

SCCG4-00216812

Submitted: January 30, 2015



**Correctional Service Canada  
Drummond Establishment**

**Switchgear replacement**

Technical Specification  
For bidding

**Les Services exp inc.**  
150 Marchand Street, Suite 600  
Drummondville, Québec, J2C 4N1  
Phone : 819 478-8191  
Fax : 819 478-2994

# Correctional Service Canada

## Switchgear replacement

### Technical Specification

For bidding

**Project Number:**

SCCG4-00216812

**Prepared by:**

**Les Services exp inc.**

150 Marchand Street, Suite 600  
Drummondville, Quebec, J2C 4N1

Phone: 819 478-8191

Fax: 819 478-2994

[www.exp.com](http://www.exp.com)

---

Philippe Tremblay, P. Eng.

O.I.Q. #: 136875

**Date Submitted:**

2015-01-30



|                    | PAGE  |
|--------------------|---|
| <b>DIVISION 01</b> | <b>GENERAL REQUIREMENTS</b>   |
| 01 11 00           | Summary of work 7   |
| 01 33 00           | Submittal procedures 5  |
| 01 35 13           | Project procedures relative to security requirements of<br>Correctional services Canada 8 |
| 01 35 29.06        | Health and safety requirements 5  |
| 01 45 00           | Quality control 2   |
| 01 73 00           | Execution 3   |
| 01 74 11           | Cleaning 3  |
| <b>DIVISION 26</b> | <b>ELECTRICITY</b>  |
| 26 05 20           | Wire and box connectors (0-1000 V) 2  |
| 26 05 21           | Wires and cables (0-1000 V) 4   |
| 26 05 34           | Conduits, conduit fastenings and conduit fittings 3                                       |
| 26 23 00           | Low voltage switchgear 6  |
| 26 28 16.01        | Air circuit breakers 4  |

**END OF SECTION**

**PART 1 GENERAL**

**1.1 REFERENCES**

- .1 National Building Code of Canada (NBC) 2010, including all amendments up to the date of bid closing.

**1.2 RELATED REQUIREMENTS**

- .1 Section 01 35 13 Project procedures in compliance with Correctional Service Canada security requirements.

**1.3 DESCRIPTION OF THE WORK**

- .1 The project includes the following work. The list below is not necessarily exhaustive and in no way releases the Contractor from the obligation of carrying out the project in its entirety according to generally accepted practices as well as the intentions and general principles as described in these specifications and drawings.
  - .1 4000A Switch gear replacement.
  - .2 Installation of a remote control for five breakers.
  - .3 Calibrate the new circuit breaker and protection relays.
  - .4 Provide temporary power for the identified loads.

**1.4 SITE INSPECTION BY BIDDERS**

- .1 For security reasons at the penitentiary, the site inspection shall be conducted at a set time that will be specified in the tender documents. The meeting place will be the main entrance of the institution concerned. **The site inspection is mandatory.**
- .2 The Contractor shall examine the site and conditions that could have an impact on the work prior to submitting his proposal. Submitting a bid indicates that the bidder accepts the terms and conditions of the solicitation and agrees to be bound by them.

**1.5 SECURITY SCREENING**

- .1 All workers shall undergo security screening in order to be granted a security classification as required by the Correctional Service of Canada and Public Works and Government Services Canada.
- .2 Section 01 35 13 provides a detailed description of the procedures involved in the security screening.

- .3 At the start of work, a job-site special meeting will be held with institution representatives to define the instructions governing security and site operation in a correctional environment.

## **1.6 CODES**

- .1 The specifications will require that the work and materials comply with the National Building Code of Canada (NBC) and all other applicable provincial or local codes. The strictest requirements shall apply in case of contradiction or discrepancy.
- .2 The work shall be performed in a manner that meets or exceeds the following requirements:
- .1 Contract documents
  - .2 Specified standards and codes as well as other documents cited as references

## **1.7 CONTRACTOR'S USE OF THE SITE**

- .1 The institution must remain fully operational during construction. With this end in view, the CSC Project Manager or the institution's head of security can require the Contractor to halt work immediately on a temporary basis to prevent institution activities from being compromised.
- .2 Use of premises; limited access to the job site. Work and affected engineering structures outside the construction site must be carried out by a crew accompanied by an escort provided by CSC (see section 01 35 13).
- .3 The Contractor shall perform the work so as to disturb the occupants as little as possible and, to the degree possible, ensure that normal use can be made of the facilities. The Contractor shall also cooperate with the CSC Project Manager to facilitate performance of the work.
- .4 Existing services in the buildings must be maintained during the project.
- .5 No vehicle or mobile construction equipment shall remain on institution premises outside of working hours. All construction vehicles must be parked in the lot in front of the postern (main entrance). Refer to section 01 35 13.

## **1.8 CONTRACTOR USE OF PREMISES**

- .1 The site can be used according to the rules and regulations of section 01 35 13 – Project procedures in compliance with Correctional Service Canada security requirements.
- .2 The use of premises is limited to the zones necessary to carry out the work.
- .3 Co-ordinate use of premises under direction of the Director of the establishment.
- .4 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .5 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

## **1.9 OWNER OCCUPANCY**

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Work must be done at night. Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

## **1.10 CONTRACTOR FURNISHED ITEMS**

- .1 Contractor Responsibilities:
  - .1 Receive and unload products at site.
  - .2 Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.
  - .3 Handle products at site, including uncrating and storage.
  - .4 Protect products from damage, and from exposure to elements.
  - .5 Assemble, install, connect, adjust, and finish products.
  - .6 Provide installation inspections required by public authorities.
  - .7 Repair or replace items damaged by Contractor or subcontractor on site under his control.

## **1.11 CONSULTANT RESPONSIBILITIES**

- .1 Designate submittals and delivery date for each product in progress schedule.
- .2 Review shop drawings, product data, samples, and other submittals. Submit to Ministerial representative notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.

## **1.12 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING**

- .1 Execute work with least possible interference or disturbance to building operations and normal use of premises. Arrange with the Director of the establishment to facilitate execution of work.

## **1.13 EXISTING SERVICES**

- .1 Notify, the Director of the establishment and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give the Director of the establishment 48 hours' notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions.

- .3 Submit schedule to and obtain approval from the Director of the establishment for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

#### **1.14 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .5 List of Outstanding Shop Drawings.
  - .6 Change Orders.
  - .7 Other Modifications to Contract.
  - .8 Field Test Reports.
  - .9 Copy of Approved Work Schedule.
  - .10 Health and Safety Plan and Other Safety Related Documents.
  - .11 Other documents as specified.

#### **1.15 ACCEPTANCE OF EQUIVALENTS**

- .1 When products, material, or equipment are specified by brand or trade name or the manufacturer's or supplier's name, the bid shall be based on the designated products, material, or equipment. During the tender period, the substitution can be considered if the contracting authority receives, in writing, complete technical data at least ten (10) days before the deadline specified in the tender documents. If a substitution is approved for tendering purposes, an addendum to the tender documents will be issued.
- .2 The Contractor shall be responsible for providing supporting data of equivalence. The substitution request must be presented clearly and include all the details required to analyze it properly.
- .3 The main criteria for accepting substitutions are: construction, performance, capacity, dimensions, arrangement of connections, availability of replacement parts, ease of maintenance, delivery times, the existence of similar equipment in service for some time.
- .4 If a proposed substitution requires changes to installations shown on plans or in specifications, the General Contractor shall be responsible for such changes and shall also assume responsibility for the ensuing modifications that may be required to the work of specialized subcontractors.

