RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Travaux publics et Services gouvernementaux Canada
Place Bonaventure, portail Sud-Est
800, rue de La Gauchetière Ouest
7 ième étage
Montréal
Québec
H5A 1L6
FAX pour soumissions: (514) 496-3822

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

Title - Sujet Main and secondary elec. subs	
Solicitation No. - N° de l'invitation EFA66-130434/A	**Amendment No. - N° modif.** 002
Client Reference No. - N° de référence du client EFA66-13-0434	**Date** 2012-07-09
GETS Reference No. - N° de référence de SEAG PW-$MTC-480-12057	
File No. - N° de dossier MTC-2-35053 (480)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à** 02:00 PM **on - le** 2012-08-07	**Time Zone** **Fuseau horaire** Heure Avancée de l'Est HAE
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Belisle (mtc480), France	**Buyer Id - Id de l'acheteur** mtc480
Telephone No. - N° de téléphone (514) 496-3881 ( )	**FAX No. - N° de FAX** (514) 496-3822
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:**	

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	**Delivery Offered - Livraison proposée**
Vendor/Firm Name and Address **Raison sociale et adresse du fournisseur/de l'entrepreneur** **Telephone No. - N° de téléphone** **Facsimile No. - N° de télécopieur**	
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**

Issuing Office - Bureau de distribution

Travaux publics et Services gouvernementaux Canada
Place Bonaventure, portail Sud-Est
800, rue de La Gauchetière Ouest
7 ième étage
Montréal
Québec
H5A 1L6

AMENDMENT 2:

THIS INVITATION TO TENDER IS, HEREBY, MODIFIED AS FOLLOW:

Delete:

List of Annexes
Annex A Statement of Work

Insert:

List of Annexes
Annex A, Statement of Work revised July 5th 2012 included.

The equipment list has been modified.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

PUBLIC WORKS AND
GOVERNMENT SERVICES CANADA

FEDERAL BUILDING

715 Peel
Montreal, Quebec
H3C 4H6

MAIN AND SECONDARY ELECTRICAL SUBSTATION INSPECTION AND MAINTENANCE

Project: R.004228.001

Date: July 5th 2012

Public Works and
Government Services Canada

INDEX TO TENDER DOCUMENTS AND SPECIFICATIONS

Project #R.004228.001

FEDERAL BUILDING

715 Peel
Montreal, Quebec
H3C 2H4

MAIN AND SECONDARY ELECTRICAL SUBSTATION
INSPECTION AND MAINTENANCE

May 2012

INDEX TO SPECIFICATIONS
MAIN AND SECONDARY ELECTRICAL SUBSTATION
INSPECTION AND MAINTENANCE

SECTION 1 GE – GENERAL PROVISIONS

1 DRAWINGS

1. No drawings are attached to these specifications.

2 CONDITIONS

1. All clauses and general conditions apply to and govern performance of this work.

2. Section 2 GE of these specifications shall be performed at the lump sum rate set out in part A of the price table to be completed.

3. Any repairs required and authorized by the Department shall be done at the hourly rate set out in part B of the price table to be completed.

4. The Contractor shall provide emergency service at all times to cover any possible power outages. The Contractor shall ensure that the necessary staffs are on site within three hours. Only the Technical Authority for the building or the Technical Authority's representative can authorize service calls and work orders.

5. The Contractor shall provide all necessary parts for the maintenance or repair work for which the Contractor is responsible.

3 HOURLY-RATE WORK (REPAIRS AND SERVICE CALLS)

1. All hourly-rate repairs and service calls shall be authorized in advance by the Technical Authority.

2. The applicable hourly rates shall be the rates set out in part B when the work is done at straight time and must include benefits, travel, parking, administrative costs and profit.

3. For emergency calls only, a total of one hour shall be allowed for travel to and from the work site (half an hour each way).

4. DEFECTS AND ABNORMAL CONDITIONS

1. Defects or abnormal conditions in systems, devices or equipment discovered during an inspection shall be promptly reported to the Department, which will then be responsible for taking corrective action. If the services of a licensed electrician are needed to install wiring or conduits, for example, the Department may choose to hire the Contractor holding this contract or any other contractor to carry out the work. In either case, the Contractor shall advise the Department or the Departmental Representative in order to help correct the defect or anomaly.
2. The Contractor is responsible for maintenance, repair and adjustment of equipment or systems carried out by a sub-contractor. However, the Contractor is not responsible for work done by another contractor selected by the Department unless the Contractor subsequently inspects the equipment or systems repaired or adjusted by the other contractor.
3. When the Contractor does repairs, the Contractor shall leave on site for inspection any defective parts that were replaced and shall make a notation to that effect in the report.

5. PARTS AND TOOLS

1. The Contractor shall repair worn parts or, where necessary, replace them with new parts.
2. The Contractor shall supply all instruments, tools, parts and materials required for the maintenance, repair and replacement of the parts covered by the contract.
3. Replacement parts shall be authentic and shall be obtained from the equipment manufacturer. Where it is impossible to obtain authentic replacement parts or materials, the Contractor shall use parts or materials

equal in quality to or better than the original parts or equipment; substitutes shall be approved by the Department or its representative.

4. The Department reserves the right to decide on the quality of replacement parts; this decision shall be final and cannot be appealed.

5. Any parts installed without the Department's approval or deemed by the Department not to be in compliance shall be replaced within eight days, failing which the Contractor shall be deemed to be in default.

6. Any change of parts shall be authorized in advance by the Departmental Representative.

6. LABOUR

1. Labour shall be supplied by the Contractor and shall be fully qualified.

2. The Department reserves the right to reject and request the replacement of any individual it deems to be unacceptable.

3. The Contractor shall supervise its employees to ensure that their conduct and attire are appropriate and that their movement within the buildings is limited to the specific requirements of the work to be performed.

4. The Department shall make available to the Contractor a person to provide guidance as needed during the work period.

7. WORK PERIOD

1. The work period and schedule shall be established and co-ordinated with the timetable previously agreed to by the Contractor and the Technical Authority of the building and/or the authority's authorized representative. Work shall be performed mainly on weekends.

8. POWERING OFF

1. None of the owner's equipment shall be powered off unless the Contractor is given official notice by the Building Manager and/or the Building Manager's authorized representative. If maintenance or repair work

requires that Hydro Québec equipment be powered off, the task shall be coordinated with the latter and the Contractor by the Building Manager and/or the Building Manager's authorized representative. The owner shall be responsible for the costs of Hydro Québec's materials and labour associated with the powering off and on of equipment.

9. SITE SECURITY

1. The Contractor and representatives of the Contractor's firm shall comply with the building security rules.

2. The Contractor shall provide the instructions, notices and signage necessary to inform the Building Manager and building occupants about any work in progress.

3. Equipment shall be delivered to the location stipulated by the Building Manager. The Contractor's representatives shall clear that space upon receiving the equipment unless otherwise authorized by the Manager.

4. The Contractor or the Contractor's representatives shall sign the in/out log in the location designated by the Building Manager, indicating the time in, the time out and the reason for their visit.

10. DEPARTMENTAL REQUIREMENTS

1. The Contractor shall have sufficient electricians with least five years of experience in his or her respective trade.

2. Only qualified personnel with the appropriate credentials shall be allowed to work on electrical, electronic and pneumatic systems as the case may be.

3. The Contractor shall be fully responsible for any omissions, breakage or incompetence and the consequences of the actions of its personnel.

11. PERSONAL PROTECTION AND PROTECTION OF PROPERTY

1. The Contractor shall take such safety measures and precautions as are needed to protect individuals and property against accidents or damage while maintenance and repairs are being carried out.
2. The Contractor shall be specifically and fully liable for any accidents or damage sustained by persons or property because of its activities on the premises.
3. Special care shall be taken to avoid soiling, scratching, damaging or hitting finished surfaces with ladders, scaffolding or any other equipment that may be used in the course of the work.

12. FIRE PROTECTION

1. The Contractor shall at all times comply with the "Fire Protective Features of Design" published by the Fire Commissioner of Canada, Human Resources Development, Labour Directorate, Fire Safety Division.

1. The standard is available from the Labour Directorate, Fire Safety Engineering, Guy Favreau Complex, 200 René Lévesque West, 4th floor, West Tower, Montreal, Quebec H2Z 1X4. Telephone 514-982-2553.

2. Copies of the standard can be obtained by contacting Human Resources Development, Labour Directorate, Fire Safety Division, Ottawa K1A 0J2.

