Environment and Climate Change Canada | Environnement et Changement climatique Canada

CONTRACT SPECIFICATIONS

ESA Electrical Deficiencies

at

867 Lakeshore Rd
Burlington, Ontario
L7S 1A1

Solicitation No: 5000044518

Technical Services
Environment and Climate Change Canada

Project No: CCIW-073 (Ecollab # 1879)

Issued for Tender
August 2019

1. SUMMARY OF WORK

1. Work to be completed under this contract involves the purchase of current transformers (CTs) as specified in the specifications document and installation of those equipment's as per drawings provided. The work will be performed at Canada Centre for Inland Waters (CCIW), situated at 867 Lakeshore Rd., Burlington, Ontario, L7S 1A1.

   The contractor must provide material, required equipment, labour for installation of current transformers, and manage the project requirements with regard to Electrical Safety Authority (ESA) Plans approval/Inspections. There are two main locations where the current transformers must be installed, on the Transformer 1 bus and Boiler room substation bus.

   As optional work, contractor must provide pricing for installation of current transformers at Transformer T2. This optional work can be amended if building operation schedule allows shutdown at time of work. Note, that only the labour for installation must be priced as optional work, current transformers and related materials must be purchased and delivered at site as per specifications documents.

   The work on this contract includes coordination and cooperation with building personnel working on the site.

2. Once work has been completed, contractor must provide Electrical Safety Authority certification of inspection.

3. General Contractor is responsible for the coordination and implementation of the Commissioning of all Sub-Contractor work, equipment and installations, if required. All completed electrical work is to be functionally and performance tested and verified by the installing Trade Contractor, and written reports indicating sign-offs provided when completed. A complete Commissioning Manual Summary report is to be prepared and submitted along with the other close-out documents at the end of the project.

2. TIME OF COMPLETION

1. Commence work in accordance with notification of acceptance of your tender submission and complete the work including rectification of deficiencies no later than **March 31, 2020.**

3. HOURS OF WORK

1. # Hours of operation

Only regular hours will be accepted - Monday to Friday – 07:00 to 16:00 hours.

Access to individuals with security clearance, who have taken the required on-site training as required for work within specified work areas, will be approved by Departmental Representative.

2. Work requiring power shutdown and/or Lock-Out (LOTO) work shall be completed following a special schedule approved by Departmental Representative.

4. Provide an implementation strategy in writing three (3) weeks prior to the first shutdown which clearly lists, the sequence of shutdowns, and the maximum length of each shutdown, to insure the owner can organize the shutdown and minimize impact in the facility operation.

5. The Contractor shall not permit his personnel to work alone on this project when the following activities are undertaken;
    1. Work assessment determines that the potential health & safety risk is high;
    2. Work requiring entry into or work within a Confined Space;
    3. Work requiring Lock-Out and Tag-Out;
    4. Work requiring use of fall arrest equipment;
    5. Work on scaffolding;
    6. Work requiring supplied air respirators or similar equipment;
    7. Hot Work and/or Hot Tap activities;
    8. Work involving cranes or hoisting;
    9. Work or work situations identified by Departmental Representative.

6. Staff training and demonstrations shall be scheduled during regular business hours Monday to Friday. The Contractor shall obtain approvals from the Departmental Representative on the training schedule prior to the scheduled training date and time.

4. SCHEDULING

1. Within two weeks of contract award, submit a bar chart construction schedule for the work, indicating anticipated progress stages within time of completion. Minimum stages include mobilization, shop drawing submittal, order and delivery of major components and equipment, major approvals stages, interim and final inspection times, commissioning timeframes, final deficiency corrections and demobilization. When schedule has been reviewed and approved by the Departmental Representative take necessary measures to complete work within scheduled times. Do not change schedule without written approvals from the Departmental Representative. Contractor must confirm the required power shutdowns and the activities for each shutdown and have these in his schedule.

5. CONTRACT DOCUMENTS

1. Drawings and specifications are complementary, items shown or mentioned in one and not in the other are deemed to be included in the contract work.

2. Any questions that arise in relation to the design shall be brought to the attention of the Departmental Representative. Failure to comply with this procedure may necessitate amendments and other layout modifications as required to complete the Work, costs of which shall be solely the responsibility of the Contractor.

3. Study all documents, which describe, or are related to any operation before commencement of that operation. Report discrepancies discovered between existing conditions and documentation. Obtain ruling on required interpretation before commencing work.

4. Any changes to the scope of work are to be confirmed in writing by the Departmental Representative and Contract value changes approved, prior to start of said work.