**1.16 COST BREAKDOWN**

- .1 With the bid, the Contractor shall present an itemized breakdown of the costs related to this contract, including the overall contract value, **on the bid summary provided as an attachment**. Once approved, the cost breakdown will be used as a baseline for calculating progress payments.

**1.17 PAYMENT**

- .1 Payments shall be made monthly on a pro rata basis according to work progress. Before submitting an invoice, the Contractor shall submit an itemized request for payment, as per the bid summary, for approval with the percent of progress for each item. Ten percent of the total amount of the request for payment, before tax deductions, will be held back. The hold back is payable upon final acceptance of the work.

**1.18 NOISY ENVIRONMENT AND CELL-PHONE USE**

- .1 No radios or "boom boxes" shall be tolerated at the job site.
- .2 Cell telephones are prohibited within the perimeter of the penitentiary.

**1.19 PARKING AT THE SITE**

- .1 The Contractor shall restrict parking to those areas authorized by the Institutional Head.

**1.20 JOB-SITE MEETINGS**

- .1 Job-site meetings shall be held at times and places subject to the approval of the CSC Project Manager.
- .2 All participants shall be informed of meetings being called.
- .3 The Engineer shall organize job-site meetings, set their dates and times, and ensure that minutes are drafted and distributed.

**1.21 SUPPLEMENTAL DRAWINGS**

- .1 The Engineer may provide supplemental drawings for clarification. Such supplemental drawings shall be considered to have the same meaning and scope as the contract documents.

**1.22 RESTRICTIONS RELATED TO TOBACCO USE**

- .1 Restrictions regarding the use of tobacco inside buildings shall be complied with.



**1.23 ASBESTOS**

- .1 Removing sprayed or troweled-on asbestos can be a health risk. If, during the course of the work, the Contractor encounters materials that appear to be sprayed or troweled-on asbestos, he shall halt work and immediately inform the Engineer. Work shall not be resumed unless so authorized in writing by the Engineer.

**1.24 PERSONNEL TRAINING**

- .1 The Contractor shall provide two (2) periods of training:
  - .1 One for personnel in charge of systems maintenance and new installations.
  - .2 One for system users.

**1.25 PLAN CONFORME À L'EXISTANT**

- .1 One copy of drawing for construction will be kept on site, all changes will be noted with a red ink pen on the drawings as work progress.
- .2 The contractor will provide two (2) copies of the as built drawing for the project files.
- .3 Keep drawing and note all differences from contract documents, changes made for site conditions and changes form change order.
- .4 Note information as:
  - .1 Changes made on site to dimensions and execution detail.
  - .2 Changes made as result of changes order and order given on site.
- .5 At the end of the work, contractor will provide two (2) paper copies of the as built drawings. If more than two (2) copies are needed, additional copies will be charge to the client.

**PART 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not used.

**PART 3 EXECUTION**

**3.1 NOT USED**

.1 Not used.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 ADMINISTRATIVE**

- .1 Submit to Ministerial Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Ministerial Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents by the contractor. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Ministerial Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Ministerial Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Ministerial Representative review.
- .10 Keep one reviewed copy of each submission on site.

### **1.2 SHOP DRAWINGS AND PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in Québec.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

- .4 Allow 5 work days for Ministerial Representative's review of each submission.
- .5 Adjustments made on shop drawings by Ministerial Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Ministerial Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as Ministerial Representative may require, consistent with Contract Documents. When resubmitting, notify Ministerial Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .8 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Material and fabrication details.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erection details.
    - .4 Capacities.
    - .5 Performance characteristics.
    - .6 Standards.
    - .7 Operating weight.
    - .8 Wiring diagrams.
    - .9 Single line and schematic diagrams.
    - .10 Relationship to adjacent work.

- .9 After Ministerial Representative's review, distribute copies.
- .10 Submit one (1) paper copy and one (1) electronic copy of shop drawings for each requirement requested in specification Sections and as Ministerial Representative may reasonably request.
- .11 Submit one (1) electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Ministerial Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit one (1) paper copy and one (1) electronic copy of test reports for requirements requested in specification Sections and as requested by Ministerial Representative.
  - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
  - .2 Testing must have been within three (3) years of date of contract award for project.
- .13 Submit one (1) paper copy and one (1) electronic copy of certificates for requirements requested in specification Sections and as requested by Ministerial Representative.
  - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
  - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit one (1) paper copy and one (1) electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Ministerial Representative.
  - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit one (1) paper copy and one (1) electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Ministerial Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit one (1) paper copy and one (1) electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Ministerial Representative.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Ministerial Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

- .21 The review of shop drawings by Correctional Services Canada is for sole purpose of ascertaining conformance with general concept.
- .1 This review shall not mean that the Minister approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
  - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

### **1.3 PHOTOGRAPHIC DOCUMENTATION**

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution as directed by Ministerial Representative and one hard copy at the end of the project.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: 2 locations.
  - .1 Viewpoints and their location as determined by Ministerial Representative.
- .4 Frequency of photographic documentation: as directed by Ministerial Representative.

### **1.4 WORK SCHEDULE**

- .1 Submit one (1) paper copy and one (1) computerised copy of the planed work schedule to the ministerial representative.
- .2 Work schedule must include:
  - .1 Date and period for preparation work.
  - .2 Date of order and delivery delay of materials.
  - .3 Detail calendar and work sequence planned for the switchgear replacement.

## **PART 2 PRODUCTS**

### **2.1 NOT USED**

- .1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

.1 Not Used.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 OBJECT**

- .1 See that the project as well as the usual activities of the establishment proceed without interruption and that the security of the establishment is maintained at all times.

### **1.2 DEFINITIONS**

- .1 « Prohibited items » include:
- .1 All intoxicants including alcoholic beverages, drugs or narcotics, energy drinks;
  - .2 Weapons or parts of weapons, ammunition as well as all objects designed to kill, injure or neutralize a person, or all objects modified or assembled to do so, unless possession was pre-authorized;
  - .3 Bombs, explosives or their parts;
  - .4 Amounts of money in excess of \$25.00;
  - .5 All other articles not described in points .1 to .4 that could compromise the security of the people or the penitentiary.
- .2 « Unauthorized smoker's articles » designate all tobacco related products including, but without limiting itself to, cigarette, cigars, tobacco, chewing tobacco, snuff, cigarette roller, matches and lighters.
- .3 « Commercial vehicle »: designates all motorised vehicles destined for the transportation of material, equipment or tools required for the project.
- .4 « CSC » designates Correctional Services Canada.
- .5 « Director » designates the director of the establishment or their authorized representative.
- .6 « Construction workers » designates all employees of the contractor, the sub-contractors, equipment operators, material manufacturers, laboratories (expertise and inspection), and the organisations responsible of regulations.
- .7 « Ministerial representative » designates the project manager of Public Works, Government Services Canada (PWGSC) or Correctional Services Canada depending on the project.
- .8 « Construction zone » designates the area where, as indicated in the contractual documents, the contractor will be authorized to work. This area can or cannot be isolated from the security enclosure of the establishment. In the present project the construction zone will be defined by the CSC security gates and the contractor's construction site gates. There will be only one access point to enter and exit the site.



### **1.3 PRELIMINARY MEASURES**

- .1 Before beginning the project, the contractor must meet with the director to:
  - .1 discuss the scope of the project and all adjacent activities;
  - .2 establishes security measures, accepted by each party, in conformity with the present specification and to specific needs of the establishment.
- .2 The contractor must:
  - .1 ensure that all construction workers know the CSC security requirements;
  - .2 ensure that the CSC security requirements be clearly and visibly posted at the construction site;
  - .3 collaborates with the establishment's personnel to ensure that all construction workers respect all the security requirements.