13. CLEAN PREMISES

1. The Contractor shall not allow debris to accumulate. After each work period, the Contractor shall remove from the premises any waste generated by its work. The Contractor shall clean the premises to the satisfaction of the Departmental Representative.

14. INSTRUCTIONS

The Contractor shall comply with any instructions or directives it receives from the Technical Authority of the federal building at 715 Peel, Montreal, Quebec.

15. COMMUNICATIONS

1. The addresses and telephone numbers where the Contractor or the Contractor's superintendent or manager can be reached at any time of day or night shall be recorded on a list prepared and updated as necessary by the Contractor and given to the Building Manager before the start of work.

16. REPORTS, CERTIFICATES AND WORKSHEET

1. After each repair or service call, the Contractor shall provide three copies of a worksheet accompanied by itemized certificates for the replacement parts. The worksheet shall identify the date and the work performed, the parts replaced and/or repaired, and the number of hours worked by each individual assigned to the job. The Contractor shall submit separate worksheets for maintenance jobs and repair jobs. Worksheets for emergency calls shall indicate, in addition to the above-mentioned details, the date and exact time of the call, the name of the individual who placed the service call, the time the Contractor arrived at the premises and the time the Contractor left.
2. The Technical Authority of the building or the Technical Authority's authorized representative shall keep one copy signed by the Contractor and immediately forward one copy to the client department. The third copy shall remain the property of the Contractor.
3. When there is no authorized representative on site, the Contractor shall send the Building Manager two copies

of the worksheet duly signed by the security guard on duty.

4. At least 10 working days following the work, the Contractor shall provide the Technical Authority with a complete print character report of the inspections, including the list of equipment confirming that it is operating properly.

5. The form and the information to be recorded in each report must be submitted before the contract, to approval by the Technical Authority, which reserves the right to have them changed, if necessary.

6. Each report shall be checked and countersigned by the Technical Authority of the building or another individual who has been designated by the Technical Authority.

7. Reports can be sent by mail, mail, email or fax.

8. PWGSC must have received the report or reports and certificates required to make payment of the invoice.

17. MANUFACTURERS' INSTRUCTIONS

The Contractor shall comply fully with manufacturers' and suppliers' instructions and directives when servicing systems, devices and equipment.

18. ISOLATION AND ELECTRICAL TRANSFER REQUEST

1. The Contractor shall complete form DPW-MTP2465, Isolation and Electrical Transfer Request, in all instances of electrical power interruption or isolation described below in accordance with Part II, Division VIII of the *Canada Labour Code*.

    1. Main power supply to building.
    2. Power supply panels and sub-panels.
    3. Busbars.
    4. Motor control centres.
    5. Emergency power supply.

6. Fire alarm system and fire protection equipment.
7. Mechanical protection devices (sump pump, etc.).
8. Alarm circuit for building services, including heating, ventilation and air conditioning equipment.
9. Circuits serving more than one device.
10. Circuits connected to a single device integrated into a cooling or heating system.

1. The Contractor shall complete the form and have it countersigned by the Technical Authority before carrying out the work.

19 ADDITIONS/MODIFICATIONS

1. The Department reserves the right to move, modify or add devices and related equipment. The Contractor shall be required to ensure maintenance thereof at no additional cost, provided the amount of equipment added does not exceed 3% of the existing amount.

20 GENERAL SAFETY

1. GENERAL CLAUSES

NOTE

The general and or/specific clauses below may apply to the contract in their entirety or in part. Before undertaking any work whatsoever, the Contractor must confirm with the Departmental Representative whether it is required to comply with the conditions below and must do so if that is the case.

1.1 In accepting this contract, the Contractor agrees to assume all of the responsibilities normally assigned to the principal contractor and the Employer under the *Act Respecting Occupational Health and Safety* and to supervise the work.

1.2 The Contractor shall manage its activities so as to ensure that the health and safety of its employees and the occupants of the building or facility and the public and protection of the environment always take precedence over cost and scheduling

concerns. Further, the Contractor shall meet all of the requirements of these specifications.

1.3 The Contractor shall comply at all times with the provisions of the *Act Respecting Occupational Health and Safety*, the Safety Code for the Construction Industry and the *Regulation Respecting Occupational Health and Safety* where they apply.

1.4 The Contractor shall perform all work in accordance with the latest editions of the *National Fire Code of Canada*, the *National Building Code* and the *Canadian Electrical Code* and any other applicable codes or standards.

1.5 The Contractor shall submit to the technical officer a prevention program specific to any activities the Contractor is likely to carry out in the building at least 10 days prior to the start of work. The Contractor shall thereafter update the prevention program if the work proceeds differently than initially planned. The building technical officer may, after receiving the program and at any time during the work, demand that the program be amended or complemented to better reflect actual worksite conditions. The Contractor shall then make the necessary changes prior to the start of work.

The prevention program shall be based on identification of risks and shall take into account the information and requirements set out in these specifications. The program shall be applied for the entire term of the contract and shall meet the following requirements:

- include the company's policy on health and safety;
- include an organization chart of health and safety responsibilities;
- identify risks specific to each category of tasks that will be performed in order to execute the contract and the corresponding preventive measures based on the regulatory requirements;
- identify the person responsible for implementing preventive measures;
- take into account risks that may affect the health and safety of workers, occupants of the building or facility and the public;
- include first aid and primary care standards;
- include an accident response procedure;
- include a workplace inspection sheet based on the identification of risks;
- include repair jobs that may be assigned to the Contractor under this contract;
- include a written undertaking from all stakeholders to comply with the prevention program.

1.6 In addition to the program specified in the previous paragraph, for all cases in which the work to be completed involves a construction site as defined in the Act Respecting Occupational Health and Safety, R.S.Q., c. S-2.1, the Contractor shall develop a prevention program specific to the work to be completed and submit it to the building technical officer, and must also submit it to the Commission de la santé et

de la sécurité du travail (CSST) and the Association paritaire pour la santé et la sécurité du travail, in compliance with section 198 of this Act. The requirements related to that program are the same as the requirements listed in 1.5.

1.7 For all cases in which the work constitutes a construction site as defined in the Act Respecting Occupational Health and Safety, R.S.Q., c. S-2.1, a notice of opening of a construction site must be submitted to the CSST before the start of work and a copy must be submitted to the building technical officer. A copy of this notice must be posted in plain view on the site. When the site is disassembled, the notice of closing of a construction site must be submitted to the CSST with a copy to the building technical officer.

1.8 The Contractor shall submit the following documents to the building technical officer:

- a copy of the training certificates required for application of these specifications and safe planning of the work, for example, general health and safety for construction sites, asbestos, lock-out, first aid);
- a copy of the safety data sheet for every controlled product used on the worksite, at least three days before the product is used on site;
- confirmation of medical exams for supervisory staff and all employees where medical exams are required by a statute, a regulation, a directive, a specification or a prevention program. The Contractor shall thereafter promptly submit confirmations of medical exams for all persons new to the worksite;
- a copy, signed and sealed by an engineer, of all plans and compliance certificates required under the Safety Code for the Construction Industry (S-2.1, r. 6), any other statute or regulation, or any other clause of the specifications or the contract. A copy of these documents shall also be sent to the CSST and be available on the worksite at all times;
- a mechanical inspection certificate for the machinery used to perform the work (e.g., elevating platforms);
- an investigation report within 24 hours following any accident that results in an injury or any incident that brings to light a potential hazard;
- a copy, within 24 hours, of any inspection report, notice of correction or recommendation issued by federal or provincial inspectors.

1.9 The Contractor shall ensure that the equipment, tools and protective equipment used to carry out the work are maintained and kept in good condition. Equipment, tools or

protective equipment that cannot be installed or used without compromising the health and safety of workers or the public are deemed to be inadequate for the work to be performed. The Technical Authority reserves the right to prohibit the use of any materials or equipment deemed hazardous, defective or inappropriate.

1.10 The Contractor shall ensure that its employees have received the training and information needed to perform their tasks safely and that all necessary tools and protective equipment are available, comply with the applicable standards, statutes and regulations, and are used.

1.11 The Contractor shall take such measures as are needed to enforce and ensure compliance with the health and safety requirements set out in the contract documents, federal and provincial regulations, applicable standards and the prevention program specific to the work, and to comply promptly with any order or notice of correction issued by the CSST.

Regardless of the number of workers assigned to the work, the Contractor shall designate a person to act as workplace health and safety officer and give that person the authority to order work stopped or resumed when the person deems such action necessary for health and safety reasons.

