PART 1 - GENERAL

1.1 WORK INCLUDED

.1 Electrical equipment shall conform to Canadian Electrical Code - 2012 requirements for electrical shock and arc flash hazard warning labels. Undertake electrical shock and arc flash study and analysis per CSA Z462 Workplace Electrical Safety 2012 to define Hazard Category and Flash Protection Boundary information.

.2 Install warning labels. Warning labels to be self adhesive type in highly visible locations. The labels shall be made of durable permanent adhesive and outdoor vinyl material with UV inhibited colours (UV resistant).

.3 Scope:

- .1 Accurate electrical system single-line diagram as required by CSA Z462. Include the following on the single line diagram:
  - .1 Nameplate data for electrical components (e.g. transformers, etc.).
  - .2 Cable sizes, types and lengths between electrical equipment components.
  - .3 Utility source data (obtain from Newfoundland Power).
  - .4 Verified overcurrent device settings.
- .2 Short Circuit Study in accordance with ANSI standard C37 and IEEE standard 141-1993 (Red Book).

.4 Coordination Study in accordance with IEEE 242-2001 (Buff Book) to determine the proper overcurrent device settings that will balance system reliability through selective coordination while minimizing the magnitude of an electrical arc flash hazard incident.

.5 Incident Energy Study in accordance with the IEEE 1584-2004a, "IEEE Guide for Performing Arc Flash Hazard Calculations" in order to quantify the hazard for selection of personal protective equipment (PPE). Tables that assume fault current levels and clearing time for proper PPE selection are not acceptable.

.6 Short circuit, protection coordination and arc flash hazard analyses shall be carried out utilizing professional engineering software. All electrical equipment shall be correctly identified and modelled within software. The complete electronic project files shall be provided to Departmental Representative. The files shall include: project file symbol library, component library, single lines, TCC curves, generated report files and any other related files.

1.2 SUBMITTALS

.1 Comprehensive report that includes:
- .1 Report summary with analysis methodology, findings and recommendations.
- .2 Summary of input data for utility source, equipment and cables.
- .3 Available fault current at each equipment location with comparison to equipment rating.
- .4 Overcurrent device settings (e.g. pick-up, time delay, TCC curve).
- .5 Incident energy level (calories/cm²) for each equipment location and recommended PPE.
- .6 Overcurrent device coordination curve including related section of the single-line diagram.
- .7 Report shall be stamped and signed by professional engineer registered and licensed in Province of Newfoundland and Labrador, Canada.

.2 Labels:
- .1 Installed warning labels (orange <40 cal/cm²) or danger label (red > 40 cal/cm²) in accordance with ANSI Z535.4-2002. The label must be readable in both indoor and outdoor environments for at least 3 years and contain the following information:
  - .1 Arc hazard boundary (centimeters).
  - .2 Working distance (centimeters).
  - .3 Arc flash incident energy at the working distance (calories/cm²).
  - .4 PPE category and description including the glove rating.
  - .5 Voltage rating of the equipment.
  - .6 Limited approach distance (centimeters).
  - .7 Restricted approach distance (centimeters).
  - .8 Prohibited approach distance (centimeters).
  - .9 Equipment/bus name.
  - .10 Date prepared.
  - .11 Arc flash hazard study preparer name and address.

1.3 LEED 2009 REQUIREMENTS

.1 LEED Documentation:
- .1 Submit Material Safety Data Sheets (MSDS) or product data sheets, for all site applied interior paints, coatings, adhesives, sealants, sealant primers, concrete curing compounds, etc. to ensure compliance with LEED Requirements for low emitting materials as per Section 01 35 21.

PART 2 - PRODUCTS

2.1 LEED 2009 REQUIREMENTS

.1 All site applied interior paints, coatings, adhesives, sealants, sealant primers, concrete curing compounds, etc. to comply with LEED Requirements for low emitting materials as per Section 01 35 21 - LEED 2009 Requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Clean thoroughly enclosure surface prior to applying labels.

.2 Install labels.

3.2 QUALITY ASSURANCE

.1 Provide all necessary material, equipment, labour, and technical supervision to perform the arc flash hazard analysis.

.2 Utilize engineers and technicians that are experienced and regularly perform electrical power system testing.

.3 Personnel performing the arc flash analysis shall be trained and experienced in accordance with NEMA Training Specification concerning the apparatus and systems being evaluated.

END