### **1.4 CONSTRUCTION WORKERS**

- .1 The contractor must submit, to the director, a list of the names and birth dates of all the employees that must work on the construction site, as well as the a security verification form duly completed for each employee.
- .2 Allow two (2) weeks for the processing of the security authorization requests. No employee will be permitted to enter the establishment without an approved security authorization as well as a recent photo ID such as provincial driver's license. Security authorizations are required for each CSC establishment and an authorization obtained at another establishment will not be valid for this establishment or the present project.
- .3 The director can demand that the faces of all the construction workers be photographed and that the pictures be posted in certain appropriate areas and/or transferred into a database for identification needs. The director can demand that a photo ID be produced for all construction workers. These ID's will have to be left at a designated entrance where they will be delivered to each employee upon their arrival at the establishment. They must be worn and clearly visible at all times while the employee is at the establishment.
- .4 Access to the establishment's property is prohibited to all persons that may represent a risk for security.
- .5 All employees of the construction site will be immediately expelled from the property if they:
  - .1 seem to be under the influence of alcohol, drugs or narcotics
  - .2 present abnormal or rowdy behavior
  - .3 has a prohibited item in their possession

### **1.5 VEHICLES**

- .1 All persons leaving an unattended vehicle on the CSC's property must close the windows, lock the doors and trunk and remove the keys. The owner of the vehicle or the employee of the company that owns the vehicle must keep the keys securely with them.

- .2 At all times the director can limit the number and types of vehicles present in the establishment's enclosure.
- .3 Delivery personnel for material for the project are not required to obtain a security authorization, however they must remain close to their vehicle at all times during their stay in the establishment. The director can demand that they be accompanied by an employee of the establishment.
- .4 If the director allows for trailers to be left in the security perimeter of the establishment, the doors must remain securely locked at all times, as well as the windows when the trailer is unoccupied. The windows must be protected by a metallic mesh. All trailers used for storing material, inside as well as outside of the security perimeter, must remain securely locked at all times.

## **1.6 PARKING**

- .1 The director will identify the authorized parking areas for the construction worker's vehicles. Parking in non-designated areas is prohibited and vehicles will be towed.

## **1.7 DELIVERIES**

- .1 All delivery of material, equipment or tools for the project must be addressed to the contractor to clearly distinguish with deliveries meant for the establishment. The contractor must ensure that employees are present to receive the deliveries. The CSC personnel will not accept any deliveries of material, equipment or tools destined for the contractor.

## **1.8 TELEPHONES**

- .1 Installations of telephones, fax machines or computers connected to Internet are prohibited in the security perimeter with the authorization of the director.
- .2 The director will ensure that telephones, fax machines and computers with Internet access are not installed in areas accessible to inmates. Access to each computer will be protected by a password, prohibiting all access to internet by non-authorized personnel.
- .3 Except with authorization from the director, all cellular or wireless telephones, including but without limitation to messaging devices, pagers, Blackberries, telephones used as two-way radios, are prohibited in the establishment. If cellular phones are permitted the user must not allow the telephone to be used by inmates.
- .4 The director can permit but limit the use of two-way radios.

## **1.9 WORK HOURS**

- .1 The work week of the establishment is from Monday to Friday from 8 am to 4 h 30 pm.

- .2 Work is not permitted during the weekend or during public holidays with the authorization of the director, which must be requested a minimum of seven (7) days in advance. In the case of an emergency or other circumstance, the delay can be cancelled by the director.
- .3 Preparation work are done on normal work schedule. Replacement work are done on weekend.

#### **1.10 WORK OUTSIDE OF NORMAL WORK HOURS**

- .1 Permission from the director is required for all work carried out outside of the normal work hours. The contractor must advise at least 48 hours in advance when it is necessary to execute work outside of the normal work hours. If overtime is required for the execution of urgent work, the contractor must advise the director as soon as he is aware of the situation and follow the director's directives. The costs incurred by this situation can be charged to the contractor.
- .2 When work must be executed outside of normal work hours, or during the weekend or a public holiday and that the overtime is authorized by the director, the director or his representative can assign extra security personnel. The costs incurred by this situation can be charged to the contractor.

#### **1.11 TOOLS AND EQUIPMENT**

- .1 Keep, on site, a complete list of the tools and equipment that will be used during the project. This list must be available for inspection upon request.
- .2 Keep the aforementioned list updated during the course of the entire project
- .3 Never leave tools unattended, especially motorised tools, tools with cartridges, cartridges, files, saw blades, carbide saws, wires, cords, ladders and all other lifting equipment
- .4 Store tools and equipment in safe and approved locations.
- .5 Lock all tool boxes after use. The contractor's employees must keep the keys with the mat all times.
- .6 Fix and lock all non-installed scaffolding. Once installed, scaffolding must be securely fixed, to director's satisfaction.
- .7 Advise director immediately of the disappearance or loss of a tool or equipment
- .8 The director will ensure that the security personnel perform a check of the contractor's tools and equipment according to the list he provided:
  - .1 at the beginning and end of each project
  - .2 each week if the project lasts more than one week
- .9 Certain tools/equipment, such as cartridges and metal saw blades are rigorously controlled. The contractor will be given a sufficient quantity for the day's work at the beginning of the. Used blades/cartridges will be given to the representative at the end of each work day.

- .10 If propane or natural gas is used for heating during the project, it will be mandatory that an employee of the contractor supervise the construction site outside of regular work hours.

#### **1.12 KEYS**

- .1 Keys for detention hardware:
- .1 The contractor must make arrangements with the provider/installer of the detention hardware, so that the keys to said hardware are delivered directly to the establishment care of the Agent responsible of security equipment maintenance.
  - .2 The Agent will provide the contractor a receipt for the keys.
  - .3 The contractor will provide a copy of the receipt to the Ministerial representative.
- .2 Other keys
- .1 During the project the contractor will use construction barrels in the locks.
  - .2 The contractor will provide his employees and sub-contractors, if required, directives for the safe storage of construction keys.
  - .3 At the end of each phase of construction, the CSC representative, in collaboration with the lock manufacturer must:
    - .1 Establish a list of keys with their function.
    - .2 Receive keys and barrels for locks directly from the manufacturer.
    - .3 Remove and return construction barrels and install permanent barrels.

#### **1.13 DETENTION HARDWARE**

- .1 All existing detention hardware that has been removed must be given to the director so he may eliminate it or keep it in a safe location for reuse.

#### **1.14 PRESCRIPTION MEDICATION**

- .1 Contractors and construction workers are not authorized to smoke inside the establishment or outside in the establishment perimeter. They must not have any unauthorized tobacco products in their possession inside the establishment perimeter.
- .2 Contractors and construction workers found in violation of this directive will be asked to stop smoking and to throw out all unauthorized tobacco products. If they refuse to comply they will have to leave the site.
- .3 Smoking will be allowed outside the establishment perimeter, in an area designated by the director.

### **1.15 RESTRICTIONS ON TOBACCO USE**

- .1 Contractors and construction workers are not authorized to smoke inside the establishment or outside in the establishment perimeter. They must not have any unauthorized tobacco products in their possession inside the establishment perimeter.
- .2 Contractors and construction workers found in violation of this directive will be asked to stop smoking and to throw out all unauthorized tobacco products. If they refuse to comply they will have to leave the site.
- .3 Smoking will be allowed outside the establishment perimeter, in an area designated by the director.