1.12 Without limiting the scope of the preceding clause, the building technical officer may at any time order that work be stopped if he or she believes there is a hazard or risk to the health and safety of employees assigned to the work, the public or the environment.

The Contractor shall take such measures as are needed to ensure effective communication of health and safety information. As soon as they arrive on the worksite, all workers shall be informed of the details of the prevention program and their obligations and rights. The Contractor shall maintain a log of information provided and obtain the signature of every worker who is given the information.

The Contractor shall inform its workers that they have the right to refuse any work that entails a risk to their health or safety.

1.13 The Contractor shall inspect the worksites and submit to the building technical officer a duly completed worksite inspection sheet every working day or at an interval determined with the building technical officer on the call-up against a standing offer form.

1.14 The Contractor shall promptly take such measures as are needed to correct instances of non-compliance with statutes and regulations and hazardous situations identified by a government inspector, the building technical officer or the PWGSC health and safety coordinator or in the course of a periodic inspection. Submit to the building

technical officer written confirmation of any measures taken to correct violations and hazardous situations.

1.15 The Contractor agrees to comply with first aid and emergency response standards in accordance with the applicable policies and regulations and any other clause of the specifications.

1.16 The Contractor shall review the building and facility evacuation procedure and provide its employees with the training and information they need to apply the procedure.

1.17 For all cases in which the work constitutes a construction site as defined in the *Act Respecting Occupational Health and Safety*, R.S.Q., c. S-2.1, a decision-making representative of the Contractor must attend all meetings where health and safety on the site is considered. The Contractor must set up a worksite committee and hold meetings in compliance with the requirements of the Safety Code for the Construction Industry, S-2.1, r.6.

1.18 For all cases in which the work constitutes a construction site as defined in the *Act Respecting Occupational Health and Safety*, R.S.Q., c. S-2.1, the following information and documents must be posted in an area that workers can access easily:

- **notice of opening of worksite;**
- **identification of principal contractor;**
- **company policy on occupational health and safety;**
- **prevention program specific to the worksite;**
- **emergency plan;**
- **safety data sheets for controlled products used on the worksite;**
- **minutes of worksite committee meetings;**
- **names of the worksite committee members;**
- **names of first aid attendants;**
- **action and correction reports issued by the CSST.**

1.19 The Contractor shall mark off and control access to the work area and install barricades as needed.

1.20 The Contractor shall take such measures as are necessary to keep the workplace clean and orderly throughout the work and shall ensure that at the end of each workday, the workplace is free of any hazards.

1.21 When a worker works alone in an isolated place where it is impossible to ask for assistance, the Contractor shall identify the risks related to the situation and provide

the technical officer with a procedure for preventing those risks and quickly getting help in an emergency.

1.22 Where a hazard not identified in the specifications arises as a result of or in the course of the work, the Contractor shall stop work immediately, implement temporary protective measures for workers and the public, and notify the building technical officer orally and in writing. The Contractor shall then make the necessary changes to the prevention program to ensure that work can resume safely.

1.23 In the event of an incident, the Contractor shall take such measures as are needed, including stoppage of work, to ensure the health and safety of workers and the public and shall contact the technical officer promptly.

1.24 Subcontracting is not permitted without special authorization from the building technical officer. In making a decision, the technical officer will consider the subcontractor's ability to meet these requirements.

1.25 Sealing guns and other cartridge devices shall not be used without authorization from the building technical officer.

The above notwithstanding,

- Every person who uses a sealing gun must have a training certificate and meet all of the requirements set out in section 7 of the Safety Code for the Construction Industry, c. S-2.1, r. 6;

- Every cartridge device shall be used in accordance with the manufacturer's instructions and the applicable standards and regulations.

1.26 On the worksite, the Contractor shall consider the following conditions in developing a safe work plan:

There is asbestos in the pipe insulation in some rooms. While there is no requirement in these specifications for handling asbestos, the Contractor shall notify the building technical officer (chief of operations) immediately if such insulation is disturbed during the work or if unscheduled work makes it necessary for the Contractor to handle asbestos.

If the Contractor is asked to carry out work where asbestos dust is likely to be released, the Contractor must comply with the requirements of section 3.23 of the Safety Code for the Construction Industry, an *Act Respecting Occupational Health and Safety*, (R.S.Q., c. S-2.1).

The Contractor may be asked to do roofing work. The Contractor must indicate in its prevention program the measures to be taken to prevent falls.

The Contractor may be asked to do work near a body of water or a holding tank. The Contractor must indicate in its prevention program the measures to be taken to prevent the risk of drowning, electric shock and electrocution.

The Contractor may be asked to do work at heights in the receiving area, in plants or elsewhere. The Contractor must indicate in its prevention program the measures to be taken for work at heights.

The Contractor may be asked to inspect or check electrical rooms. The Contractor must indicate in its prevention program the measures it plans to take to protect people in those areas.

Work in confined spaces may be required. The Contractor must include in its prevention program the measures it intends to take when working in these areas, and take into account the requirements of section 2.4 of the Safety Code for the Construction Industry, the *Act Respecting Occupational Health and Safety*, (R.S.Q., c. S-2.1).

The Contractor may be asked to do work in laboratories. The Contractor shall contact the building technical officer to determine whether special procedures need to be taken.

2. SPECIFIC CLAUSES

2.1 Lock-out

2.1.1 Whenever work is being done on electric equipment that could be powered on inadvertently, the Contractor shall produce in writing and apply a lock-out procedure and complete the disconnect request form (ELF #13) provided by the building technical officer.

The following is a partial list of situations where use of the form is mandatory:

- Main building power supply lines
- Power supply line panels and sub-panels
- Bus bars (shielded)
- Motor control centres
- Back-up power circuits
- Fire alarm and fire protection devices
- Mechanical protection devices (sump pump, etc.)

- Building services alarm circuit, specifically heating, ventilation and air conditioning systems
- Circuits powering two or more pieces of equipment
- Circuits powering a single piece of equipment used in a cooling or heating system

After duly completing the form, the Contractor shall have it countersigned by the workplace supervisor before carrying out any work.

2.1.2 Notwithstanding the preceding clauses, the Contractor shall, in an emergency, obtain oral confirmation of power cut-off from the building technical officer and, as soon as that confirmation is obtained, record in writing the request for electrical cut-off or bypass.

2.1.3 The procedure referred to in clause 2.1.1 shall comply with the principles set out in the brochure on lock-out published by the Association paritaire en santé et sécurité du secteur de la construction (ASP Construction).

2.1.4 The supervisors and workers concerned must have completed the course on lock-out techniques offered by ASP Construction, 514-355-6190 or 1-800-361-6190 or an equivalent course offered by another organization.

2.1.5 For any work that absolutely must be carried out with the power on, the Contractor shall identify the situation in writing and make provision for the preventive measures that will be applied, including personal protective equipment.

2.2 Work at heights

2.2.1 The Contractor shall provide the equipment needed to work at heights (e.g., ladders, stepladders, elevating platforms, scaffolding).

2.2.2 The Contractor shall ensure that every person who does work which entails a risk of falling more than 2.4 metres is protected against falls.

2.2.3 The Contractor shall plan and organize work so as to foster the elimination of hazards at the source or ensure group protection and thus minimize the need for personal protective equipment. Where personal fall protection is needed, workers shall use a safety harness conforming to standard CAN-CSA-Z-259.10-M90. A safety belt shall not be used for fall protection.

2.2.4 Protective equipment, tools or devices that cannot be installed or used without compromising the health and safety of workers or the public are deemed to be inadequate for the work to be performed.

2.2.5 Workers must always wear a safety harness when working on a telescoping, articulated or rotating elevating platform.

2.2.6 Identify a danger zone wherever equipment for work at heights is used.

2.3 Asbestos

Before starting work likely to generate asbestos dust, the Contractor shall:

2.3.1 Provide a written procedure covering all of the items listed in section 3.23 of the Safety Code for the Construction Industry S-2.1, r-6.

2.3.2 Show that all workers concerned have been trained in asbestos hazards and the procedure described above (ASP Construction) (s. 3.23.7).

2.3.3 Show that it has all the equipment needed to comply with the procedure and safely perform the work.

2.4 Confined spaces

PWGSC classifies and evaluates all confined spaces on properties of which it is the custodian. Confined spaces are divided into three classes: 1—low risk; 2—medium risk; and 3—high risk. An evaluation report is produced for every confined space. The report identifies all of the characteristics and entry requirements of the confined space. This report is one of the elements taken into account in issuing permits and developing work procedures.

All confined spaces must be properly identified on the basis of their classification. A PWGSC-approved sign must be posted at the entrance or as close as possible to confined spaces.

