2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of Contract Administrator and local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.
- .4 Disconnect ground fault indicator during tests.

END OF SECTION