### **1.16 PROHIBITED OBJECTS**

- .1 Weapons, ammunition, explosives, alcoholic beverages, drugs and narcotics are forbidden on the establishment's property.
- .2 The presence of prohibited objects on the construction site as well as the identity of the individual or individuals' responsible for their presence must be reported to the director immediately.
- .3 The contractor must be vigilant with their employees and the employees of sub-contractors since the discovery of a prohibited object can lead to the cancellation of the security authorization of the faulty employee.
- .4 If weapons or ammunition are found in the vehicle of a contractor, a sub-contractor, a supplier or one of their employees, the security authorization of the driver will be immediately revoked.

### **1.17 SEARCHES**

- .1 All persons and vehicles entering the establishment's property are subject to a search.
- .2 If the director has reason to believe that an employee of the contractor has contraband or prohibited objects in their possession, he can demand that the person be searched.
- .3 All personal effects of all employees arriving at establishment can be checked to detect the presence of illegal drug residue.

### **1.18 ACCESS TO THE ESTABLISHMENT**

- .1 Except with authorization from the director, construction workers and commercial vehicles will not be granted access to the establishment outside of normal work hours.

## **1.19 VEHICLE CIRCULATION**

- .1 Delivery vehicles can enter and exit the establishment, with escort, through the vehicle access gate during the following periods:
  - .1 from 8 am to 11 h 30 am
  - .2 from 1 pm to 3 h 30 pm

Construction vehicles cannot leave the site before an inmate count has been completed.
- .2 The contractor must advise twenty-four (24) hours in advance the arrival of heavy equipment such as cement trucks, cranes, etc.
- .3 Vehicles transporting dirt or debris, or all other vehicles which are considered impossible to search, must be supervised at all times by a CSC employee.
- .4 Before a commercial vehicle can be granted access to the establishment, the contractor or his representative must attest that the contents are necessary for the execution of the project.
- .5 Access to the CSC property will be refused to all vehicles whose contents may represent, in the director's opinion, a safety risk.
- .6 Personal vehicles of construction workers are not permitted in the security perimeter of the establishment for medium or maximum security facilities without authorization from the director.
- .7 With director authorization, a vehicle can be used to bring a group of employees to the construction site in the morning and depart at the end of the day. The vehicle cannot stay on site during the day.
- .8 With director authorization, certain equipment can be left at the construction site overnight or during the weekend. They must be locked and their batteries removed. The director can demand that they be attached with a chain and padlock to a fixed object.

## **1.20 CIRCULATION OF CONSTRUCTION WORKERS ON THE ESTABLISHMENT'S PROPERTY**

- .1 The director will leave as much liberty as possible to the contractor and his employees without compromising security.
- .2 However, the director can:
  - .1 deny or limit access to any part of the establishment
  - .2 demand, during the entire project or at certain times, that the construction workers be accompanied by a CSC security guard in certain areas.
- .3 All construction workers may only leave the construction site during breaks or lunch time. The break hours will be established by the contractor with director approval. The construction workers are not permitted to eat in the correctional agents break room or in the establishment lunchroom.

**1.21 SUPERVISION AND INSPECTION**

- .1 Construction activities and the movement of personnel and vehicles will be subject to supervision and inspection by CSC security personnel to ensure all safety regulations are followed.
- .2 The CSC personnel will ensure that the construction workers understand the necessity of the supervision and inspections, and that this understanding be maintained throughout the project.

**1.22 WORK INTERRUPTION**

- .1 At all times, the director can order the contractor, his employees, sub-contractors and their employees to not enter the construction site or leave the site immediately due to security reasons. The foreman must note the name of the CSC employee who gave the order, the time of the order and conform to the order as quickly as possible.
- .2 The contractor must inform the Ministerial representative of the situation in the twenty-four (24) hours following the work interruption.

**1.23 CONTACT WITH INMATES**

- .1 It is forbidden, without specific authorization, to engage with, talk to, give or receive objects from an inmate. Any individual found in violation of this rule will be immediately expelled from the construction site and have their security authorisation revoked.
- .2 Cameras are prohibited on the CSC property.
- .3 If the director allows the use of cameras, it is strictly forbidden to take pictures of inmates, of CSC employees or of all areas of the establishment which are not necessary for the project.

**1.24 PROJECT COMPLETION**

- .1 At the end of the project the contractor must remove all material, tools and equipment that are not designated as property of the establishment.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 01 33 00 Submittal procedures.

### **1.2 CONTENTS**

- .1 The contractor must manage activities in such a way that the health and safety of the public and construction site personnel as well as the protection of the environment always have priority on questions related to cost or work schedule.

### **1.3 REFERENCES**

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Canadian Standards Association (CSA International).
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .4 An Act Respecting Occupational Health and Safety, l.r.q. Chapter S-2.1, 2002 (updated January 1st 2012).
- .5 Construction work security code, S-2.1, r.6, 2001 (updated December 1st 2011).

### **1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with section 01 33 00 – Submittal Procedures
- .2 Submit to the CSST Ministerial representative the prevention program specific to the construction site as described in article 1.9, at least 10 days before work begins. The contractor must update the prevention program if the course of work differs from the initial plan. The Ministerial representative can, at any time following the reception of the program, demand that the program be modified or completed to better reflect the construction site realities. The contractor must make the required corrections before starting the work.
- .3 Submit to the Ministerial representative, in the following 24 hours, a copy of all inspection reports, correction notices or recommendations issued by federal or provincial inspectors.
- .4 Submit to the Ministerial representative, in the following 24 hours, a copy of all investigation reports for all accidents leading to injury and for all accidents that bring to light a potential risk.
- .5 Submit to the Ministerial representative, all material safety data sheets for controlled materials used at the construction site at least 3 days before they are used on site.



- .6 Submit to the Ministerial representative copies of training certificates required for the application of the prevention program, in particular:
  - .1 Course for Health and security on construction sites
  - .2 Security agent attestation
  - .3 Workplace first aid and CPR training
  - .4 Work that may produce asbestos dust
  - .5 Work in confined spaces
  - .6 Lockout procedures
  - .7 Wearing and adjustment of Personal protective clothing and equipment
  - .8 Safety when operating a Forklift
  - .9 Lifting platforms
  - .10 All other training required by regulation or by the prevention program
- .7 Medical exams: When medical exams are required, under law, regulation, directive, by a specification or a prevention program, the contractor must:
  - .1 Before mobilisation, submit to the Ministerial representative the attestations for all medical exams for all his employees that will be present at the construction site opening.
  - .2 Submit without delay, all attestations for all medical exams of new employees arriving on the site.
- .8 Emergency plan: the emergency plan, as described in article 1.9.3, must be submitted to the Ministerial representative at the same time as the prevention program.
- .9 Notice of construction site opening: the notice for the construction site opening must be submitted to the CSST before work begins with a copy to the Ministerial representative. A copy of the notice must also be clearly posted at the construction site. Upon demobilization the notice of closing must be sent to the CSST with a copy to the Ministerial representative.
- .10 Engineer drawings and conformity certificates: the contractor must submit to the CSST and Ministerial representative a copy of all drawings and conformity certificates, signed and sealed by an engineer, that are required by the « Code de sécurité pour les travaux de construction (S-2.1, r. 6) », another law, another regulation, another clause of the specification or contract. A copy of these documents must be available at all times at the construction site.
- .11 Conformity certificate delivered by the CSST: the conformity certificate is a document delivered by the CSST that confirms that the contractor complies with the CSST, in other words, the contractor has paid all amounts due relative to a certain contract. This document must be submitted to the Ministerial representative at the end of the project.

