

**Part 1 General**

**1.1 WORK INCLUDED**

- .1 General inspection of all electrical equipment.
- .2 Specific equipment testing as specified herein or in other sections of the specifications.
- .3 Power Distribution System testing including insulation resistance testing, load balance, and voltage testing.
- .4 Building Systems testing.
- .5 Submittal of test reports.
- .6 Instruction for the Departmental Representative's staff in the cleaning, maintenance and operation of the building systems, equipment, and finishes.

**Part 2 Products**

- .1 Provide all instruments, meters, and equipment required to conduct tests during and at the conclusion of the project.

**Part 3 Execution**

**3.1 GENERAL EQUIPMENT INSPECTION**

- .1 Visually inspect all equipment delivered to the site, to identify damage due to transportation, handling, or placing into position. Verify the content of the equipment with the bill of material and note any missing items. Document all defects or damage noted and submit to the Electrical Representative.
- .2 Check all bus connections, wiring, and other joints that are made at equipment shipping splits and ensure that the equipment sections are properly bolted together.
- .3 Ensure that the equipment is clean and free of debris before proceeding with testing or energization of the equipment.
- .4 Verify the phasing connections of the incoming and / or outgoing connections to the equipment.
- .5 Visually check air gap and surface clearances, phase to phase and phase to ground. Document any clearances that appear to be below the CSA standard for the equipment.
- .6 Ensure that ground connections are provided to C.E.C. requirements and as specified.

### **3.2 LOW VOLTAGE SWITCHGEAR AND SWITCHBOARDS**

- .1 Randomly check 10% of bus connections for proper torque. If any connections fail the test, check another 10% until all of the samples pass.
- .2 Test and calibrate all component parts including air or power circuit breakers, instruments and control devices and instrument transformers.

### **3.3 INTERRUPTER SWITCHES AND FUSES**

- .1 Check the switch for any physical damage, inspect all insulators and barriers, and ensure that the switch is properly lubricated.
- .2 Check fuse mounts, clamps, and holders for tightness and alignment.
- .3 Operate the switch and check safety interlocks for proper operation.

### **3.4 DISTRIBUTION SYSTEM ELECTRICAL TESTING**

- .1 Take voltage readings at all power distribution points including distribution panels
- .2 Insulation Resistance Testing
  - .1 Megger test all branch circuits, feeders, and equipment buswork prior to energization. Insulation resistance shall conform to the requirements of the Canadian Electrical Code, the local inspection authority, and the Electrical Representative.
    - .1 Test circuits and equipment rated up to 350 volt with a 500 volt instrument.
    - .2 Test 350 to 600 volt circuits and equipment with a 1000 volt instrument.
  - .2 Insulation resistance less than 1.0 Megohm on any circuit, feeder, or equipment shall be considered unacceptable. Clean, dry out, or replace equipment until acceptable resistance is achieved.
  - .3 Load Balance
    - .1 Measure phase current to panelboards and distribution centres with all possible loads operating. Adjust branch circuit connections as required to obtain best balance of current between phases and record final measurements after adjustments have been completed. Load unbalance shall not exceed fifteen percent (15%).
    - .2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.
    - .3 Submit, on completion of work, a report listing phase and neutral currents on panelboards, operating under normal load. State hour and date on which each load was measured, and voltage at time of test.
- .3 Take voltage and ampere readings on all phases of each motor feeder with motors operating under full load conditions.

**3.5 BUILDING SYSTEMS TESTING**

- .1 Functionally test all building systems components including power outlet receptacles, panelboard breakers, etc.

**3.6 TEST REPORTING**

- .1 Submit general equipment inspection report to confirm that equipment has been tested and noting any damage or defects.
- .2 Submit distribution system electrical test reports including:
  - insulation resistance test results for all feeders and equipment.
  - power distribution system voltage readings
  - load balance readings.

**END OF SECTION 26 08 00**