6. CONTRACTOR’S USE OF SITE

1. Do not unreasonably encumber site, with material or equipment.

2. Execute the work with the least possible interference or disturbance to the normal use of the exiting premises. Make arrangements with the Departmental Representative to facilitate the work as stated.

3. Maintain existing services to the building and provide for personnel and vehicle access.

4. Where security is reduced by the work, provide temporary means to maintain security.

5. Contractor shall utilize assigned washroom facilities and shall maintain them neat and tidy.

7. Contractor shall be responsible to supply their own accommodations. No storage space will be provided within the building. Accommodation will be made for limited on-site storage area at the discretion of the Departmental Representative.

7. CONTRACTOR PROJECT SUPERINTENDENT

1. The Contractor shall, upon award of contract, designate a Project Superintendent. The Contractor shall provide the name, cellular phone number to the Departmental Representative at the pre-construction meeting. The Project Superintendent shall have full responsibility for the project and shall be authorized to accept and act upon any notice or direction provided by the Departmental Representative. Project Superintendent shall be available on site at all times that work is being performed under this contract.

2. Supervise and direct all person engaged in the work, including all tradesmen and suppliers. Become familiar with the requirements of each trade. Coordinate delivery and work operations. Examine the work of all trades during work operations to ensure compliance with the contract requirements. Expedite all work to maintain the contract schedule.

3. Cooperate with all other contractors working on site in parallel or related projects.

4. Attend coordination and project meetings at the direction of the Departmental Representative.

8. CONTRACTOR and SUB CONTRACTORS

1. The Contractor agrees to employ those sub-contractors proposed by him in writing as listed in the Contractor's tender submission.

2. Do not change or substitute approved sub-contractors without prior authorization from the Departmental Representative.

3. Contractor and sub-contractor personnel shall be qualified as per definitions under the Ontario Trades Qualification and Apprenticeship Acts and as required by regulatory agencies in Ontario.

4. Electrical work shall be carried out by qualified and licensed electrical contractors as per Ontario regulations.

5. Fire alarm work shall be carried out by qualified and accredited personnel as per

Ontario regulations.

9. WORKMANSHIP

1. Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Departmental Representative, if required, if work is such as to make it impractical to produce required results.

2. Do not employ any person unfit or unskilled in their required duties. The Departmental Representative reserves the right to require the dismissal from the site, workers deemed incompetent, careless, insubordinate or otherwise objectionable.

3. The Work as covered by the tender documents is intended to comply exactly with the latest rules and regulations of the inspection authorities, and these rules are to be considered an integral part of the tender documents. In case of conflict, any ruling by the Inspection Authority shall be final. All changes and alterations to the Contractor's work required by an authorized inspector or any authority having jurisdiction shall be carried out at the expense of the Contractor.

4. Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with the Departmental Representative, whose decision is final.

10. RECORD DRAWINGS

1. As work progresses, maintain accurate records to show deviations from the contract drawings. Just prior to completion of work, supply to the Departmental Representative one set of white prints with all deviations neatly inked in. Contractor to show actual layouts for underground services including elevations, all mechanical piping and ductwork and all electrical wiring diagrams, locations and sizes of electrical conduits, pull boxes and wiring, circuits etc. The contractor will deliver the "as-built" records to the prime consultants, and will then provide 2 copies on digital CD's of the "Final Record Drawings" in PDF, and AutoCad formats for the owners records.

11. SHOP DRAWINGS

1. Provide one (1) copy of the shop drawings as listed in the specifications and/or drawings to the Departmental Representative prior to ordering materials. Shop drawings to illustrate details of portion of work specific to the project requirements. Information to clearly indicate the items to be reviewed. Generic drawings are not acceptable. Shop drawings shall be forwarded electronically to the Departmental Representative.

2. Allow two (2) working days for Departmental Representative's review of each shop drawing submission.

12. CODES AND STANDARDS

1. The following codes and Standards are in place for work under this contract. The latest edition applicable at the time to be utilized.

    1. The National Building Code of Canada
    2. The National Fire Code of Canada
    3. The Ontario Electrical Safety Code
    4. Ontario Plumbing Code
    5. Ontario Occupational Health and Safety Act and Regulations for Construction Projects
    6. Canada Labor Code Part II and Federal Occupational Health and Safety Policies

13. FEES AND CERTIFICATES

1. Submit a completed Notice of Project Form to the Ontario Ministry of Labour as required by the notification requirements under the Regulations for Construction Projects made pursuant to the Ontario Occupational Health and Safety Act. Provide copy to the Departmental Representative.