## **1.5 SAFETY ASSESSMENT**

- .1 The contractor must identify the dangers associated to each task that will be carried out at the construction site.
- .2 The contractor must plan and organize the work to eliminate sources of danger or to favour collective protection and therefore minimize the need for personal protective clothing and equipment. If personal protective equipment is required to prevent falls the workers must use a harness in compliance with the CAN/CSA-A-259, 10-M90 standard. A safety belt cannot be used as a protection against falls.
- .3 An equipment, tool or means of protection that cannot be used or installed without compromising public or worker security is deemed inadequate for the work to be carried out.
- .4 All mechanical equipment must be inspected before delivery to the construction site. Before using mechanical equipment, the contractor must submit to the Ministerial representative, a conformity certificate signed by a competent mechanic. The Ministerial representative can, at all times, if he suspects a defect or risk of accident, order that the equipment be stopped and demand a second inspection by a specialist of his choosing.

## **1.6 MEETINGS**

- .1 The contractor must have a representative with decision making powers present at all meetings where the matter of health and safety on the construction site is discussed.

## **1.7 REGULATORY REQUIREMENTS**

- .1 Comply with all laws, rules regulations and standards that are applicable to the work being carried out.
- .2 Comply with standards and regulations to guaranty the normal course of work on sites contaminated with toxic or dangerous materials.
- .3 Always use the latest versions of applicable standards.

## **1.8 PROJECT / SITE CONDITIONS**

- .1 On this construction site the contractor must take into account the following particularities:
  - .1 Safety fences with barbed wire;
  - .2 Safety fences connected to a detection system.

## **1.9 HEALTH AND SAFETY MANAGEMENT**

- .1 Accept and take responsibility for all tasks and obligations normally given to the contractor according to the Law on work health and safety (L.R.Q., chapter S-2.1) and the « Code de sécurité pour les travaux de construction (S-2.1, r.6) ».

- .2 Prepare a prevention program specific to the construction site that is based on the identification of risks and put the program into application from the beginning of the project until the last step of demobilization. The prevention program must take into account the information in article 1.7. It must be submitted to all persons concerned, as directed in article 1.2. The prevention program should include at minimum:
  - .1 The company policy on health and safety.
  - .2 The description of the work to be executed, the total cost, the schedule and manpower curves.
  - .3 Health and safety organisation chart.
  - .4 Physical and material organisation of the construction site.
  - .5 First aid standards.
  - .6 Identification of risks related to the construction site.
  - .7 Identification of risks related to the tasks that will be carried out including prevention measures and methods of application.
  - .8 Required training.
  - .9 Procedures in case of accidents/injuries.
  - .10 Written consent that all persons will respect the prevention program.
  - .11 A schedule of inspection items based on the preventative measures.
- .3 The contractor must prepare an emergency plan in relation with the characteristics and restrictions of the site and its environment. The emergency plan must be submitted to all persons concerned as described in article 1.2. The emergency plan must include:
  - .1 An evacuation procedure.
  - .2 Identification of resources (police, fire department, ambulance, etc.).
  - .3 Identification of the resource people onsite.
  - .4 Identification on first aid providers.
  - .5 Training required for the people in charge of the application of the plan.
  - .6 All other information that is required given the site's characteristics.

#### **1.10 RESPONSIBILITIES**

- .1 Independent of construction site size or number of employees present, a person must be named as supervisor and responsible of health and safety. Take all necessary precautions to assure the health and safety of people on or near the construction site that could be affected by the work being carried out.
- .2 Take all necessary measures to ensure the application and respect of the health and safety requirements in the contractual documents, federal and provincial regulations, the standards applicable to the prevention program specific to the construction site and comply without delay to all orders or notices of correction issued by the CSST.
- .3 Take all necessary measures to keep the construction site clean and orderly throughout the project.

### **1.11 COMMUNICATION AND POSTINGS**

- .1 Take all necessary measure to ensure effective communication of all information regarding health and safety on the construction site. Upon arrival at the construction site all workers must be informed of the particularities of the prevention program, of their obligations and their rights. The contractor must insist on the right for a worker to refuse to execute a task if they believe that it may compromise their health, their safety, their security, their physical integrity or that of other people present on the construction site. The contractor must keep an updated register of given information with the signature of all the workers having received the information.
- .2 The following information and documents must be posted in a space easily accessible to the workers:
  - .1 Notice of construction site opening.
  - .2 Identification of the general contractor.
  - .3 Company health and safety policy.
  - .4 Prevention program specific to the construction site.
  - .5 Emergency plan.
  - .6 Safety data sheets for controlled materials used at the construction site.
  - .7 Minutes of the construction site meetings.
  - .8 Names of the first aid providers.
  - .9 Intervention or correction reports issued by the CSST.

### **1.12 UNFORESEEN HAZARDS**

- .1 In the case where a source of danger, not identified in the specification or not identifiable during the preliminary inspection of the site, arises during the course of the project, the contractor must stop work immediately, put in place temporary security measures for the public and the workers and inform the Ministerial representative verbally and in writing. The contractor must make the necessary modifications to the prevention program so that work may restart in a safe environment.

### **1.13 NAIL GUNS AND OTHER DEVICES WITH CARTRIDGES**

- .1 Nail guns and all other devices with cartridges are prohibited on CSC property. Refer to section 01 35 13 – PROJECT PROCEDURES RELATIVE TO SECURITY REQUIREMENTS OF CORRECTIONAL SERVICES CANADA.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 26 28 16.01 Air circuit breakers

### **1.2 REFERENCES**

- .1 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-1994, Stipulated Price Contract.

### **1.3 INSPECTION**

- .1 Allow Ministerial Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress. Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Ministerial Representative instructions, or law of Place of Work.
- .2 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .3 Ministerial Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Ministerial Representative shall pay cost of examination and replacement.

### **1.4 PROCEDURES**

- .1 Notify Ministerial Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

### **1.5 REJECTED WORK**

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Ministerial Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.

- .3 If in opinion of Ministerial Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Ministerial Representative.

## **1.6 REPORTS**

- .1 Submit one (1) paper copy and one (1) electronic copy of inspection and test reports to Ministerial Representative.

## **1.7 EQUIPMENT AND SYSTEMS**

- .1 Submit adjustment and balancing reports for mechanical and electrical systems.  
.2 Refer to Section 26 28 16.01, Air circuit breakers, for definitive requirements.

## **PART 2 PRODUCTS**

### **2.1 NOT USED**

- .1 Not Used.

## **PART 3 EXECUTION**

### **3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 01 33 00 Submittal Procedures

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit written request in advance of cutting or alteration which affects:
  - .1 Structural integrity of elements of project.
  - .2 Integrity of weather-exposed or moisture-resistant elements.
  - .3 Efficiency, maintenance, or safety of operational elements.
  - .4 Visual qualities of sight-exposed elements.
  - .5 Work of Owner or separate contractor.
- .3 Include in request:
  - .1 Identification of project.
  - .2 Location and description of affected Work.
  - .3 Statement on necessity for cutting or alteration.
  - .4 Description of proposed Work, and products to be used.
  - .5 Alternatives to cutting and patching.
  - .6 Effect on Work of Owner or separate contractor.
  - .7 Written permission of affected separate contractor.
  - .8 Date and time work will be executed.

**1.3 MATERIALS**

- .1 Required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

**1.4 PREPARATION**

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

## **1.5 EXECUTION**

- .1 Execute cutting, fitting and patching to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .7 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .9 Restore work with new products in accordance with requirements of Contract Documents.
- .10 Fit Work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .11 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material.
- .12 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

## **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse recycling.



**PART 2 PRODUCTS**

**2.1 NOT USED**

.1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

.1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 REFERENCES**

- .1 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-94, Stipulated Price Contract.
- .2 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions "C", In Effect as Of: May 14, 2004.

