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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
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Issuing Office - Bureau de distribution

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Title - Sujet Electrical High Voltage Upgrade	
Solicitation No. - N° de l'invitation EZ899-172922/A	**Amendment No. - N° modif.** 003
Client Reference No. - N° de référence du client	**Date** 2017-04-28
GETS Reference No. - N° de référence de SEAG PW-$PWY-031-8036	
File No. - N° de dossier PWY-6-39385 (031)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2017-05-25	**Time Zone** **Fuseau horaire** Pacific Daylight Saving Time PDT
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Leung, Janie	**Buyer Id - Id de l'acheteur** pwy031
Telephone No. - N° de téléphone (604) 666-8228 ( )	**FAX No. - N° de FAX** (604) 775-6633
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:** CSC - William Head Institution – Metchosin, BC	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	**Delivery Offered - Livraison proposée**
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Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) **Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)** **Signature**	**Date**

Canada

Les documents français seront disponibles sur demande.

This Amendment 003 is raised to address questions and to issue Addendum #2.

Questions and Answers

Q1. Upon review of the documents, it appears there is no specification for the ground enhancement material noted on the drawings to encase the ground grid under the US and Transformer. Please provide a specification and manufacturer for the (500mm layer) low resistivity ground enhancement material (GEM).
A1. Resistivity coefficient not to exceed 3 ohm-cm. Refer to Addendum #2.

Q2. Considering the site is primarily rock, is it the intention to drill the ground rod holes and fill with GEM?
A2. Yes.

Q3. Once the ground system is installed as per the drawings, the system will be tested to determine compliance with code, should the system as designed fail to meet acceptable ground results, will the modifications required for compliance be covered under a change order?
A3. If the grounding system is installed in accordance with the contract documents, the Canadian Electrical Code, and the authority having jurisdiction, unforeseen site conditions will be addressed through the appropriate change management procedure.

Clarification 1: In regards to the following previously asked question, "*Only power circuit breakers are rated 30 cycle, which means that the moulded case & electronic breakers will need to be upgraded and may not fit in many of the existing spaces, can the moulded case and electronic breakers for these locations not be required to meet the 30 cycle requirement?"*.

While there are moulded case circuit breakers that are rated for 30-cycle, the requirement for 30-cycle rated breakers applies to breakers in new unit substations. For breakers in existing switchboards, refer to section 26 28 21, Moulded Case Circuit Breakers.

See attached Addendum #2.

All other terms and conditions remain unchanged.

The following changes in the tender documents are effective immediately. This addendum will form part of the contract documents.

SPECIFICATIONS

.1 Section 26 05 27 – Grounding - Primary

.1 Add reference to CSA C22.1, Canadian Electrical Code.
.2 Add resistivity coefficient for ground enhancement material.
.3 Delete paragraph 2.1.2
.4 Delete paragraph 3.1.1.
.5 Add new paragraph 3.1.1 as indicated.
.6 Delete existing paragraph 3.5, Cable Sheath Grounding.
.7 Add requirement to “engage an independent testing agent to inspect grounding and perform ground resistance test before backfill”, under Field Quality Control.
.8 Revise existing paragraph 3.6.4 as indicated in new paragraph 3.5.5.

.2 Section 26 28 21 – Moulded Case Circuit Breakers

.1 Clarify paragraph 2.4.1 for new breakers in existing switchboards as indicated.
.2 Add new paragraph 2.4.2 identifying the existing switchboard make in Outdoor Enclosure TR12

END OF ADDENDUM No. 2

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 - Common Work Results for Electrical

.2 Section 26 05 22 - Connectors and Terminations

.3 Section 26 05 28 - Grounding – Secondary

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA C22.1-15, Canadian Electrical Code, Part 1, 23rd Edition.

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

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

.2 IEEE Std-80-2000, IEEE Guide for Safety in AC Substation Grounding

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Waste Management and Disposal:

.1 Separate waste materials for recycling in accordance with Section 01 01 50 – General Instructions.