2. Submit to the Electrical Inspection Authority the necessary number of working drawings and specifications for examination and approval prior to commencement of work and pay all associated fees.
    1. Obtain and pay for all electrical inspection fees.
    2. On completion of the work provide copies of the Electrical Inspection Authority inspection approval certificates.

14. CONSTRUCTION SAFETY MEASURES

1. Observe and enforce construction safety measures required by Ontario Occupational Health and Safety Acts and Regulations for Construction Projects, Canada Labor Code Part II, Occupational Health and Safety, Workers' Compensation Board and municipal statutes and authorities and site specific Health and Safety Policies and Directives

2. In the event of conflict between any provisions of above authorities, the most stringent will apply.

3. Provide and maintain guardrails, fences, barricades, lights, signs and other devices required for protection of workmen and public in accordance with the requirements

of the Canada Labour Code Part II, Occupational Health and Safety, Ontario Occupational Health and Safety Act and Regulations for Construction Projects and Local by-laws. All signs shall be bilingual or CSA universal pictograms.

4. Ensure the safety of building personnel at all times when performing work.

5. Refer to Specifications Section 01 35 30 Health and Safety for additional requirements

15. FIRE SAFETY REQUIREMENTS

1. Comply with the National Building Code of Canada for fire safety in construction and the National Fire Code of Canada for fire prevention, fire fighting and life safety in building in use.

2. Comply with Human Resources Development Canada (HRDC), Fire Commissioner of Canada (FCC) Standards;

   1. No. 301: Standard for Construction Operations
   2. No. 302: Standard for Welding and Cutting
   3. No. 374: Fire Protection Standard for General Storage (Indoor and Outdoor) available from Fire protection Engineering Services, Labor program, HRDC or following internet site:
   http://info.load-otea.hrdc-drhc.gc.ca/~fireweb/standards/fccen.htm
   4. Retain all fire safety documents on site.

3. Refer to Section HEALTH AND SAFETY of this document for further information on Health and Safety

16. WORKPLACE SAFETY AND INSURANCE BOARD

1. Prior to commencing the work, throughout the total performance of the work when requesting payments and prior to receiving final payment, the Contractor shall provide evidence of good standing with Workplace Safety and Insurance Board of Ontario.

17. UTILITIES

1. Water supply is available on site and will be provided for construction usage at no cost. Departmental Representative reserves the right to limit volume of water utilized.

2. Existing electrical services to a maximum of 15 KVA required for the work may be used by the Contractor without charge. Ensure capacity is adequate prior to connecting and imposing additional loads. Connect and disconnect at own expense and responsibility.

18. PROTECTION

1. Protect finished work against damage until take-over.

2. Protect the work and all surrounding equipment, landscape, structures, floors, ceilings, walls, etc., from damage.

2. Make good, at no cost to the Owner, any damage caused.

3. Protect any services, which are uncovered during work.

4. Protect all areas adjacent to the construction areas from dust and debris produced during construction. Use hoarding, solid walls, drop cloths, sealed dust screens and tarps and clean up and vacuum up all debris daily.

19. PRODUCT HANDLING AND STORAGE

1. Deliver materials in original and unopened containers or wrappings with Manufacturers' seals and labels intact and legible.

2. Deliver materials in sufficient quantity to allow continuity of the work. Do not encumber site with unnecessary materials.

3. All unused materials at the end of any working day shall be properly protected from damage.

4. All materials, equipment, etc. to be handled and stored as not to interfere with the operation of the building.

5. All material and equipment to be new unless specified otherwise.

6. Contractors who use controlled products must ensure that their workers are properly trained in the safe use and handling of such products in compliance with the Workplace Hazardous Materials Information System (WHMIS).

7. Comply with all requirements with respect to Controlled products labeling and Material Safety Data Sheets (MSDSs) according to the requirements of WHMIS and the Hazardous Products Act.

20. PRODUCT AVAILABILITY

1. Upon award of contract immediately review product delivery requirements and advise the Departmental Representative of any foreseeable delays.

2. In the event of failure to notify the Departmental Representative at commencement of the work, the Departmental Representative reserves the right to require the supply

of substitute products of equivalent quality at no increase in contract price to ensure adherence to project schedule.

21. MATERIALS STANDARDS

1. Materials shall be new and work shall conform to the minimum applicable standards of the Canadian General Standards Board, the Canadian Standards Association, the National Building Code of Canada and all applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirements shall apply.