**1.2 PROJECT CLEANLINESS**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Ministerial Representative.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site containers (if required) for collection of waste materials and debris.
- .5 Provide and use marked separate bins for recycling.
- .6 Dispose of waste materials and debris off site.
- .7 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

### **1.3 FINAL CLEANING**

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove all waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove all waste products and debris.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Ministerial Representative.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls and floors.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .12 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .13 Remove dirt and other disfiguration from exterior surfaces.
- .14 Sweep and wash clean paved areas.
- .15 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

### **1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse recycling.

**PART 2 PRODUCTS**

**2.1 NOT USED**

.1 Not Used.

**PART 3 EXECUTION**

**3.1 NOT USED**

.1 Not Used.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 OBJECT**

- .1 Cable connection and electrical boxes, connection material and installation.

**1.2 REFERENCES**

- .1 CSA International
- .1 CAN/CSA-C22.2 No.18-98(R2003), Outlet Boxes, Conduit Boxes and Fittings.
  - .2 CAN/CSA-C22.2 No.65-03(R2008), Wire Connectors.
- .2 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)
- .1 EEMAC 1Y-2-1961, Bushing Stud Connectors and Aluminum Adapters (1200 Ampere Maximum Rating).
- .3 National Electrical Manufacturers Association (NEMA).

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Pressure type wire connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper or aluminum alloy sized to fit conductors as required.
- .2 Fixture type splicing connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit conductors 10 AWG or less.
- .3 Bushing stud connectors: to EEMAC 1Y-2 and NEMA to consist of:
- .1 Connector body and stud clamp for stranded copper or aluminum conductors.
  - .2 Clamp for stranded copper conductors.
  - .3 Clamp for stranded aluminum conductors.
  - .4 Stud clamp bolts.
  - .5 Bolts for copper bar.
  - .6 Sized for conductors as indicated.
- .4 Clamps or connectors for armoured cable, aluminum sheathed cable, flexible conduit, non-metallic sheathed cable as required to CAN/CSA-C22.2 No.18.

**PART 3 EXECUTION**

**3.1 INSTALLATION**

- .1 Remove insulation carefully from ends of conductors and:
  - .1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.
  - .2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No.65.
  - .3 Install fixture type connectors and tighten. Replace insulating cap.
  - .4 Install bushing stud connectors in accordance with EEMAC 1Y-2.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 20 Wire And Box Connectors, 0-1000 V.

### **1.2 REFERENCES**

- .1 CSA C22.2 no 0.3-92,. Test Methods for Electrical Wires and Cables
- .2 CAN/CSA-C22.2 no 131-m89(C1994), Type TECK 90 Cable

## **PART 2 PRODUCTS**

### **2.1 BUILDING WIRES**

- .1 Conductors: stranded for 10 AWG and larger.
- .2 Minimum size: 12 AWG.
- .3 Copper conductors: size as indicated, with 600 V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE.
- .4 Aluminum alloy (NUAL) cable are allowed for conductors of 60 A and more.

### **2.2 TECK CABLE**

- .1 Cable: in accordance with CAN/CSA-C22.2 no 131.
- .2 Conductors:
  - .1 Grounding conductor: copper.
  - .2 Circuit conductors: copper, size as indicated.
  - .3 Aluminum alloy (NUAL) conductors are allowed for conductors of 60 A and more
- .3 Insulation:
  - .1 Cross-linked polyethylene XLPE, Rated for 600 V.
- .4 Inner jacket: polyvinyl chloride material.
- .5 Armour: interlocking aluminum.
- .6 Overall covering: thermoplastic polyvinyl chloride.

- .7 Fastenings:
  - .1 One hole malleable iron, steel, aluminum or zinc straps to secure surface cables 50 mm and smaller. Two hole steel straps for cables larger than 50 mm.
  - .2 Channel type supports for two or more cables at 1500 mm centers.
  - .3 Threaded rods: 6 mm diameter to support suspended channels.
- .8 Connectors:
  - .1 Watertight, approved for TECK cable.

### **2.3 ARMOURED CABLES**

- .1 Conductors: insulated, copper, size as indicated.
- .2 Type: AC90.
- .3 Armour: interlocking type fabricated from aluminum strip.
- .4 Type: ACWU90, PVC flame retardant jacket over thermoplastic armour and compliant to applicable Building Code classification for this project.

### **2.4 CONTROL CABLES**

- .1 Type: LVT: 2 soft annealed copper conductors, sized as indicated, Insulation with thermoplastic and sheath with thermoplastic jacket.
- .2 Type: low energy 300 V control cable: stranded annealed copper conductors sized as indicated, Insulated with PVC type TW, TW 40 degrees C, TWH, polyethylene with Shielding as indicated

### **2.5 WIRING IDENTIFICATION**

- .1 Identify with numbering at each end command wire with permanent ink on a plastic band.



## **PART 3 EXECUTION**

### **3.1 INSTALLATION OF BUILDING WIRES**

- .1 Low-voltage wiring (0 to 750 volts): Generally, all electrical distribution services and services for auxiliary systems shall be carried out with wiring installed in thin-wall metallic conduits (EMT) in conformity with Section 16111. Generally, all cables and wire shall be routed through the ceiling of corridors to be installed perpendicularly in the various spaces. Armored cable AC90 (BX) may be used within spaces, in suspended ceilings, and dry walls if the length does not exceed 3 m.
- .2 For 60A or less, only cooper wiring is accepted for 600V or less.
- .3 For 60A or more, NUAL type wiring is accepted if the electrical code is respected or manufacturer recommendations are followed. (piping dimension are the responsibility of the electrician).
- .4 All wiring must be phase color coded for the entire building.
- .5 If color coded wire are not available, each wire must be identified by the same number at each end.
- .6 For non-ventilated motor with H or F insolation class, wire insolation must be degC for a minimum of 1300mm in all direction from the motor.
- .7 Neutral wire must be white color coded and clearly identified. The wire must be continuous, without fuse, switch or other circuit opening device.
- .8 Principal conductors wires must have the at both end the same color code: red, black and blue for phases A, B and C.
- .9 Do not pull spliced cables through conduits.
- .10 Install all cables routed through the same conduit at the same time.
- .11 Use lubricants meeting ACNOR standards and that are compatible with the cable sheath material to reduce pull strain.
- .12 The sizes on the drawings are for the guidance of the Contractor. They have been selected to yield a maximum voltage drop of 3% based on probable routing. The Contractor shall ensure that the final routing ensures that these conditions are complied with.
- .13 Cables installed in technical pit must be adequately fastened to the building's structure at a maximum spacing of 1 m.

### **3.2 INSTALLATION OF TECK90 CABLE (0 -1000 V)**

- .1 Group cables wherever possible on U channels with proper anchoring.
- .2 Terminate cable in accordance with section 26 05 20 Wire And Box Connectors, 0-1000 V.

### **3.3 INSTALLATION OF ARMOURED CABLES**

- .1 Group cables wherever possible following building axes.
- .2 Support cables correctly. No cable should hang on suspended ceiling.
- .3 Terminate cable in accordance with section 26 05 20 Wire And Box Connectors, 0-1000 V.

### **3.4 INSTALLATION OF CONTROL CABLES**

- .1 Install control cables in conduit, cable troughs.
- .2 Ground control cable shield.

### **3.5 INSTALLATION OF NON-METALLIC SHEATHED CABLE**

- .1 Install cables.
- .2 Install straps and box connectors to cables as required.