Part 2 Products

2.1 MATERIALS

.1 Rod electrodes: copper, 19 mm diameter by 3m long.

.2 Conductors: bare, stranded, tinned soft annealed copper wire, size No. 4/0 AWG and 2/0 AWG for ground bus, electrode interconnections, metal structures, gradient control mats, transformers, switchgear, motors, ground connections.

.3 Conductors: bare, stranded, tinned soft annealed copper wire, size No. 4 AWG unless otherwise indicated on drawings for grounding cable sheaths, raceways, pipe work, screen guards, switchboards, potential transformers.

.4 Conductors: pvc insulated coloured green, stranded tinned soft annealed copper wire No. 10 AWG for grounding meter and relay cases.

.5 Conductors: No. 3/0 AWG extra flexible (425 strands) copper conductor for connection of switch mechanism operating rod to gradient control mat, fence gates, vault doors.

.6 Ground enhancement material, resistivity of material not to exceed 3 ohm•cm.

.7 Bolted removable test links.

.8 Gradient control mat as indicated on drawings.

.9 Accessories: non-corroding, necessary for complete grounding system, type, size material as indicated, including:

.1 Grounding and bonding bushings.

.2 Protective type clamps.

.3 Thermit welded type conductor connectors.

.4 Bonding jumpers, straps.

.5 Pressure wire connectors.

.6 Permanent compression connectors.

.10 Wire connectors and terminations: to Section 26 05 22 - Connectors and Terminations.

Part 3 Execution

3.1 INSTALLATION

.1 The concentric neutral of medium voltage cables are to be used as the return path for fault currents throughout the site. Ground and bond the concentric neutral of cables according to CSA C22.1.

.2 Install continuous grounding system including, electrodes, conductors, connectors and accessories as indicated and to requirements of local authority having jurisdiction.

.3 Ground fences to grounding system independent of station ground.

.4 Install connectors and cadweld in accordance with manufacturer's instructions.

.5 Protect exposed grounding conductors during and after construction.

.6 Make buried connections, and connections to electrodes, structural steel work, using copper welding by thermit process.

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

.8 Use No. 4/0 AWG bare copper cable for main ground bus of substation and No. 2/0 AWG bare copper cable for taps on risers from main ground bus to equipment.

.9 Use tinned copper conductors for aluminum structures.

.10 Do not use bare copper conductors near un-jacketed lead sheath cables.

3.2 ELECTRODE INSTALLATION

.1 Install ground rod electrodes. Make grounding connections to station equipment.

.2 Install ground rod electrodes at transformer and switchgear locations.

.3 Install gradient control mats. Connect mats to station ground electrode and switch mechanism operating rods.

.4 Make special provision for installing electrodes that will give acceptable resistance to ground value, where rock or sand terrain prevails.

3.3 EQUIPMENT GROUNDING

.1 Install grounding connections as indicated to typical station equipment including: metallic water main, line sky wire, neutral, gradient control mats. Non-current carrying

parts of: transformers, generators, motors, circuit breakers, reclosers, current transformers, frames of gang-operated switches and fuse cutout bases. Cable sheaths, raceways, pipe work, screen guards, switchboards, potential transformers. Meter and relay cases. Any exposed building metal, within or forming part of station enclosure. Sub-station fences, pothead bodies. Outdoor lighting.

.2 Ground hinged doors to main frame of electrical equipment enclosure with flexible jumper.

.3 Connect metallic piping (water, oil, air, etc.) inside station to main ground bus at several locations, including each service location within station.[Make connections to metallic water pipes outside station to assist in reduction of station ground resistance value].

3.4 NEUTRAL GROUNDING

.1 Connect transformer neutral and distribution neutral together using 1000 V insulated conductor to one side of ground test link, the other side of the test link being connected directly to main station ground. Ensure distribution neutral and neutrals of potential transformers and service banks are bonded directly to transformer neutral and not to main station ground.

.2 Interconnect electrodes and neutrals at each grounding installation.

.3 Connect neutral of station service transformer to main neutral bus with tap of same size as secondary neutral.

