



INVITATION TO TENDER

FOR

SHORT CIRCUIT CORRECTION

Building 20

Project: CEF14-0025

CENTRAL EXPERIMENTAL FARM (CEF)

Agriculture and Agri-Food Canada (AAFC)

K.W. Neatby Building

960 Carling Avenue

Ottawa, Ontario K1A 0C6

SOLICITATION 14-1264

**CLOSING: Monday December 15, 2014 at 02:00 p.m.
Eastern Standard Time (EST)**

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SPECIAL INSTRUCTIONS TO BIDDERS

SI01 BID DOCUMENTS

- 1) The following are the bid documents:
 - (a) Special Instructions to Bidders;
 - (b) Instructions to Bidders;
 - (c) General Conditions for Minor Works;
 - (d) Insurance Terms;
 - (e) Drawings and Specifications;
 - (f) Bid and Acceptance Form and related Appendix(s); and
 - (g) Any amendment issued prior to solicitation closing.

Canada reserves the right to revise or amend the Bid Documents prior to the date set for opening bids. Such revisions or amendments, if any, will be announced by an addendum or addenda to the documents.

Submission of a bid constitutes acknowledgement that the Bidder has read and agrees to be bound by these documents.

SI02 ENQUIRIES DURING THE SOLICITATION PERIOD

- 1) Enquiries regarding this bid must be submitted in writing to the Contracting Officer. The Contracting Officer for the purpose of this bid is:

Jean-Pierre Simard
Senior Contracts Officer
Agriculture and Agri-Food Canada
K.W. Neatby Building, Room 1127
960 Carling Avenue
Ottawa, Ontario K1A 0C6
613-759-6157
Jean-pierre.simard@agr.gc.ca

- 2) Except for the approval of alternative materials as described in IB14 of the INSTRUCTIONS TO BIDDERS, enquiries should be received no later than five (5) calendar days prior to the date set for solicitation closing to allow sufficient time to provide a response. Enquiries received after that time may not result in an answer being provided.
- 3) To ensure consistency and quality of the information provided to Bidders, the Contracting Officer shall examine the content of the enquiry and shall decide whether or not to issue an amendment.
- 4) All enquiries and other communications related to this bid sent throughout the solicitation period are to be directed ONLY to the Contracting Officer. Non-compliance with this requirement during the solicitation period can, for that reason alone, result in disqualification of a bid.

SI03 MANDATORY SITE VISIT

- 1) It is mandatory that the Bidder or a representative of the Bidder visit the work site. Arrangements have been made for the site visit to be held at the CEF Ottawa, **K.W. Neatby building, 960 Carling Avenue**, Ottawa on **Thursday December 4, 2014**. The site visit will begin at **10:00 a.m. EST**. Bidders will be required to sign an attendance sheet. Bidders should confirm in their bid that they have attended the site visit. Bidders who do not attend the mandatory site visit or do not send a representative will not be given an alternative appointment and their bid will be declared non-responsive. Any clarifications or changes to the bid solicitation resulting from the site visit will be included as an amendment to the bid solicitation

SI04 REVISION OF BID

- 1) A bid may be revised by letter in accordance with IB10 of the INSTRUCTIONS TO BIDDERS.

SI05 BID RESULTS

- 1) Following solicitation closing, bidders may ask the results of the bid opening by calling the CEF at Telephone No. (613) 759-6157.

SI06 BID VALIDITY PERIOD

- 1) Canada reserves the right to seek an extension to the bid validity period prescribed in Clause 4 of the BID AND ACCEPTANCE FORM. Upon notification in writing from Canada, Bidders shall have the option to either accept or reject the proposed extension.

SI07 CONSTRUCTION DOCUMENTS

- 1) The successful contractor will be provided with one paper copy of the sealed and signed drawings, the specifications and the amendments upon acceptance of the offer. Additional copies, up to a maximum of (1), will be provided free of charge upon request by the Contractor. Obtaining more copies shall be the responsibility of the Contractor including costs.

SI08 PERSONNEL SECURITY REQUIREMENTS

- 1) The Successful Bidder's personnel, as well as any subcontractor and its personnel, who are required to perform any part of the work pursuant to the subsequent contract must meet the following contract security requirements: RELIABILITY STATUS REQUIRED

Personnel who are required to perform any part of the work must EACH hold a valid personnel security screening at the level of RELIABILITY STATUS, granted or approved by Agriculture and Agri-Food Canada. Until the security screening of the personnel has been completed satisfactorily by Agriculture and Agri-Food Canada, the Contractor/Subcontractor personnel MAY NOT perform contract work. Each of the proposed staff must complete "Security Clearance Form" (TBS 330-23E) upon request from Canada.