2.4.1 Class 1:

For all class 1 (low risk) confined spaces, every person involved shall have completed the basic training. While it is not necessary to implement specific work practices in low-risk confined spaces, the Contractor shall apply methods to ensure the general health and safety of persons required to carry out work in such spaces.

Before accessing the confined spaces, the Contractor shall notify the building technical officer or the supervisor of the scheduled in and out date and time.
Persons with access to low-risk confined spaces must record the relevant information in the confined spaces access log (form ELF 103); in other words,

persons entering a low-risk confined space are required to record every access and exit in the log.

2.4.2 Classes 2 and 3:

For all class 2 and class 3 (medium and high risk) confined spaces, the following measures shall be rigorously applied.

2.4.2.1 The Contractor's prevention program shall contain a written procedure identifying:

- The tools needed to perform the work;
- The equipment installed or to be installed in the confined space and the measures to be taken to install, use, maintain, protect or move the equipment;
- Pipes and conduit entering the confined space;
- The hazards and safety measures to be taken depending on the work to be performed;
- Contaminants that might be encountered in the confined space;
- Appropriate rescue measures and equipment and emergency measures.

2.4.2.2 The Contractor shall complete an access permit (form ELF 101). The permit is valid for one shift and shall take into account the information contained in the evaluation report and any specific conditions related to the work to be performed. The Contractor may use its own form if it contains all the information on the form provided by the workplace supervisor.

2.4.2.3 The Contractor shall complete a Hot Work Permit where the work to be performed includes welding, cutting or any other activity that produces a flame or sparks. (ELF 102)

2.4.2.4 Every person who has access to a confined space shall hold the following training certificates:

- PWGSC Safe Work in Confined Spaces (ASP Construction)
- Workplace First Aid and CPR (organization recognized by the CSST)
- Use of Ventilation Devices (ASP Construction)
- Use of Safety Harnesses (ASP Construction)
- Use and Maintenance of Respiratory Protection Devices (ASP Construction)
- Gas Detection Devices (ASP Construction).

Where the use of supplied-air or self-contained respirators is planned, full training in the preparation, maintenance and use of the devices (manufacturer, supplier or recognized organization) is required.

In remote areas where there is no local emergency response unit, the Contractor shall designate persons to carry out rescue operations in confined spaces. The rescuers designated by the Contractor shall complete relevant training in the use of rescue equipment.

2.4.2.5 Every person who has access to a confined space shall produce a medical certificate confirming his or her fitness to work in a confined space. Such certificates are valid for two years.

2.4.2.6 Employees required to work in sewage collection systems or similar systems shall be vaccinated against infectious diseases in accordance with the immunization program prescribed by Health Canada, that is, against diphtheria and tetanus.

2.4.2.7 While it is mandatory only in the cases referred to previously, vaccination against diphtheria and tetanus is strongly recommended for all work in confined spaces.

2.4.2.8 The Contractor shall establish an emergency and rescue procedure with municipal and ambulance services. The procedure, telephone numbers and location of the nearest telephone shall be clearly posted near the work location.

2.4.2.9 Before entering the confined space and every 15 minutes thereafter, the Contractor shall take readings of the concentration of oxygen, flammable gases and any toxic gases likely to be present, in particular carbon monoxide and hydrogen sulphide. The readings shall be recorded in a log unless the detection devices have an alarm and operate continuously. The detection devices used shall be calibrated and adjusted by a qualified person according to the manufacturer’s instructions so that the alarms comply with the limits set out in the permit.

2.4.2.10 The Contractor shall supply its own gas detection devices and keep them in good condition. The technical officer may have the accuracy of the Contractor's devices checked at any time by a qualified person. If a detection device fails, work shall be suspended immediately, and all workers shall leave the confined

space. No claim for lost time will be accepted in those circumstances.

2.4.2.11 If the alarm on a detection device sounds, all workers shall leave the confined space. The Contractor shall then determine the source of the contamination, neutralize it and ventilate the confined space in order to eliminate any remaining contaminant and shall keep individuals out of the confined space until the oxygen and gas levels have returned to normal.

2.4.2.12 Compressed gas cylinders and welding machines shall not be taken into confined spaces. Such equipment shall remain outside and shall not block any entrance or exit. All cylinders shall be properly secured.

2.4.2.13 Electric tools and devices used to access confined spaces shall be grounded and, if necessary, designed to be explosion-proof. All equipment shall be connected to a ground fault interrupter or stepdown transformer. The Contractor shall, at its own expense, have a qualified electrician modify any power outlets and/or circuit breakers it plans to use which do not meet these criteria.

2.4.2.14 The Contractor shall provide a ventilation system in order to keep the contaminant levels below the allowable limits.

2.4.2.15 The Contractor shall post signs to stop unauthorized persons from entering the confined space.

2.4.2.16 Where it is impossible to keep the noise level below eighty-five (85) dB, the Contractor must provide all workers with ear protectors appropriate to the desired level of attenuation and the work to be performed.

2.4.2.17 The Contractor shall ensure that all workers wear the required personal protective equipment.

2.4.2.18 The Contractor shall assign a qualified person to assume the duties of custodian. The custodian shall:

- Be familiar with the procedure for working in a confined space;
- Ensure constant communication with all workers in the confined space. The directives applied shall be adapted to confined spaces. The Contractor shall select means of

communication taking into account the identified hazards and other pertinent factors, that is, the protective equipment workers are required to wear, noise levels in and near confined spaces, remoteness, lighting conditions, etc.;

- Be familiar with the gas detection devices and ensure that they are in working order throughout the work;
- Be familiar with the back-up ventilation systems and ensure that they are in working order throughout the work;
- Be familiar with emergency procedures;
- Ensure that:
  - ✓ All workers entering the confined space observe the Contractor's work procedure;
  - ✓ Working conditions and the work environment inside the confined space are not detrimental to the workers' health and safety.

2.4.2.19 The custodian shall remain at the entrance to the confined space as long as there is a worker in the space.

2.4.2.20 The Contractor shall designate a person to be in charge of safety in confined spaces. The designated person shall be on the worksite at all times.

2.4.2.21 The same person may not serve as custodian and confined spaces safety officer unless he or she is able to meet the requirements of both positions.

2.5 Hot work

2.5.1 Hot work means any work that involves the use of a flame or has the potential to produce an ignition source, such as riveting, welding, cutting, grinding, burning and heating.

2.5.2 The Contractor shall not start work that involves hot work until it has received a PWGSC Hot Work Permit (ELF 102) from the building technical officer.

2.5.3 Work shall be performed in accordance with Fire Commissioner Standard FC 301, Standard for Construction Operations, June 1982. FC 301 is available at the following Internet address:

http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/301/page00.shtml

2.5.4 A working handheld extinguisher appropriate to the fire hazard shall be available and readily accessible within a radius of 5 m of any flame or source of sparks or intense heat.

2.5.5 A person shall be designated to conduct fire checks for at least 30 minutes after the end of the shift. the person who does the checks shall countersign the permit and give it to the building technical officer (or a designated representative) after the 30-minute period ends.

2.5.6 Propane cylinders shall be stored in accordance with standard CAN/CSA-B149.2-00 Propane Storage and Handling Code and shall meet the specific conditions set out in this document. Cylinders shall be stored outdoors in a safe place where they will not be handled by unauthorized persons, in a storage unit designed for that purpose; they shall be stored securely in an upright position, and the storage unit shall be locked at all times; the storage unit shall be located in an area where there is no vehicle traffic unless the area is protected by gates or an equivalent means.

All cylinders used or stored on worksites shall have a collar designed to protect the valve.

Refilling of cylinders on worksites is not permitted unless a procedure conforming to standard CAN/CSA B149.2 is approved and authorized by the building technical officer.

2.5.7 Welding and cutting

Note: For welding and cutting work, the following conditions must be met in addition to the conditions stated above.

2.5.7.1 Welding and cutting must be performed in accordance with sections "3.13. Compressed gas supply" and "3.14. Welding and cutting" of the Safety Code for the Construction Industry (R.S.Q., c S-2.1, r. 6).