.4 Ground transformer tank with continuous conductor from tank ground lug through connector on ground bus to primary neutral. Connect neutral bushing at transformer to primary neutral in same manner.

3.5 FIELD QUALITY CONTROL

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

.2 Engage an independent testing agent to inspect grounding and perform ground resistance test before backfill.

.3 Perform earth loop test and resistance tests using method appropriate to site conditions and to approval of the Consultant and local authority having jurisdiction.

.4 Perform test before energizing electrical system.

.5 Provide step-and-touch potential calculations using measured station ground resistance measurements. Submit test result and inspection certificate before energizing electrical system.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for moulded-case circuit breakers, circuit breakers, ground-fault circuit-interrupters, and accessory high-fault protectors.

.2 Addition of new breakers in the existing panelboard shall be of the same type as the existing installation.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International).

.1 CSA C22.2 NO. 5-13 - Moulded-case circuit breakers, moulded-case switches and circuit-breaker enclosures.

1.3 SUBMITTALS

.1 Submit product data in accordance with Section 01 01 50 – General Instructions.

.2 Include time-current characteristic curves for breakers with ampacity of 225A and over or with interrupting capacity of 20,000 A symmetrical (rms) and over at system voltage.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 01 50 – General Instructions.

1.5 QUALITY CONTROL

.1 General:

.1 Contractor to be responsible for quality control of the products and installation in this section.

.2 Quality Control Program Submittals:

.1 Quality Control Check Sheet

.3 Quality Control Check Sheet:

.1 Prepare and maintain Quality Control Check Sheets.

.2 Check sheet to be kept on site and be made available for review by the Departmental Representative at any time.

.3 Check sheets to be filled in and submitted for review, prior to substantial completion.

.4 Check sheets for each moulded case circuit breaker to include the following information:

.1 Moulded case circuit breaker specifications and installation details

.2 Itemize a check list for the following:

.1 Rating of each breaker including voltage, amp, interrupting capacity

.2 Proper connections.

.3 Label and identification

.4 Check for correct and proper calibration in accordance with coordination study.

.5 Information reflected into the as built drawings.

.3 For each tabulated item, state the following:

.1 Does the item comply with the specification? Yes/No/Not Applicable.

.4 Identify any areas of non compliance and the proposed action to make it complaint.

Part 2 Products

2.1 BREAKERS GENERAL

.1 Moulded-case circuit breakers, circuit breakers, ground-fault circuit-interrupters, and accessory high-fault protectors: to CSA-C22.2 No.5.

.2 Bolt-on moulded case circuit breaker: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.

.3 Plug-in moulded case circuit breakers: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.

.4 Common-trip breakers: with single handle for multi-pole applications.

.5 Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting.

.1 Trip settings on breakers with adjustable trips to range from 3-8 times current rating.

.6 Circuit breakers with interchangeable trips as indicated.

.7 Circuit breakers to have minimum 14,000 A symmetrical rms interrupting capacity rating.

2.2 THERMAL MAGNETIC BREAKERS

.1 Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

2.3 SOLID STATE TRIP BREAKERS

.1 Moulded case circuit breaker LSI to operate by means of solid-state trip unit with associated current monitors and self-powered shunt trip to provide inverse time current trip under overload condition, and long time, short time, and instantaneous tripping for phase short circuit protection.

2.4 NEW CIRCUIT BREAKER IN EXISTING PANELBOARD

.1 To be compatible with existing switchboard and complete with LSI electronic trip.

.2 Existing switchboard in Outdoor Enclosure TR12 is Westinghouse Switchgear Unit, S-40, LL14884, order number 06B608260.

2.5 OPTIONAL FEATURES

.1 Include:

.1 Shunt trip.
.2 Auxiliary switch.
.3 On-off locking device.
.4 Handle mechanism.

Part 3 Execution

3.1 INSTALLATION

.1 Circuit breakers installed in the existing panelboard shall be of the same type for compatibility.

.2 Install circuit breakers as indicated.

.3 Calibrate and set breakers in accordance with coordination study report.

END OF SECTION