2. Products (materials, equipment and articles) incorporated in work shall be new, not damaged or defective and of best quality compatible with specifications for purpose intended. If requested by the Departmental Representative, furnish evidence as type, source, and quality of product.

3. Defective products will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is a precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

4. Should any dispute arise as to the quality of fitness of products, the decision shall rest with the Departmental Representative based upon requirements of Contract Documents. Departmental Representative's decisions shall be final.

5. Ensure that materials, equipment, services and labour are brought to site in sufficient quantity and in accordance with requirements of the work schedule.

22. MATERIALS OTHER THAN SPECIFIED

1. Secure in writing, permission from the Departmental Representative to use any materials other than those specified.

23. HAZARDOUS MATERIALS

1. Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials: and regarding labeling and the provision of Material Safety Data Sheets (MSDS) acceptable to Human Resources Development Canada, Labour Program.

24. REMOVED MATERIALS

1. Unless otherwise specified, materials for removal become the Contractor's property

and shall be taken from the site and disposed as per code requirements.

25. PROJECT CLEANLINESS

1. Remove waste materials and debris from the site at the end of each day. Leave the work area unencumbered upon completion of each work shift. Store materials and equipment.

2. Ensure site is clean, orderly and neat at all times during the work shift. Provide additional cleaning as requested by the Departmental Representative.

3. At the end of the project, remove dirt, dust and other disfigurations from all surfaces affected by the project including, but not limited to ceilings, walls, floors, fixtures and lights. Clean by dusting, damp wiping, washing, waxing and polishing to the satisfaction of the Departmental Representative.

4. Upon completion, remove scaffolding, temporary protections and surplus materials. Make good any defects noted at this stage.

5. Clean areas affected under contract, to a condition at least equal to that previously existing and to satisfaction of the Departmental Representative.

6. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

26. WASTE MANAGEMENT

1. Comply with the Environmental Protection Act, Ontario Regulations O.Reg. 102/94 and O. Reg. 103/94 for waste management programs on construction and demolition projects.

27. EXISTING SERVICES

1. Where work involves breaking into or connecting to existing services, Carry out work at times directed by the Departmental Representative. Connection to existing services shall be after hours and/or on weekends.

2. Before commencing Work, establish location and extent of service lines in area of Work and notify the Departmental Representative of findings.

3. Submit schedule to and obtain approval from the Departmental Representative for any shutdown or closure of active service or Facility. Adhere to approved schedule and provide notice to affected parties. Do not alter schedule without prior written

consent of the Departmental Representative.

4. Give the Departmental Representative 3 weeks notice related to each necessary interruption of any electrical service throughout the course of the work. Obtain written authorization from the Departmental Representative prior to any interruption. Keep duration of those interruptions to a minimum.

5. Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

6. Fire alarm shutdowns, re-activation shall be the responsibility of the Contractor. Shutdown, bypassing or isolating any initiating device or zone on the fire alarm system or the sprinkler system shall be undertaken following a submitted schedule. All shutdowns, bypassing or isolation activities on the fire alarm system or the fire sprinkler system must be authorized in writing by the Property Management District 2 prior to initiating work. Approvals for shutdowns, bypassing or isolation activities require a minimum of 3 weeks notice. Contractors shall schedule their request submittals through the Departmental Representative.

28. CUTTING, PATCHING AND MAKING GOOD

1. Cut existing surfaces as required to accommodate new work. Openings shall be neatly cut and dimensioned to fit electrical conduits, mechanical pipes and/or ductwork passing through the surfaces. Obtain the Departmental Representative's approval before cutting into structure. Cutting torches shall not be permitted.

2. Patch and make good cut on both sides of surfaces, damaged or disturbed to match or better existing conditions to the satisfaction of the Departmental Representative.
Note: The Contractor shall patch and make good existing openings when Contractor utilizes the existing openings for his work.

3. Fill voids left around all electrical conduits, mechanical pipes and/or ductwork with appropriate fire-proofing material to maintain fire stop integrity. Finish patching with finishing compounds to the satisfaction of the Departmental Representative.

29. DEMOLITION

1. Except if expressly stated otherwise, materials indicated for removal, become the Contractor's property and shall be promptly taken from the site and disposed as per code requirements.

30. EQUIPMENT

1. Provide and maintain equipment such as temporary stairs, ladders, ramps, scaffolds, swing stages, runways, chutes and the like, as required for execution of work.