1.5.7.2 Work shall be performed in accordance with Fire Commissioner Standard FC 302, Standard for Welding and Cutting, May 1979. FC 302 is available at the following Internet address:

http://www.rhdcc.gc.ca/fra/travail/protection_incendies/politiques_normes/commissaire/302/page00.shtml

2.5.7.3 Welding and cutting devices are extremely dangerous in terms of fire risk. The following precautions shall be taken when that type of work is being carried out:

- Store compressed gas cylinders on a fireproof surface and ensure that the room is well ventilated.
- Store oxygen cylinders at least 6 metres away from cylinders containing flammable gas (e.g., acetylene) or such combustible materials as oil and grease unless they are separated by a wall made of non-combustible material as specified in section 3.13.4 of the Safety Code for the Construction Industry, c. S-2.1, r.6.
- Put fireproof cloths in place when overhead welding is being done and there is a risk of falling sparks.
- Store cylinders away from heat sources.
- Do not store cylinders near stairs, exits, corridors or elevators.
- To avoid the risk of explosion, do not allow acetylene to come into contact with such metals as silver, mercury, copper and brass alloys containing more than sixty-five percent (65%) copper.
- Make sure that all electric arc welding equipment has the required voltage rating and is grounded.
- Make sure that the lead wires of the electric welding equipment are not damaged.
- Place the welding equipment on a flat surface protected from the weather.
- Remove or protect combustible materials that may be near the welding site.
- Never weld or cut closed containers.
- Take protective measures when welding or cutting near pipes, tanks or other containers containing flammable substances.
- Do not cut, weld or carry out open-flame work on a tank, pipe or other container that may contain a flammable or explosive substance unless:
    - Air samples have been taken and indicate that the work can be done safely; or
    - Measures have been taken to ensure worker safety.

2.6 Scaffolding

2.6.1 Footings

- Scaffolding shall be placed on solid footings so as to prevent it from sliding or tipping.
- If the Contractor wishes to place scaffolding on a roof, an eave, a canopy or a garret, the Contractor shall submit its calculations to the engineer and obtain the engineer's authorization before proceeding.

2.6.2 Assembly, bracing and anchoring

- All scaffolding shall be assembled, braced and anchored in accordance with the manufacturer's instructions and the provisions of the Safety Code for the Construction Industry.
- In situations were it is necessary to remove some scaffolding components (e.g., cross pieces), the Contractor shall submit an assembly procedure signed and sealed by an engineer certifying that the scaffolding will allow work to be carried out safely, taking into account the loads that will be applied.
- Where the span between two scaffolding supports is greater than 3 m, the Contractor shall provide an assembly plan signed and sealed by an engineer.

2.6.3 Fall protection during assembly

- Throughout the assembly process, workers shall be protected against falls.
- Before starting work, the Contractor shall submit to the engineer a procedure specifying the protective measures used and, if applicable, the anchor points for safety cables or retainers. This procedure shall comply with the provisions of sections 3.9.4.5, 2.9.1 and 2.10.12 of the Safety Code for the Construction Industry (as amended on August 2, 2001).

2.6.4 Platforms

- Scaffold platforms shall be designed and installed in accordance with the provisions of the Safety Code for the Construction Industry.
- If planks are used, they shall be approved and stamped in accordance with section 3.9.8 of the Safety Code for the Construction Industry (in force on January 1, 2002).
- Platforms shall cover the entire surface protected by guardrails.
- Notwithstanding the above, scaffolding four sections (or 6 m) high or higher shall have a full platform covering the entire surface of the putlogs every 3 m or portion thereof, and at no time shall the components of such platforms be moved to create intermediate platforms.

2.6.5 Guard rails

- A guardrail shall be installed on every platform.
- Cross-bracing shall not be considered guardrails.
- On scaffolding four sections (or 6 m) high or higher that require full platforms, guardrails shall be installed on every platform at the start of work and shall remain in place until the work is finished.

2.6.6 Access

- The Contractor shall ensure that access to scaffolding does not compromise worker safety.
- When scaffolding platforms are made of beams, ladders must be installed so that the beams that exceed do not hinder the climb or descent.
- Notwithstanding the provisions of the Safety Code for the Construction Industry, stairs shall be installed on all scaffolding with six or more sets of uprights and six sections (or 9 m) high or higher.

2.6.7 Protection of the public and occupants

- The Contractor must mark out and barricade its work area so as to limit access to authorized workers only.
- The Contractor shall install covered walkways, nets or other similar devices to protect the public and occupants from falling objects.

2.6.8 Use of public roads

- Where it is necessary to encroach on a public road, the Contractor shall obtain at its own expense any authorizations and permits required by the competent authority.
- The Contractor shall install at its own expense all signage, barricades and other devices needed to ensure the safety of the public and its own facilities. Ladders shall be installed so as to ensure that planks that extend past the edge do not prevent workers from moving up or down.

  Notwithstanding the provisions of the Safety Code for the Construction Industry, stairs shall be installed on all scaffolding with six or more sets of uprights and six sections (or 9 m) high or higher.

SCOPE OF WORK
MAIN AND SECONDARY ELECTRICAL SUBSTATION
INSPECTION AND MAINTENANCE

1 GENERAL

1. The Contractor shall provide the labour, materials, tools and equipment needed to carry out the maintenance work described in this section on any equipment that is part of the systems described in Appendix A, and any components thereof, and the inspections described in Appendix B.
2. The purpose of the specifications is to keep the equipment in very good working condition. These specifications shall nevertheless be considered a minimum standard according to which the Contractor shall work and in no way constitute the limit of the Contractor's responsibilities and obligations.
3. All work shall be performed in compliance with the most recent version of the *Canadian Electrical Code* and the standards and regulations applicable to this type of work.
4. The Contractor shall provide a printed worksheet listing any defects and/or abnormal conditions in accordance with section 18 of the General Provisions and other related provisions. Failure to meet this requirement may result in a refusal to pay.
5. The Department reserves the right to make changes at any time to the electrical systems covered by these provisions without relieving the Contractor of any of its obligations under the contract.

APPENDIX A

LIST OF EQUIPMENT AND MAINTENANCE FREQUENCY

ANNUAL MAINTENANCE

15 kV equipment in the main substation

Reference #	Item	Location
1-R-I11N1	Isolation switch, 15kV-600A	Main S.S.
1-R-I11N2	Isolation switch, 15kV-600A	Main S.S.
1-R-I11N3	Isolation switch, 15kV-600A	Main S.S.
1-R-I11N4	Isolation switch, 15kV-600A	Main S.S.
1-R-I11N5	Circuit breaker, 15kV-600A	Main S.S.
1-R-I11N6	Circuit breaker, 15kV-600A	Main S.S.
1-R-S6N10	Control relay	Main S.S.
1-R-S6N20	Control relay	Main S.S.
1-R-T6N1	Dry-type transformer, 12.4kV, with two (2) fans	Main S.S.
1-R-T6N2	Dry-type transformer, 12.4kV, with two (2) fans	Main S.S.

600V and 208V equipment in the main substation

Reference #	Item	Location
1-R-I3N13	Removable circuit breaker, 4000A-600V 3ph	Main S.S.
1-R-I3N7	Removable circuit breaker, 4000A-600V 3ph	Main S.S.
1-R-I3N14	Removable circuit breaker, 1600A-600V 3ph	Main S.S.
1-R-I3N8	Removable circuit breaker, 1600A-600V 3ph	Main S.S.
1-R-I3N5	Removable circuit breaker, 1000A-600V 3ph	Main S.S.
1-R-I3N15	Removable circuit breaker, 4000A-600V 3ph	Main S.S.
1-R-I3H15	Removable circuit breaker, 1600A-600V 3ph	Main S.S.
1-R-I3N16	Removable circuit breaker, 1000A-600V 3ph	Main S.S.
1-R-I3N6	Removable circuit breaker, 3000A-600V 3ph	Main S.S.
1-R-I3N17	Removable circuit breaker, 1600A-600V 3ph	Main S.S.
A	Protective relay	Main S.S.
B	Protective relay	Main S.S.
C	Protective relay	Main S.S.
neutral	Protective relay	Main S.S.
1-R-I3H2	Fused disconnect switch, 600V-100A	Main S.S.

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1-R-I3N4	Fused disconnect switch, 600V-400A	Main S.S.
1-R-I3H1	Fused disconnect switch, 600V-400A	Main S.S.
1-R-T2H2	Dry-type transformer, 600V	Main S.S.
1-R-D3H1	Circuit board, 347/600V-3ph-225A	Main S.S.
1-R-L2H1	Circuit board, 120/208V-3ph-225A	Main S.S.
1-R-D3N1	Circuit board, 347/600V-3ph-400A	Main S.S.
1-R-Q6N2	Power factor controller (17 x 60 Kvar)	Main S.S.
1-R-Q6N1	Power factor controller (14 x 60 Kvar)	Main S.S.