### **3.6 INSTALLATION OF CONNECTORS**

- .1 Install compression connectors for lampposts and outdoor equipment, and tighten with an appropriate crimping tool in conformity with the Manufacturer's recommendations. Cover the compression with insulation and a minimum of three wraps of Super 88 insulation tape. Position the connection vertically. Installations must meet safety testing performed in conformity with CSA C22.2.
- .2 Install and compress splicing connectors for lighting equipment and other interior connections. Install the insulating cap.
- .3 Install screw compression device for interior equipment subject to vibration

### **3.7 ESSAIS**

- .1 General
  - .1 Perform all testing required.
  - .2 Test electrical continuity of all circuits, ensure there are no short-circuits or ground leaks.
  - .3 Determine if all electrical connections have been correctly made.

**ANNEX 1**

| <b>MAXIMUM NUMBER OF RW-90 WIRES IN A CONDUIT</b> |                    |     |     |     |     |    |
|---|--------------------|-----|-----|-----|-----|----|
| Wire size AWG                                     | Conduit size in mm |     |     |     |     |    |
|   | 16                 | 21  | 27  | 35  | 41  | 53 |
| 14  | 7                  | 14  | 22  | 40  | 55  | 90 |
| 12  | 4                  | 10  | 16  | 30  | 40  | 66 |
| 10  | 4                  | 6   | 12  | 20  | 30  | 50 |
| 8   | ---                | 3   | 6   | 10  | 16  | 26 |
| 6   | ---                | --- | 3   | 8   | 9   | 18 |
| 4   | ---                | --- | --- | 3   | 6   | 12 |
| 3   | ---                | --- | --- | 3   | 6   | 12 |
| 2   | ---                | --- | --- | --- | 6   | 9  |
| 1   | ---                | --- | --- | --- | 4   | 6  |
| 1/0   | ---                | --- | --- | --- | --- | 6  |

Note:

For not shown size, use chapter V – Electricity of Quebec Construction Code (Quebec Electrical Code).

**ANNEX 2**

| <b>MAXIMUM LENGTH (IN METER) OF A 120 V CIRCUIT vs VOLTAGE DROP</b> |   |       |       |       |       |
|---|---|-------|-------|-------|-------|
| Wire size AWG   | Maximum circuit load in Volt-Amperes (VA) |       |       |       |       |
|   | Up to 960                                 | 1 200 | 1 920 | 1 440 | 2 880 |
| 12  | 36  | 29    | 18    | 23    | ---   |
| 10  | 58  | 46    | 29    | 37    | 18    |
| 8   | 92  | 74    | 46    | 59    | 30    |
| 6   | 147                                       | 117   | 73    | 94    | 47    |

Notes:

For load not shown, use chapter V – Electricity of Quebec Construction Code (Quebec Electrical Code) (D3 table).

Length calculated for cooper wires at 60 °C.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 01 33 00 Submittal Procedures.

### **1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA C22.2 No. 18-98(R2003), Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.
  - .2 CSA C22.2 No. 45-M1981(R2003), Rigid Metal Conduit.
  - .3 CSA C22.2 No. 56-04, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
  - .4 CSA C22.2 No. 83-M1985(R2003), Electrical Metallic Tubing.
  - .5 CSA C22.2 No. 211.2-M1984(R2003), Rigid PVC (Unplasticized) Conduit.
  - .6 CAN/CSA C22.2 No. 227.3-05, Nonmetallic Mechanical Protection Tubing (NMPT), A National Standard of Canada (February 2006).
  - .7 CSA C22.10-10, Construction code of Quebec, chapter V – Electricity

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data: submit manufacturer's printed product literature, specifications and datasheets.
  - .1 Submit cable manufacturing data.
- .3 Quality assurance submittals:
  - .1 Test reports: submit certified test reports.
  - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .3 Instructions: submit manufacturer's installation instructions.

### **1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse recycling.

## **PART 2 PRODUCTS**

### **2.1 CONDUITS**

- .1 Electrical metallic tubing (EMT): to CSA C22.2 no. 83, with couplings.

### **2.2 CONDUIT FASTENINGS**

- .1 One hole steel straps to secure surface conduits 50 mm and smaller. Two hole steel straps for conduits larger than 50 mm.
- .2 Beam clamps to secure conduits to exposed steel work.
- .3 Threaded rods, 6 mm diameter, to support suspended channels.

### **2.3 CONDUIT FITTINGS**

- .1 Fittings: in accordance to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified. Coating: same as conduit.
- .2 Ensure factory "ells" where 90 degrees bends for 25 mm and larger conduits.
- .3 Watertight connectors and couplings for EMT.
  - .1 Set-screws are not acceptable.

### **2.4 FISH CORD**

- .1 Polypropylene.

## **PART 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

### **3.2 INSTALLATION**

- .1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
- .2 Use electrical metallic tubing (EMT) above 2.4 m not subject to mechanical injury.
- .3 Minimum conduit size for lighting and power circuits: 19 mm.

- .4 Mechanically bend steel conduit over 19 mm diameter.
- .5 Install fish cord in empty conduits.
- .6 Dry conduits out before installing wire.

### **3.3 SURFACE CONDUITS**

- .1 Run parallel or perpendicular to building lines.
- .2 Locate conduits behind infrared or gas fired heaters with 1.5 m clearance.
- .3 Run conduits in flanged portion of structural steel.
- .4 Group conduits wherever possible on suspended channels.
- .5 Do not pass conduits through structural members except as indicated.
- .6 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

### **3.4 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 01 33 00 Submittal Procedures.
- .2 Section 01 74 11 Cleaning.

**1.2 REFERENCES**

- .1 CSA International
  - .1 CSA C22.2 No.31-10, Switchgear Assemblies.
- .2 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)
  - .1 EEMAC G8-3.3-89, Metal Enclosed Interrupter Switchgear Assemblies.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for low voltage switchgear and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed by OIQ.
  - .2 Indicate on drawings:
    - .1 Floor anchoring method and foundation template.
    - .2 Dimensioned cable entry and exit locations.
    - .3 Dimensioned position and size of bus.
    - .4 Overall length, height and depth of complete switchgear.
    - .5 Dimensioned layout of internal and front panel mounted components.
- .4 Certificates:
  - .1 Submit certified factory test results.
  - .2 Submit certified field test results.

#### **1.4 CLOSEOUT SUBMITTALS**

- .1 Operation and Maintenance Data: submit operation and maintenance data for low voltage switchgear and components for incorporation into manual.

#### **1.5 WARRANTY**

- .1 Provide a valid manufacturer's warranty for a period of 18 month after delivery or 12 month after start up whichever comes first.

#### **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and Handling Requirements:
  - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations, in a clean and dry, well-ventilated area.
  - .2 Store and protect low voltage switchgear from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .3 Packaging Waste Management: remove packaging materials and dispose of them in the location designated by the representative of the institution.

### **PART 2 PRODUCTS**

#### **2.1 MATERIALS**

- .1 Switchgear assembly must be built in accordance to CSA C22.2 No.31 and EEMAC G8-2. Switchgear must be SIMENS FC II or approved equivalent.

#### **2.2 RATING**

- .1 Secondary switchgear: 600 V, 4000 A, 3 phases, 4 wire, 60 Hz, minimum short circuit capacity 65000 A (rms symmetrical).

#### **2.3 ENCLOSURE**

- .1 Switchgear must be built in gray ASA 61color and in a EEMAC 1 type casing.
- .2 Switchgear must be built of vertical section bolted together to form a rigid assembly. Sides, top and back must be covered with bolted removable steel plates of proper caliber.