2. Maintain conveying equipment such as cranes, hoists, derricks and the like, as required for execution of work.

3. Assume complete responsibility for construction strength, placing, anchoring and operation of derricks, cranes, hoists and other mechanical contrivances used for work and ensure that loads carried thereon can be safely supported and be free from accidents to all persons.

4. Have hoist capacities, with regard to anticipated loads, verified by a Professional Engineer registered in the Province of Ontario.

5. Comply with all governing safety regulations in force at the time of construction.

6. Remove immediately such equipment when not required for work.

7. Provide and maintain, on site, suitable fire extinguishers in sufficient quantities, as required by the Safety Code.

31. LOADING

1. Take precautions to prevent the overloading of any part of the structure during the progress of the work. Make good, at no expense to Owner, any damage resulting from such overloading.

32. HOISTING

1. 1. All crane operations are restricted to the following:

    a) All craning of materials and equipment must be done outside normal building operating hours, ensure interior areas below are kept unoccupied.

33. POWDER ACTUATED GUNS

1. Do not employ powder-actuated guns using explosives, unless expressly permitted by the Consultant. If permitted, comply with requirements of CAN3-Z166.2-M85 (Use and Handling of Powder Actuated Tools).

34. TAXES

1. Pay all taxes properly levied by law (including Federal, Provincial and Municipal)

2. The Harmonized Sales Tax (HST) is NOT to be considered an applicable tax for the purposes of this bid. The bidder shall therefore include separately any amount in his

bid price for the said HST. In the event the HST does apply, the successful Contractor will indicate on each application for payment as a separate amount the appropriate HST the Owner is legally obliged to pay. The Contractor's HST registration number must be shown on all invoices. This amount will be paid to the Contractor in addition to the amount certified for payment under the contract and will therefore not affect the contract price.

35. SIGNS – ADVERTISING

1. No advertising and/or posting of company signs shall be permitted.

2. Provide common-use signs as related to traffic control, information, instruction, health and safety, use of equipment, public safety devices, in both official languages or by the use of commonly understood graphic symbols to the Departmental Representative's approval.

36. SECURITY CLEARANCES

1. All personnel employed on this project shall be subject to a security check. Obtain the requisite clearance as instructed for each individual required to enter the premises.

2. **Security access:**
   - **For access, Contractors must submit the company name, individual names and date of birth along with the individual's security level clearance. Once security has reviewed and accepted these individuals they will be granted access;**
   - **Enhanced Security level is required for all contractors and individuals on this site;**
   - **Special escorted access maybe granted but is not guaranteed for those which do not presently meet this requirement;**
   - **All individuals must sign in and out at the main security desk whenever entering or exiting the site. No matter how long the duration is. The exception to this is deliveries or pickups where the individual is not out of the truck working on site.**

37. BUILDING SMOKING ENVIRONMENT

1. Smoking is prohibited in the building and on the roofs. Obey smoking restrictions on building property as directed by the Departmental Representative.

38. GUARANTEE

1. Provide written one (1) year guarantee for all materials and labour provided as part of this Contract. Effective start date shall be date of final completion.

2. The contractor, at own expense, shall correct any defects in the work due to faulty products and/or workmanship appearing within the extended guarantee/warranty periods set out in the individual sections from date of final completion.

39. TRAINING AND DEMONSTRATION

1. Upon completion of the all installations, provide qualified personnel to train and demonstrate all the installations to the site's operations and maintenance personnel. Contractor to review newly installed equipment and demonstrate the start/stop and control functions of the installed equipment. Training and demonstration to be for duration of four (4) hours or, as indicated in the equipment specification section. Training date and time to be coordinated with and approved by the Departmental Representative.

40. OPERATIONS and MAINTENANCE MANUALS

1. Provide two (2) sets of operations and maintenance manuals with data indexed in vinyl hard covered "D" ring binders. Data to include detailed technical information, documents and records describing operation and maintenance of individual components, copies of all final approved shop drawings, inspection and testing reports, warranties, and all other data specifically requested within the specifications.

2. Each binder shall have a cover sheet listing title, location and project number. Names, addresses and telephone numbers of the Contractor, Sub-Contractors and all suppliers.

3. Each binder shall list all maintenance materials, special tools, and spare parts. This will also include a signed transmittal of receipt by the owner's representatives or the engineer.

4. Provide digital media in .pdf format and of the entire Operations and Maintenance manual. Vendor literature available from the vendor in native .pdf format shall be included. If vendor literature is not available in .pdf is shall be scanned. All other information shall be scanned into .pdf. An electronic index shall be created which allows for easy navigation through the files.