600V and 208V equipment in the secondary substation on the 4th floor

Reference #	Item	Location
1-04-I3H11	Removable circuit breaker, 600V-3ph-1600A	Secondary S.S., 4th floor
1-04-I3H10	Removable circuit breaker, 600V-3ph-1600A	Secondary S.S., 4th floor
1-04-I3N10	Removable circuit breaker, 600V-3ph-1600A	Secondary S.S., 4th floor
1-04-R6T1	Junction box, 347/600V-3ph-600A	Secondary S.S., 4th floor
1-04-R10H1	Junction box, 347/600V-3ph-125A	Secondary S.S., 4th floor
1-04-I3H39	Removable circuit breaker, 600V-3ph-1600A	Secondary S.S., 4th floor
1-04-I3N11	Removable circuit breaker, 600V-3ph-1600A	Secondary S.S., 4th floor
MAIN PD4A	Fixed circuit breaker, 600V-3ph-1600A	Secondary S.S., 4th floor
1-04-L3H1	Circuit boards, 347/600V-225A	Secondary S.S., 4th floor
1-04-Y6N1	Manual transfer switch, 347/600V-3ph-100A	Secondary S.S., 4th floor
PD4A	Distribution panel, 347/600V-3ph-1000A	Secondary S.S., 4th floor
1-04-B3H1	Distribution panel, 347/600V-3ph-1600A	Secondary S.S., 4th floor
D4	Distribution panel, 120/208V-3ph-600A	Secondary S.S., 4th floor
1-04-D6T1	Distribution panel, 347/600V-3ph-800A	Secondary S.S., 4th floor
1-04-T2H4	Natural cooled transformer, 600/120/208V-3ph 150kVA	Secondary S.S., 4th floor
1-04-T2T1	Transformer, 30 kVA	Secondary S.S., 4th floor
1-04-T3H1	Transformer, 75 kVA	Secondary S.S., 4th floor
1-04-T2H4	Transformer,150 kVA	Secondary S.S., 4th floor

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1-04-L3H4	Board, 347/600V- 3ph-250A	Secondary S.S., 4th floor
1-04-R3H2	Junction box, 347/600V-3ph-1200A	Secondary S.S., 4th floor
1-04-Y6T1	Isolation disconnect, 600V-600A	Secondary S.S., 4th floor
1-04-L2H2	Board, 120/208V-3ph-225A	Secondary S.S., 4th floor
1-04-L2T1	Board, 120/208V-3ph-100A	Secondary S.S., 4th floor
1-04-L2H3	Board, 120/208V-3ph-225A	Secondary S.S., 4th floor
1-04-L2H4	Board, 120/208V-3ph-225A	Secondary S.S., 4th floor
1-04-Y6T2	Transfer cabinet	Secondary S.S., 4th floor
1-04-I6T2	Service breaker switch	Secondary S.S., 4th floor
1-04-C1T1	Boiler control	Secondary S.S., 4th floor
1-04-T1H1	Transformer, 600/120-240 15kVA	Secondary S.S., 4th floor
1-04-T1H2	Transformer, 600/120-240 15kVA	Secondary S.S., 4th floor
1-04-I1H1	Switch, 240V/30A	Secondary S.S., 4th floor
1-04-I1H2	Switch, 240V/30A	Secondary S.S., 4th floor

600V and 208V equipment in the secondary substation on the 6th floor

Reference #	Item	Location
1-06-I6N2	Main circuit breaker, 600V-3ph-2000A	Secondary S.S., 6th floor
1-06-I6N3	Isolation switch, 600V-3ph-1200A	Secondary S.S., 6th floor
C-SUQ	Starter, 208V-3ph-135A	Secondary S.S., 6th floor
C-STG	Starter, 208V-3ph-135A	Secondary S.S., 6th floor
C-SUP	Starter, 208V-3ph-135A	Secondary S.S., 6th floor
C-SUM	Starter, 208V-3ph-135A	Secondary S.S., 6th floor
C-SUII	Starter, 208V-3ph-135A	Secondary S.S., 6th floor
C-SBI	Starter, 208V-3ph-135A	Secondary S.S., 6th floor
C-SUN	Starter, 208V-3ph-135A	Secondary S.S., 6th floor
C-STI	Starter, 208V-3ph-135A	Secondary S.S., 6th floor
C-STL	Starter, 208V-3ph-135A	Secondary S.S., 6th floor
C-SBF	Starter, 208V-3ph-135A	Secondary S.S., 6th floor
C-STF	Junction box, 208V-3ph-270A	Secondary S.S., 6th floor
C-SUK	Starter, 600V-3ph-27A	Secondary S.S., 6th floor

ANNUAL MAINTENANCE

C-SUJJ	Starter, 600V-3ph-90A	Secondary S.S., 6th floor
C-SBG	Starter, 208V-3ph-90A	Secondary S.S., 6th floor
C-SZZ	Starter, 600V-3ph-90A	Secondary S.S., 6th floor
C-SR	Starter, 600V-3ph-90A	Secondary S.S., 6th floor
C-SBH	Starter, 208V-3ph-90A	Secondary S.S., 6th floor
C-SPP	Starter, 600V-3ph-90A	Secondary S.S., 6th floor
C-SBE	Starter, 208V-3ph-90A	Secondary S.S., 6th floor
C-SO	Starter, 600V-3ph-27A	Secondary S.S., 6th floor
05-153-500	Ground leakage detector, 600V	Secondary S.S., 6th floor
1-06-D2H2 SUV	Circuit board, 120/208V-3ph-400A	Secondary S.S., 6th floor
1-06-D2H1	Circuit board, 120/208V-3ph-400A	Secondary S.S., 6th floor
1-06-B3H1 SUU	Distribution panel, 347/600V-3ph-1200A	Secondary S.S., 6th floor
1-06-B3N1 SS	Distribution panel, 347/600V-3ph-2000A	Secondary S.S., 6th floor
1-06-I6N2	Main switch, 600V/2000A-3ph	Secondary S.S., 6th floor
1-06-I6N3	Circuit breaker, 600V/1200A-3ph	Secondary S.S., 6th floor
1-06-Y2T1	2-position switch, 400A	Secondary S.S., 6th floor
1-06-Y2T2	2-position switch, 400A	Secondary S.S., 6th floor
1-06-R2N1	Junction box, 600V/400A-3ph	Secondary S.S., 6th floor
1-06-R2H1	Junction box, 600V/400A-3ph	Secondary S.S., 6th floor
1-06-B6T10	Siemens panel, 6x 350A, 2x 105A	Secondary S.S., 6th floor
1-06-B6T20	Siemens panel, 6x 350A, 2x 105A	Secondary S.S., 6th floor
1-06-16N10	Siemens panel, 120/208 200A	Secondary S.S., 6th floor
1-06-16H20	Siemens panel, 120/208 200A	Secondary S.S., 6th floor
1-06-T2H4 T-SUV	Natural cooled transformer, 600/120/208V-3ph-112.5kVA	Secondary S.S., 6th floor
1-06-T2H5 T-SBE	Isolating transformer, 208/208V-3ph-15kVA	Secondary S.S., 6th floor
1-06-T2N5 T-SPP	Natural cooled transformer, 600/120/208V-3ph-15kVA	Secondary S.S., 6th floor

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1-06-T2H6 T-SBF	Isolating transformer, 208/208V-3ph-30kVA	Secondary S.S., 6th floor
1-06-T2H7 T-SBG	Isolating transformer, 208/208V-3ph-15kVA	Secondary S.S., 6th floor
1-06-T2N10	Transformer, 600V-120/208-3ph, 112.5 kVA	Secondary S.S., 6th floor
1-06-T2H20	Transformer, 600V-120/208-3ph, 112.5 kVA	Secondary S.S., 6th floor
1-06-I6N1	Switch in the well, 600V-3ph-1200A	Secondary S.S., 6th floor