INSTRUCTIONS TO BIDDERS

IB01 Completion of Bid

- 1) The bid shall be:
 - (a) submitted on the BID AND ACCEPTANCE FORM provided by AAFC or on a clear and legible reproduced copy of such BID AND ACCEPTANCE FORM that must be identical in content and format to the BID AND ACCEPTANCE FORM provided by AAFC;
 - (b) based on the Bid Documents listed in the SPECIAL INSTRUCTIONS TO BIDDERS;
 - (c) correctly completed in all respects;
 - (d) signed, with an original signature, by a duly authorized representative of the Bidder; and
 - (e) accompanied by any other document or documents specified elsewhere in the solicitation where it is stipulated that said documents are to accompany the bid.
- 2) Subject to paragraph 6) of IB11, any alteration to the pre-printed or pre-typed sections of the BID AND ACCEPTANCE FORM, or any condition or qualification placed upon the bid shall be cause for disqualification. Alterations, corrections, changes or erasures made to statements or figures entered on the BID AND ACCEPTANCE FORM by the Bidder shall be initialed by the person or persons signing the bid. Initials shall be original(s). Alterations, corrections, changes or erasures that are not initialed shall be deemed void and without effect.
- 3) Unless otherwise noted elsewhere in the Bid Documents, facsimile copies of bids are not acceptable.

IB02 Identity or Legal Capacity of the Bidder

- 1) In order to confirm the authority of the person or persons signing the bid or to establish the legal capacity under which the Bidder proposes to enter into Contract, any Bidder who carries on business in other than its own personal name shall, if requested by Canada, provide satisfactory proof of:
 - (a) such signing authority; and
 - (b) the legal capacity under which it carries on business; prior to contract award. Proof of signing authority may be in the form of a certified copy of a resolution naming the signatory(ies) that is (are) authorized to sign this bid on behalf of the corporation or partnership. Proof of legal capacity may be in the form of a copy of the articles of incorporation or the registration of the business name of a sole proprietor or partnership.

IB03 Applicable Taxes

- 1) Bidders are not to include any amounts for Applicable Taxes (Goods and Services Tax (GST), Harmonized Sales Tax (HST) or Quebec Sales Tax (QST), whichever is applicable. Any amount levied in respect of Applicable Taxes shall be billed as a separate item in a progress claim submitted by the Contractor, and shall be paid to the Contractor in addition to the amount approved by Canada for work performed under the Contract. The Contractor shall be required to remit the appropriate amount to the appropriate tax authority in accordance with the applicable legislation.

IB04 Tax to Be Included

- 1) The Contractor is not entitled to use Canada's exemptions from any tax, such as provincial sales taxes, unless otherwise specified by law. The Contractor must pay applicable provincial sales tax, ancillary taxes, and any commodity tax, on taxable goods or services used or consumed in the performance of the Contract (in accordance with applicable legislation), including for material incorporated into real property.

IB05 Capital Development and Redevelopment Charges

- 1) For the purposes of GC1.5 in the General Conditions of the Contract, only fees or charges directly related to the processing and issuing of building permits shall be included. The Bidder shall not include any monies in the bid amount for special municipal development, redevelopment or other fees or charges which a municipal authority may seek as a prerequisite to the issuance of building permits.

IB06 Registry and Pre-qualification of Floating Plant

- 1) Dredges or other floating plant to be used in the performance of the Work must be of Canadian registry. For dredges or other floating plant that are not of Canadian make or manufacture, the Bidder must obtain a certificate of qualification from Industry Canada and this certificate must accompany the bid. Plant so qualified by Industry Canada may be accepted on this project.

IB07 Listing of Subcontractors and Suppliers

- 1) Notwithstanding any list of Subcontractors that the Bidder may be required to submit as part of the bid, the Bidder submitting the lowest acceptable bid shall, within 48 hours of receipt of a notice to do so, submit all information requested in the said notice including the names of Subcontractors and Suppliers for the part or parts of the Work listed. Failure to do so may result in the disqualification of its bid.

IB08 Bid Security Requirements

- 1) **NO** bid security is required for this solicitation notice.