- .3 Each section must have name plate in steel with:
  - .1 Manufacturer's name
  - .2 System's voltage
  - .3 Rated ampere
  - .4 Type
  - .5 Manufacturer's PO # and date
- .4 Each section must have CSA marking and sticker showing short-circuit rating.
- .5 Main incoming section must have 4000A rating and include 3 sections:
  - .1 One section with:
    - .1 Main air circuit breaker, 4000A type Siemens WL, draw out with calibration sheet of 3200A and Hydro-Quebec measuring compartment.
  - .2 One section with:
    - .1 Four (4) 2000A. Air circuit breaker type Siemens WL, draw out calibrated with value as shown on line drawing.
  - .3 One section with:
    - .1 Moulded case circuit breaker with amperage value as shown on line drawing

## **2.4 BUSBARS**

- .1 Bus bars must be in copper and of sufficient size to limit temperature below 65 °C. They must be built to be able to support a 65000A short circuit current.
- .2 Allow for extension of bus on both sides of unit without need for further drilling or preparation in field.
- .3 Joints in bars must be secured with non-corrosive grade 5 bolts.

## **2.5 GROUNDING**

- .1 Copper ground bus not smaller than 50 mm x 6 mm extending full width of multi-cubicle switchboard and situated at bottom.
- .2 Lugs at each end for size 4/0 AWG grounding cable.

## **2.6 AIR CIRCUIT BREAKER**

- .1 See section 26 28 16.01 "Air circuit breakers".

## **2.7 MOULDED CASE CIRCUIT BREAKERS**

- .1 Moulded case circuit breakers must have a current rating as shown on the line diagram. As Siemens Sentron series or approved equivalent.

## **2.8 INSTRUMENTS**

- .1 Client measuring unit must include a computer as Siemens PAC 3200 with all required accessories (CT's, PT's, etc.) and have at least the following characteristics:
  - .1 Mudbus TCP communication interface
  - .2 Mudbus to BACNET converter
  - .3 LCD display
  - .4 Voltage reading (including min/max)
  - .5 Amperage reading (including min/max)
  - .6 Watts reading
  - .7 VA Reading
  - .8 total harmonic distortion reading
  - .9 Power factor
  - .10 Energy consumption meter

## **2.9 INSTRUMENT TRANSFORMERS**

- .1 PT's: CAN3-C13, dry type, indoor.
- .2 PT's with separated fuse holder.
- .3 CT'S: Can3-C13-M86, Dry type, indoor.

## **2.10 POWER SUPPLY AUTHORITY METERING**

- .1 Arrange with authority having jurisdiction for supply of mounting accessories and wiring for metering as follows:
  - .1 Use existing equipment.

## **2.11 FINISHES**

- .1 Apply finishes.
  - .1 Cubicle exteriors gray.
  - .2 Cubicle interiors gray.

## **2.12 EQUIPMENT IDENTIFICATION**

- .1 Nameplates:
  - .1 25 x 100 mm, 3 lines, 6 mm high letter.
  - .2 Complete switchgear labelled: voltage, system configuration and main bus ampacity.
  - .3 Main cubicle labelled: "Main Breaker".
  - .4 Distribution units labelled: "Load description and ampacity".

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for low voltage switchgear installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative and Consultant.
  - .2 Inform Departmental Representative and Consultant of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative and Consultant.

### **3.2 INSTALLATION**

- .1 Locate switchgear assembly as indicated and bolt to floor.
- .2 Connect main secondary power supply to main bus.
- .3 Connect load side of breakers in distribution cubicles to distribution feeders.
- .4 Check factory made connections for mechanical security and electrical continuity.
- .5 Run one grounding conductor 4/0 AWG bare copper in 25 mm conduit from ground bus to ground.
- .6 Check trip unit settings against co-ordination study to ensure proper working and protection of components.

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

- .3 Waste Management: separate waste materials for disposal in accordance with SCC representative.

### **3.4 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by low voltage switchgear installation.

### **3.5 START-UP**

- .1 Start-up must be done by a qualified manufacturer's technician or approved by manufacturer.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 Section 01 33 00 Submittal Procedures.
- .2 Section 01 74 11 Cleaning.
- .3 Section 26 23 00 Low voltage switchgear.

**1.2 REFERENCES**

- .1 American National Standards Institute /Institute of Electrical and Electronics Engineers (ANSI/IEEE)
  - .1 ANSI/IEEE C37.13-2008, Low Voltage AC Power Circuit Breakers Used in Enclosures.
- .2 CSA International
  - .1 CSA C22.2 No. 5-09, Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, and NMX-J-266-ANCE-2010).

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for circuit breakers and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec.
    - .1 Indicate on drawings:
      - .1 Time-current phase protection co-ordination characteristic curves for breakers.

**1.4 CLOSEOUT SUBMITTALS**

- .1 Operation and Maintenance Data: submit operation and maintenance data for circuit breakers for incorporation into manual.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect circuit breakers from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **PART 2 PRODUCTS**

### **2.1 AIR CIRCUIT BREAKER**

- .1 Power circuit breaker must be type Siemens WL or approved equivalent.
- .2 Power circuit breaker must be low voltage draw out type with ampacity as shown on line diagram and in accordance with UL 489.
- .3 Circuit breaker must have a solid state trip unit that include the following protections:
  - .1 Long delay (L)
  - .2 Short delay (S)
  - .3 Instantaneous (I)
  - .4 Ground fault (G)
- .4 Trip unit must be compatible with all circuit breaker available ampacity of the breaker (800A to 5000A).
- .5 Circuit breaker must include at least these functions:
  - .1 Open button.
  - .2 Close button.
  - .3 120V a.c. closing coil
  - .4 120V a.c. opening coil
  - .5 120V a.c reloads spring motor.
  - .6 Lockable reloads spring lever.
  - .7 Load of spring indicator.
  - .8 Status indicator (Open/Close).

- .9 Ready to close indicator signifying that all conditions are met to close the breaker (load of the spring, interlock, etc...).
- .10 Handle on circuit breaker to put the breaker in position in/test/out.
- .6 In addition, the Main Breaker must have a measuring module that includes the following feature:
  - .1 Phase lost protection.
  - .7 Current sensors of the breaker must be of Rogowski type.
  - .8 Breaker conception must allow on site addition of modules like "Shunt trip", Closing coil, reload coil, etc.
  - .9 Trip unit must be ETU745 type and include a LCD display.
  - .10 Trip unit must allow on site addition of input/output modules, zone selected interlock (ZSI) without having to draw out the breaker.

## **2.2 OPTIONAL FEATURES**

- .1 Supply, install and connect a steel NEMA 12 box, painted grey, with locking mechanism, to receive the pushbuttons and lights for the remote operation of the circuit breakers. Minimum box dimensions 406mm (W) x 406 mm (H) x 152 mm (D), wall mount with simple door. Install according to placement shown on drawing E-01.
- .2 Supply, install and connect the pushbuttons and lights, industrial grade 22.5 mm Ø. For each circuit breaker, supply one (1) red pushbutton (open), one (1) green pushbutton (close), one (1) red light (opened) and one (1) green light (closed). Installation according to detail on drawing E-01. Leave minimum 80 mm vertical spacing (center-center) between the pushbuttons and/or the lights. Leave minimum 12.5 mm spacing between the edge of the panel and the pushbuttons and/or lights. Identify with lamicoid nameplates the function of each pushbutton (open or close), the light (circuit breaker state: opened or closed) and the name of the circuit breaker operated as shown in the detail on drawing E-01.

## **2.3 SETTINGS**

- .1 Calibrate new circuit breakers to obtain TCC curves as similar as possible to TCC curves of existing circuit breakers.
- .2 Ensure coordination between protective devices.
- .3 Coordinate with Hydro-Quebec to produce a coordination study if required.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for air circuit breakers installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Ministerial Representative.
  - .2 Inform Ministerial Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of approval to proceed from Ministerial Representative.
- .2 Install circuit breaker as Manufacturer Recommendations.

**3.2 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**