600V and 208V equipment in the Solicitor General penthouse

Reference #	Item	Location
1-A-I6H50	Isolation switch, 600V-3ph-800A	S.G. penthouse
1-A-D3H2	Distribution panel, 347/600V-3ph-400A	S.G. penthouse
1-A-D3N2	Distribution panel, 347/600V-3ph-400A	S.G. penthouse
1-A-T2H2	Natural cooled transformer, 600/120/208V-3ph-15kVA	S.G. penthouse
1-A-T2N2	Natural cooled transformer, 600/120/208V-3ph-15kVA	S.G. penthouse
1-A-L2H2	Circuit board, 120/208V-3ph-225A	S.G. penthouse
1-A-L2N2	Circuit board, 120/208V-3ph-225A	S.G. penthouse
7-A-M6H1	MCC (31 drawers + main switch)	S.G. penthouse
1-A-M6N2	MCC (11 drawers + main switch)	S.G. penthouse
1-A-V6H1	Drive 10HP 600V-3ph	S.G. penthouse
1-A-V6H2	Drive 10HP 600V-3ph	S.G. penthouse
1-A-V6H3	Drive 15HP 600V-3ph	S.G. penthouse
1-A-V6H4	Drive 15HP 600V-3ph	S.G. penthouse
1-A-V6N6	Drive 10HP 600V-3ph	S.G. penthouse
1-A-V6N7	Drive 15HP 600V-3ph	S.G. penthouse
1-A-V6N8	Drive 15HP 600V-3ph	S.G. penthouse
1-A-V6N9	Drive 10HP 600V-3ph	S.G. penthouse
1-A-16B10	Disconnect switch for batteries	S.G. penthouse
1-A-16B20	Disconnect switch for batteries	S.G. penthouse

ANNUAL MAINTENANCE

Motor Control Centres

Télémécanique motor control centre

- In the penthouse machinery room, MCC #1 (1-A-M6N1), 2000A, 600V, 3 Ø, 3-wire, 12 cells, 1 Westinghouse 2000A main circuit breaker, 2 400A disconnects, 4 200A disconnects, 4 100A disconnects, 4 60A disconnects, 11 combination starters with disconnect, 1 transformer and 1 panel, 100A, 120/240V, 1 Ø, 3-wire, 16C-20A-1 pole and 1C-20A-2 pole.

- In machinery room #4, MCC #6 (1-R-M6N1), 100A, 600V, 3 Ø, 3-wire, 2 cells, 1 100A main disconnect, 3 combination starters with disconnect, 1 disconnect for 15A 600V transformer, 1 3kVA transformer, 1 circuit breaker panel (2-15A-1 pole) 4 spaces.

Siemens motor control centre

- In the boiler room of basement #2, MCC #2 (1-S2-M6H1), 600A, 600V, 3 Ø, 3-wire, 3 cells, 1 400A main disconnect, 12 30A disconnects, 5 combination starters with disconnect, 5 spaces.

- On the mezzanine of the boiler room of basement #1, MCC #3 (1-S1-M6H1), 600A, 600V, 3 Ø, 3-wire, 4 cells, 1 200A main disconnect, 21 30A disconnects, 9 spaces.

- On the mezzanine of the boiler room of basement #1, MCC #4 (1-S1-M3N1), 1000 A, 600 V, 3 Ø, 3-wire, 5 cells, 1 600A main disconnect, 5 30A disconnects, 10 combination starters with disconnect, 7 spaces.

- In machinery room #3, in basement #1, MCC #5 (1-S1-M6N1), 600A, 600V, 3 Ø, 3-wire, 2 cells, 1 100A main disconnect, 10 combination starters with disconnect, 5 spaces.

Power factor controllers

- PFC #1 (17 X 60 Kvar)
- PFC #2 (14 X 60 Kvar)

FIVE-YEAR MAINTENANCE

Cable troughs for busbars

Seven (7) cable troughs for busbars on the normal system

- One (1) cable trough connecting cell C2 of the main substation and the distribution substation in the electrical room on the 4th floor. Westinghouse model LoZ, 1600A, 347/600V, 3 Ø, 4-wire. Approximate distance of 125 metres.
- One (1) cable trough connecting cell B2 of the main substation and the distribution substation in the electrical room on the 4th floor. Westinghouse model LoZ, 1600A, 347/600V, 3 Ø, 4-wire. Approximate distance of 125 metres.
- One (1) cable trough connecting cell A1 of the main substation and motor control centre #4 in the boiler room of mezzanine S1. ITE model XL Universal, 3000A, 347/600V, 3 Ø, 4-wire. Approximate distance of 110 metres.
- One (1) cable trough connecting cell A2 of the main substation and the electrical room of the Solicitor General on the 6th floor. ITE model XL Universal, 3000A, 347/600V, 3 Ø, 4-wire. Approximate distance of 125 metres.
- One (1) cable trough connecting cell D2 of the main substation and the distribution substation in the electrical room on the 4th floor. Federal Pacific Electric (FPE) model, 1600A, 347/600V, 3 Ø, 4-wire. Approximate distance of 95 metres.
- Two (2) cable troughs connecting the main substation and each of the power factor correctors in the main electrical room. ITE model XL Universal, 800A, 600V, 3 Ø, 3-wire. Approximate distance of 7 metres each.

Two (2) cable troughs for busbars on the emergency system

- One (1) cable trough connecting the transfer switch of cell F1 of the main substation and the electrical room of the Solicitor General on the 6th floor. Federal Pacific Electric (FPE) model, 1600A, 347/600V, 3 Ø, 4-wire. Approximate distance of 140 metres.

- One (1) cable trough connecting the transfer switch of cell F1 of the main substation and the electrical room on the 4th floor. Federal Pacific Electric (FPE) model, 1600A, 347/600V, 3 Ø, 4-wire. Approximate distance of 95 metres.

APPENDIX B

MAINTENANCE SCHEDULE

Type of system: Main and secondary electrical distribution systems.

Maintenance frequency:

In order to minimize power shutdowns in each sector of the building, as soon as the contract is awarded, the Contractor, with the assistance of the Technical Authority of the building, shall prepare a work schedule that groups the work for each sector. The schedule shall take the maintenance frequency below into consideration.

1. Inspection or maintenance of cable troughs for busbars shall be done once every five years but may be done completely in years 1 through 5 of the contract or distributed over these five years.

2. Inspection of moulded-case circuit breakers (section 4.6.2) at 300% of the rated value of the trip unit, **which have a capacity of less than 200 amperes**, shall be done once every five years but may be done completely in years 1 through 5 of the contract or distributed over these five years.

3. All other equipment and devices shall be inspected and maintained according to the frequency set out in Appendix A.

1: Drawings	.1	No drawings are attached to these specifications.
2: General	.1	Work is limited to the following and excludes repairs other than those required as part of the work.
	.2	All repairs and/or inspections shall be carried out in strict compliance with the instructions from manufacturers and suppliers, when available, and in all cases shall follow best practices and accepted methods.
	.3	No repairs shall be made without the prior approval of the Manager concerned or the Manager's representative.
	.4	Repairs shall be made as described in section 1GE of these specifications. The parts shall be original or equivalent to the existing parts.
	.5	The buildings, components and adjacent areas shall be kept clean at all times.
	.6	After inspections, provide all required inspection reports, certificates and other documents.
	.7	Report any abnormal conditions identified but not resolved.
3: Special instructions	.1	Comply with the safety standards that apply to such work.

	.2	Before carrying out the work, obtain the required approval from the Building Manager or the Departmental Representative so as not to interfere with normal building operations.
	.3	Work on 15-kV equipment shall be done by a firm with five years of experience in maintaining high voltage substations and holding a valid Master Electrician licence “A”. Persons authorized to perform work on 15-kV equipment shall be specialized in high voltage work, and measuring and protective devices, and have; ❑ A safety certificate or credentials for the work required, and ❑ Recognized certification in electricity (licence “C”)
	.4	Work on 600 / 347 / 208 / 120 V equipment shall be done by a firm with personnel holding recognized certification in electricity (licence “C”). The firm itself shall hold a valid licence for the work and shall have five years of experience in the field.
	.5	Prior to carrying out the required work, co-ordinate all powering off of electrical services with the authorized representatives of Hydro-Quebec and the Manager or Departmental Representative.
	.6	Supply and install, if necessary, all emergency devices and equipment required to maintain certain services.
	.7	Record the results of all tests requested in a report. Read related literature, note the deficiencies observed and precisely describe each one.
	.8	Use an infrared thermography device and record all abnormal conditions identified in the report. Accompany everything with photos and thermograms. Any devices and equipment that show any sort of deficiency in the thermographic inspection shall also be inspected while powered off and the results shall be an integral part of the requested report, accompanied by the repair costs for each.
4: <u>Description of work</u>	.1	<u>15 kV system</u> <u>Substation</u> 1) Inspect and clean the potheads. 2) Inspect and clean the strain insulators of all devices and the

		protective devices. 3) Thoroughly clean equipment and devices, including the inside and outside of all components to be inspected. Vacuum all cells and compartments. 4) Remove any coatings or deposits of grease, dust, etc. 5) Check the busbars and tightness of all bolts with a torque wrench. Check and retighten all connections, if required. 6) Check the insulation resistance of busbars and cables. 7) Inspect and clean the contacts of load-break disconnects and lubricate according to manufacturer's instructions. 8) Check (and adjust if necessary) the operation and alignment of load-break disconnects. 9) Check the continuity of fuses, coat contact surfaces with anti-rust product and measure the resistance of fuses using a Ducter. 10) Check the ground integrity and continuity. 11) Inspect, clean, lubricate and adjust the locking system, as required.
	.2	<u>High voltage cables</u> 1) Check the insulation resistance using a 1000V Megger. Duration of each test must be one minute. 2) If the insulation resistance is satisfactory, conduct a high voltage direct current test using a high voltage device capable of differentiating between leakage current due to corona effect and leakage current through the insulation. Cable tests shall be done according to the manufacturer's specifications or those supplied by the client. 3) Check the power dissipation factor. 4) Produce a detailed report of the inspections and tests conducted.
	.3	<u>Relays</u> <u>A) Visual and mechanical inspections</u> 1) Examine the housing to ensure that the short circuit trips are in good operating condition. 2) Clean the relays. 3) Look for foreign particles on the permanent magnet. 4) Inspect the pivots in the disk shaft.