IB09 Submission of Bid

- 1) The BID AND ACCEPTANCE FORM, duly completed, shall be enclosed and sealed in an envelope provided by the Bidder, and shall be addressed and submitted to the office designated on the Front Page of the BID AND ACCEPTANCE FORM for the receipt of bids. The bid must be received on or before the date and time set for solicitation closing.
- 2) Unless otherwise specified in the SPECIAL INSTRUCTIONS TO BIDDERS:
 - (a) the bid shall be in Canadian currency;
 - (b) exchange rate fluctuation protection is not offered; and
 - (c) any request for exchange rate fluctuation protection shall not be considered.
- 3) Prior to submitting the bid, the Bidder shall ensure that the following information is clearly printed or typed on the face of the bid envelope:
 - (a) Solicitation/File Number;
 - (b) Name of Bidder;
 - (c) Return address; and
 - (d) Closing Date and Time.
- 4) Subject to paragraph 6) of IB11, failure to comply with paragraphs 1), 2) and 3) of IB09 shall render the bid liable to disqualification. Timely and correct delivery of bids is the sole responsibility of the Bidder.

IB10 Revision of Bid

- 1) A bid submitted in accordance with these instructions may be revised by letter provided the revision is received at the office designated for the receipt of bids, on or before the date and time set for the closing of the bid. The letter shall:
 - (a) be on the Bidder's letterhead or bear a signature that identifies the Bidder;

- (b) for the lump sum portion of a bid, clearly identify the amount of the current revision. The total aggregate sum of all revisions submitted, including the current revision, shall be shown separately; and
 - (c) for the Price Per Unit portion of a bid, clearly identify the change(s) in the Price(s) per Unit and the specific item(s) to which each change applies. If a revision is to be applied to a specific item that was previously amended then, in addition to the amount of the current revision, the total aggregate sum of all revisions submitted, including the current revision, for that item shall be shown separately.
- 2) A letter submitted to confirm an earlier revision shall be clearly identified as "CONFIRMATION ONLY" for each contemplated change.
 - 3) Failure to comply with any of the above provisions shall result in the rejection of the non-compliant revision(s) only. The bid shall be evaluated based on the original bid submitted and all other compliant revision(s).

IB11 Acceptance of Bid

- 1) Canada may accept any bid, whether it is the lowest or not, or may reject any or all bids.
- 2) Without limiting the generality of paragraph 1) of IB11, Canada may reject a bid if any of the following circumstances is present:
 - (a) the Bidder, or any employee or subcontractor included as part of the bid, has been convicted under section 121 ("Frauds on the government" & "Contractor subscribing to election fund"), 124 ("Selling or purchasing office"), 380 ("Fraud committed against Her Majesty") or 418 ("Selling defective stores to Her Majesty") of the Criminal Code of Canada; or under paragraph 80(1)(d) ("False entry, certificate of return"), subsection 80 (2) ("Fraud against Her Majesty") or Section 154.01 ("Fraud against Her Majesty") of the *Financial Administration Act*;
 - (b) the Bidder's bidding privileges are suspended or are in the process of being suspended;
 - (c) the bidding privileges of any employee or subcontractor included as part of the bid are suspended or are in the process of being suspended, which suspension or pending suspension would render that employee or subcontractor ineligible to bid on the Work, or the portion of the Work the employee or subcontractor is to perform;
 - (d) with respect to current or prior transactions with Canada:
 - (i) the Bidder is bankrupt or if, for whatever reason, its activities are rendered inoperable for an extended period;
 - (ii) evidence, satisfactory to Canada, of fraud, bribery, fraudulent misrepresentation or failure to comply with any law protecting individuals against any manner of discrimination, has been received with respect to the Bidder, any of its employees or any subcontractor included as part of its bid;
 - (iii) Canada has exercised, or intends to exercise, the contractual remedy of taking the work out of the contractor's hands with respect to a contract with the Bidder, any of its employees or any subcontractor included as part of its bid; or
 - (iv) Canada determines that the Bidder's performance on other contracts is sufficiently poor to jeopardize the successful completion of the requirement being bid on.