41. Shipping and Receiving

1 **Contractor must be on site to receive all shipments.**

2. **Contractor is responsible to unload all shipments.**

3. **Deliveries maybe turned away if the contractor is not on site.**

4. **Contractor materials are not to be left in the shipping and receiving area.**

5. **Shipper may accept to assist the Contractor to load or unload goods and materials. Any movement of Contractor's materials will be at the request of the contractor, however the site accepts no responsibility for any damage lost or stolen goods or materials. If the contractor does not accept this condition the shipper will not assist the contractor.**

END OF SECTION

PART 1 – GENERAL

1.1 PRECEDENCE

.1 For Federal Government projects, Division 2 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
- .1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario
- .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. [1990 June 2002].

1.3 SUBMITTALS

.1 Make submittals to Consultant and Owners Representative for review.

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
- .1 Results of site specific safety hazard assessment.
- .2 Results of safety and health risk or hazard analysis for site tasks and operation.

.3 Submit 1 copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative weekly.

.4 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.

.5 Submit copies of incident and accident report.

.6 Departmental Representative will review Contractor's site-specified Health and Safety Plan and provide comments to Contractor. Revise plan as appropriate and resubmit plan to Departmental Representative within 7 days after receipt of comments from Departmental Representative.

.7 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

.9 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.5 SAFETY ASSESSMENT

.1 Perform site specified safety hazard assessment related to project.

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of project and prior to each outage.

1.7 REGULATORY REQUIREMENTS

.1 The Contractor shall comply with the specified standards and regulations to ensure safe operations. The latest editions are applicable.

.1 Canada Labour Code Part II.

.2 Canada Occupational Safety and Health Regulations.

.3 National Building Code Part 8 – Safety Measures at Construction & Demolition Sites.

.4 National Fire Code Part 4 – Flammable and Combustible Liquids.

.5 National Fire Code Part 5 – Hazardous Processes and Operations.

.6 Ontario Occupational Health and Safety Act and Regulations including;

.1 Construction Projects (O.Reg.213/91).
.2 Occupational Health and Safety Act.
.3 Workplace Hazardous Materials Information System (WHMIS).
.4 Ontario Trades Qualification and Apprenticeship Act.
.5 Ontario Electrical Safety Code (Reg.10/91).

1.8 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 RESPONSIBILITY

.1 The Contractor shall be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.10 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Health and Safety Act and Regulations for Construction Projects, R.S.O..

1.11 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the Province of Ontario and advise Departmental. Representative verbally and in writing.

1.12 POSTING OF DOCUMENTS	.1	Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of the Province of Ontario, and in consultation with Departmental Representative.
1.13 CORRECTION OF NON-COMPLIANCE	.1	The Contractor shall immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
	.2	Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
	.3	Departmental Representative may stop Work if work is deemed to be life threating and non-compliance of health and safety regulations is not corrected.
1.14 DISCIPLINARY ACTION	.1	The Contractor's disregard and/or lack of compliance to health and safety measures, procedures and policies may lead to disciplinary action by the Departmental Representative.
1.15 BLASTING	.1	Blasting or other use of explosives is not permitted without prior receipt of written instruction by Departmental Representative.
1.16 CONTRACTOR ACCIDENT AND INCIDENT REPORT	.1	The Contractor shall advise the Departmental Representative of any accident, injury, near-miss incident, fire, explosion or chemical spill occurring at the Work site and any visit to the site by a governmental enforcement official.
1.17 WORK STOPPAGE	.1	Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations of Work.

1.18 SITE HEALTH AND SAFETY POLICIES AND DIRECTIVES

.1 Where applicable the Contractor shall comply and follow all prescribed site Health and Safety Policies and Directives including but not limited to the following;

.1 Worker Profile Sheet: The Contractor shall submit to the Departmental Representative a completed Worker Profile Sheet c/w all attachments including copies of licenses, certificates and permits for supporting qualifications to perform required work for a given project for each individual worker requiring access to the site. The completed Worker Profile Sheets are required for each individual worker prior to working on site. Live work is not permitted.

.2 Emergency and Fire Evacuation Route: The Contractor shall obtain training on procedures of evacuating the site under emergency and/or fire situations. Contractor training and sign-off is required prior to initiating site work.

.3 Ontario Trades Qualifications and Apprenticeship Act: The Contractor shall sign-off confirming that the Trades Qualifications and Apprenticeship Act shall be observed and followed. Contractor sign-off is required prior to initiating site work.