		5) Ensure the adjusting spring is uniform. 6) Inspect the main contacts and pilot contacts for pitting. 7) Check the tightness of all electrical connections. <u>B) Electrical tests</u> 1) Do a zero adjustment. 2) Run a test to evaluate the operating threshold of the timing unit. 3) Run a test to evaluate the disengagement current. 4) Run a test to evaluate the time-current characteristics. 5) Run a hold test (if applicable). 6) Run a slope percentage test. 7) Run a test to evaluate the operating threshold for the instantaneous unit. 8) Test the operation of the pilot and locking mechanism. 9) Run an insulation test (1000 volts DC). Produce a complete report of all tests conducted.
	.4	<u>Main 347/600 volt distribution substation and secondary substations</u> 1) Thoroughly clean equipment and devices, including the inside and outside of all components to be inspected. 2) Remove any coatings or deposits of grease, dust, etc. Check the busbars and tightness of all bolts with a torque wrench. Check and retighten all connections, if required. 3) Clean and vacuum all cells. 4) Inspect the condition of cables and insulators. 5) Check the ground integrity and continuity. 6) Clean the relays and measuring instruments, check the tightness of electrical connections and check that each component operates properly within its respective adjustment range. 7) In the report, record at least three temperature readings for the main electrical room, taken during the day and at regular intervals when all devices are operating.

		8) Check load level and balancing.
	.5	Low voltage circuit breakers <u>A. Visual and mechanical inspections:</u> 1) Pull out the circuit breaker and ensure that it cannot touch the contacts. 2) Remove the circuit breaker from its housing and clean both circuit breaker and housing. 3) Inspect the clamps on the circuit breaker's release mechanism. 4) Clean the main and auxiliary connection pins. 5) Remove the interrupter chambers and inspect for pieces of porcelain or bakelite that might be broken. 6) Switch the circuit breaker on and off at least three times to ensure movement without rubbing or sticking. 7) Check the alignment and pressure of the contacts. 8) Adjust the stop on the trip bar to ensure that the bar has a clear path at all times and will trip properly. 9) Inspect the trip coil and auxiliary circuits of electrically operated circuit breakers. 10) Clean the contacts after the electrical tests. <u>B. Electrical tests:</u> 1) Check the operating threshold of the timing unit on the circuit breakers with removable pneumatic and hydraulic damping mechanisms. The check cannot be carried out on circuit breakers with fixed hydraulic damping mechanisms on which the timing unit cannot be removed. Adjust the operating threshold of the timing unit to the co-ordination curves available; otherwise, adjust it to the values supplied by the client or to standard curves. 2) Check the characteristics of the current time at two locations and compare them to the co-ordination curves. Adjust as required so that the settings match the co-ordination curve, the values supplied by the client or standard curves. 3) Adjust the operating threshold for the instantaneous unit to the co-ordination curves or standard curves. Check that this value is reached.

		4) Adjust the motion threshold for the time-delayed unit to the co-ordination curves or standard curves. Check that this value is reached. Conduct another test at a value that is significantly higher than the threshold to be certain that it operates within the time required. 5) Measure the resistance of the poles using a Ducter (device used to measure the very low resistance of contacts) or an equivalent approved device, after burnishing the contacts. 6) Measure the insulation resistance at 1000VDC. 7) Produce a complete report of tests conducted.
	.6	<u>Moulded-case circuit breakers</u> .1 Ensure that circuit breakers have not overheated. .2 Check at 300% of the rated value of the trip unit and compare the results with the manufacturer's specifications. (**See Maintenance Frequency, page 1 of 9**). .3 Check the instantaneous trip unit and adjust it to the values of the co-ordination curve or the values supplied by the client. .4 Check the tightness of all connections.
	.7	<u>Disconnects</u> 1. Inspect the connections at the terminals. 2. Check the mechanism's condition and that it operates properly. 3. Inspect the mountings and fuse holder. 4. Check the load.
	.8	<u>Power factor controller</u> 1) Thoroughly clean equipment and devices, including the inside and outside of all components to be inspected. 2) Remove any coatings and deposits of grease and dust. 3) Clean and vacuum all cells. 4) Check and adjust the electronic controls. 5) Check each component; fuses, capacitors, etc. 6) Inspect and tighten all electrical connections as required. 7) Take a reading of the harmonics and check the hot spots. 8) Inspect the capacitors and after the work, ensure that the number of capacitors connected maintains the total reactance below the required values.

	.9	Label .1 Affix a label to the cell of the main circuit breaker, enter the date of the last maintenance service, the Contractor's name and the reference.
	.10	Cable trough for busbars 1) Inspect the mountings. 2) Check the busbars and tightness of all bolts with a torque wrench. 3) Inspect and tighten all connections as required. 4) Check the ground integrity and continuity. 5) Remove any coatings or deposits of grease, dust, etc., on all inside and outside surfaces.
	.11	<u>Dry-type transformers</u> .1 Inspect the magnetic ground, windings, connection terminals, voltage taps, bushings and surfaces of the transformer to detect broken parts, foreign bodies or humidity. .2 Using a Megger with a resolution of 50,000 megohms, check the insulation resistance and adjust the value of the readings to 20 degrees C. - Between the high voltage and ground, with the low voltage connected to the ground for the duration of the test. - Between the low voltage and ground, with the high voltage connected to the ground for the duration of the test. - Between the high and low voltage, connected to each other and ground. .3 Check the tightness of all connections. .4 Electronically check that the magnetic ground is grounded at a single point only. .5 Check the transformer ratio on all the transformer taps. .6 Ensure that transformer taps are set at the value to give the required output voltage (on non-automatic voltage taps). .7 Ensure that clamps and transportation bracing have been removed. .8 Inspect the fan system to ensure it is working properly.
	.12	<u>Junction boxes, distribution panelboards and lighting panelboards</u> .1 Inspect the mountings.

		.2 Inspect the terminal connections. .3 Inspect the circuit breakers and fuses. .4 Check the voltage and amperage. .5 Check the ground and fastness of conduits and connectors. .6 Inspect the condition of the housing.
	.13	<u>Motor control centres</u> 1) Thoroughly clean equipment and devices, including the inside and outside of all components to be inspected. 2) Remove any coatings or deposits of grease, dust, etc. Check the busbars and tightness of all bolts with a torque wrench. Check and retighten all connections, if required. 3) Clean and vacuum all cells. 4) Inspect the condition of cable insulation and busbar mountings. 5) Check the ground integrity and continuity. 6) Check the voltage between the phases. 7) Check the amperage between phases A-B, B-C and C-A. 8) Clean the relays and measuring instruments, check the tightness of electrical connections and check that each component operates properly within its respective adjustment range. 9) Inspect the circuit breakers according to 4.6 above. 10) Inspect the disconnects according to 4.7 above. 11) Inspect the relays, terminal blocks, starters, magnetic contactors, control transformers, selectors, push-buttons, annunciator lamps, etc., as follows; ❑ Check the operation. ❑ Check the operating sequences. ❑ Clean the different components. ❑ Inspect the terminal connections. ❑ Inspect the condition of the insulation of the conductors. ❑ Check the rating of the overload and short-circuit protection and adjust as required. ❑ Check the ground leakage.

		❑ Inspect the condition of contacts and coils. ❑ Check the operating voltage and amperage. ❑ Inspect the mounting and condition of the housing.