.4 Lab safety training sessions for all individuals requiring access into the specific lab areas with limited access restrictions.

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1.19 WORKPLACE SAFETY AND INSURANCE BOARD

.1 Prior to commencing the work, throughout the total performance of the work when requesting payments and prior to receiving final payment, the Contractor shall provide evidence of good standing with Workplace Safety and Insurance Board of Ontario.

1.20 CONSTRUCTION SAFETY MEASURES

.1 Observe and enforce construction safety measures required by Ontario Occupational Health and Safety Acts and Regulations for Construction Projects, Canada Labour Code Part II, Occupational Health and Safety, Workers' Compensation Board and municipal

statutes and authorities and site specific Health and Safety Policies and Directives.

.2 In the event of conflict between any provisions of above authorities, the most stringent will apply.

.3 Provide and maintain guardrails, fences, barricades, lights, signs and other devices required for protection of workmen and public in accordance with the requirements of the Canada Labour Code Part II, Occupational Health and Safety, Ontario Occupational Health and Safety Act and Regulations for Construction Projects and Local by-laws. All signs shall be bilingual or CSA universal pictograms.

.4 Ensure the safety of building personnel at all times when performing work.

PART 2 – PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 – EXECUTION

3.1 NOT USED .1 Not Used.

RONDAR
A SPARKPOWER COMPANY

November 1, 2018

Technical Management Unit
Environment Canada
867 Lakeshore Road
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Subject: **Electrical Upgrade of 600 Volt Ground Fault Annunciation Specification**
Rondar Reference No. 19095

As per your request, please find the attached document outlining the technical requirements for the purchase of the 600 Volt Ground Fault Annunciation equipment. The intention is to insert this document into Environment Canada's standard tendering forms. It has been supplied in Word format for this purpose.

Should you require any further information or have any questions, please do not hesitate to contact our office.

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Specification for Supply Only of Ground Fault Detection and Annunciation Equipment

Environment Canada,

Canada Centre for Inland Waters, 867 Lakeshore Rd Burlington

Outline Brief

The requested equipment once installed is to allow detection and annunciation of Ground Faults on the primary 600 volt buses. The buses of concern are T1, T2, T2 Sync, Boiler Room T1 and Boiler Room T2. The previously installed switchgear / breakers are not capable of detection of Ground Faults on a high resistance system.

Objectives

To upgrade the grounding of the neutral of 2, three phase power systems using an artificial neutral and power resistor.
To give immediate indication when a ground fault occurs.
To provide individual feeder monitoring and protection.
To provide a method for quickly locating the phase to ground faults via pulsing current as required, allowing the user to correct the problem or allow for an orderly shutdown of the process.
To monitor neutral grounding resistor to ensure its functionality.
To provide alarm input into the building automation system.

Costing

Provide all costs and delivery schedule for the equipment as described. Costs to include all components and transportation to site.

Manufacturer Requirements

- The manufacturer of the high resistance grounding equipment shall have produced similar electrical equipment for minimum period of 5 years.
- The manufacturer of the high resistance grounding equipment shall be ISO 9001 certified.

Equipment Requirements

The following general specifications are to be met:

All equipment to be from one source from a single manufacturer.
All equipment to meet minimum requirement of design, manufactured and tested in accordance with the following standards:
IEEE (C57.32 2015)
CSA (C22.2 No. 295-15)
CSA (Standard C22.2 No 14 Industrial Control Equipment)
NEMA (Standard ICS9 Resistors and Rheostats)

The Switchgear associated with this requirement is defined by:

T1 - Eaton Pow-R-Line C 600 volts 4000 amp 3 phase 3 wire Serial 14E5038

T2 - Eaton Pow-R-Line C 600 volts 4000 amp 3 phase 3 wire Serial 14E5039

Boiler Room - Eaton Pow-R-Line C 600 volts 1600 amp 3 phase 3 wire Serial 14E5107

Equipment Requirement

- Configuration via a central display of all critical feeder protection & pulsing HRG system components.
- Pulsing power resistor to limit current flow to 5 amps during a single phase to ground fault condition.

  Pulsing characteristic to cyclically limit the fault current to 100% and 50% of the available ground fault current (5 amps) to allow tracing the faulted circuit to the point of the fault.
- Monitor each individual critical feeder breaker via zero sequence sensor for local and remote indication.

  Monitor up to 50 critical feeders per advanced HRG system.
  Assign priority level (0-15) for each monitored critical feeder for 2nd ground fault condition.
  Sensors to be rated 1000V AC.
- An individual feeder module shall be provided for each monitored critical feeder. The feeder module shall:

  Provide local ground fault indication via a red indicator on front of module.
  Provide a trip signal directly to associated critical feeder breaker shunt trip during the 2nd phase to ground fault when identified as the lowest priority faulted feeder.
  Provisions for future system expansion by adding additional feeder modules and zero sequence sensors.
- System to assist in locating fault by annunciating via an LCD display indication of:

  Alarm of 1st and 2nd phase-to-ground fault.
  Faulted phase.
  Individual feeder ID.
  Magnitude of ground fault for:
    Overall system.
    Individual feeder locations.
  Feeder "trip" ID due to 2nd phase-to-ground fault.
  Feeder assigned priority levels.
  Status of NGR.
  Loss of phase voltages.
- Advanced HRG system shall also:

  Provide Modbus RTU protocol for communication of information.
  Monitor phase to ground voltages.
  Provide ground fault alarm auxiliary relay output form C, 10A, 240V AC contact for remote indication.

Interlock system with 200m sec delay to prevent nuisance tripping due to large surges.
Provide harmonic filtering for high frequency noise and current attenuation above 90Hz.

- All system components, including Individual feeder modules and resistor to be mounted in a single NEMA 2 rated enclosure. Note: Individual zero sequence sensors are mounted at individual critical feeder locations.

- Provide a resistor monitor function, integral to the advanced HRG system to verify the integrity of the neutral grounding resistor (NGR) and alarm if:
  Resistance is more than 150% of nominal value
  Resistance is less than 66% of nominal value

- Provide ground fault system data logging capabilities, including time and date stamping of up to 99 most recent events.
- Provide Main-Tie-Main interlocking of HRG system to prevent closing tie into phase to phase to ground fault.
- Hand held pulse tracing sensor allows user to follow pulses to field locate the ground fault without de-energizing the load.

- During the 1st phase to ground fault, the customer will have the option to:
  Alarm only - allowing the user to correct the problem or allow for an orderly shutdown of the process.
  Trip with time delay adjustable from 0-99 minutes.
- During the 2nd phase to ground fault, the advanced HRG system will provide selective feeder trip by initiating a trip signal directly to the shunt trip of the critical feeder breaker identified as the faulted feeder with the lowest assigned priority.

T1 Bus

- Monitoring system and zero sequence current sensors to monitor the 9 feeders (includes 2 spares).
- Artificial neutral employing zig zag transformer to replace existing outdoor neutral resistor. Resistor to be 5 amp continuous rated.
- Resistor health monitoring function to comply with CEC-302.

T2 Bus

- Monitoring system and zero sequence current sensors to monitor the 8 feeders (Includes 5 feeders, 2 spares and 2 Sync Bus feeders).
- Artificial neutral employing zig zag transformer to replace existing outdoor neutral resistor. Resistor to be 5 amp continuous rated.
- Resistor health monitoring function to comply with CEC-302.

T2 Sync Bus

- Neutral Grounding Resistor to replace existing indoor neutral resistor. Resistor to be 2 amp continuous rated.

- Ground Fault Protection Relay and neutral ground path monitor.
- Resistor health monitoring function to comply with CEC-302.

Boiler Room T1 Bus*

Monitoring system, (no resistor required) and 3 sensors to monitor the 3 feeders (incl 1 spare).

Boiler Room T2 Bus*

Monitoring system, (no resistor required) and 3 sensors to monitor the 3 feeders.

*Note this is a main-tie-main arrangement. The main breakers are located in the T1 and T2 switchboard.

Accessories for Troubleshooting

Flexible loop 48” current sensor used with hand held multi meter (supplied by others)

Submittals

Product Data:

For each type of high resistance grounding system, accessory, and component indicated, include dimensions and manufacturers’ technical data on features, performance, electrical characteristics, ratings, and finishes.

Operation and Maintenance Data:

Include operation and maintenance manuals outlining routine maintenance requirements for all components.
Manufacturer’s written instructions for testing.
Dimensional drawing of each enclosure.
Internal component bill of materials and details.
Schematic and wiring diagrams of interconnection.

Previously purchased equipment

The following equipment has been previously purchased for the Boiler Room T1 and T2 Switchgear but has not been installed. Compatible detection systems can utilize these components. Show any possible cost reductions in relation to these parts.

I-Gard Zero Sequence Current Sensors Model R7-13A
Quantity 6
Presently Stored at CCIW