- 3) In assessing the Bidder's performance on other contracts pursuant to subparagraph 2)(d)(iv) of IB11, Canada may consider, but not be limited to, such matters as:
 - (a) the quality of workmanship in performing the Work;
 - (b) the timeliness of completion of the Work;
 - (c) the overall management of the Work and its effect on the level of effort demanded of the department and its representative; and
 - (d) the completeness and effectiveness of the Contractor's safety program during the performance of the Work.
- 4) Without limiting the generality of paragraphs 1), 2) and 3) of IB11, Canada may reject any bid based on an unfavourable assessment of the:
 - (a) adequacy of the bid price to permit the work to be carried out and, in the case of a bid providing prices per unit or a combination of lump sum and prices per unit, whether each such price reasonably reflects the cost of performing the part of the work to which that price applies;
 - (b) Bidder's ability to provide the necessary management structure, skilled personnel, experience and equipment to perform competently the work under the Contract; and
 - (c) Bidder's performance on other contracts.
- 5) If Canada intends to reject a bid pursuant to a provision of paragraphs 1), 2), 3) or 4) of IB11, other than subparagraph 2)(b) of IB11, Canada shall so inform the Bidder and provide the Bidder ten (10) days within which to make representations, prior to making a final decision on the bid rejection.
- 6) Canada may waive informalities and minor irregularities in bids received if Canada determines that the variation of the bid from the exact requirements set out in the Bid Documents can be corrected or waived without being prejudicial to other Bidders.

IB12 Bid Costs

- 1) No payment will be made for costs incurred in the preparation and submission of a bid in response to the bid solicitation. Costs associated with preparing and submitting a bid, as well as any costs incurred by the Bidder associated with the evaluation of the bid, are the sole responsibility of the Bidder.

IB13 Compliance with Applicable Laws

- 1) By submission of a bid, the Bidder certifies that the Bidder has the legal capacity to enter into a contract and is in possession of all valid licences, permits, registrations, certificates, declarations, filings, or other authorizations necessary to comply with all federal, provincial and municipal laws and regulations applicable to the submission of the bid and entry into any ensuing contract for the performance of the work.
- 2) For the purpose of validating the certification in paragraph 1) of IB13, a Bidder shall, if requested, provide a copy of every valid licence, permit, registration, certificate, declaration, filing or other authorization listed in the request, and shall provide such documentation within the time limit(s) set out in the said request.
- 3) Failure to comply with the requirements of paragraph 2) of IB13 shall result in disqualification of the bid.

IB14 Approval of Alternative Materials

- 1) When materials are specified by trade names or trademarks, or by manufacturers' or suppliers' names, the bid shall be based on use of the named materials. During the bid period, alternative materials may be considered provided full technical data is received in writing by the Contracting Officer at least 10 calendar days prior to the bid closing date.

IB15 Income Tax Requirement

- 1) Payments made under applicable contracts must be reported by Canada for taxation purposes. To comply with this requirement, the successful bidder shall provide to Canada immediately upon award: its legal name; address; and Revenue Canada identifier (SIN, BN, GST/HST, T2N number) as is applicable.

IB16 Contingency Fees

- 1) The Bidder declares that the Bidder has not, directly or indirectly, paid or agreed to pay, and will not, directly or indirectly, pay a contingency fee to any individual for the solicitation, negotiation or obtaining of the contract if the payment of the fee would require the individual to file a return under section 5 of the *Lobbying Act*.

IB17 Status of the Bidder

- 1) The Bidder declares that the Bidder has not been convicted of an offence, other than an offence for which a pardon has been granted, under section 121, 124 or 418 of the *Criminal Code*.

CONTRACT DOCUMENTS (CD)

1. The following are the contract documents:

- a) Contract Page(s) when signed by Canada;
- b) Duly completed Bid and Acceptance Form and any Appendices attached thereto;
- c) Drawings and Specifications;
- d) General Conditions for Minor Works;
- e) Insurance Terms;
- f) Any amendment issued or any allowable bid revision received before the date and time set or solicitation closing;
- g) Any amendment incorporated by mutual agreement between Canada and the Contractor before acceptance of the bid; and
- h) Any amendment or variation of the contract documents that is made in accordance with the General Conditions.

2. The language of the contract documents is the language of the Bid and Acceptance Form submitted.

GENERAL CONDITIONS FOR MINOR WORKS

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GC1 GENERAL PROVISIONS

GC1.1 Definitions

- "Applicable Taxes" means the Goods and Services Tax (GST), the Harmonized Sales Tax (HST), and any provincial tax, by law, payable by Canada such as, the Quebec Sales Tax (QST) as of April 1, 2013.
- "Canada", "Her Majesty" means Her Majesty, the Queen in right of Canada;
- "Contract" means the contract documents referred to as such therein and every other document specified or referred to in any of them as forming part of the Contract, all as amended by agreement of the parties;
- "Contractor" means a person, with whom Canada enters into a Contract to do the Work;
- "Departmental Representative" means the person designated in the Contract, or by written notice to the Contractor, to act as the Departmental Representative for the purposes of the Contract, and includes a person, designated and authorized in writing by the Departmental Representative to the Contractor;
- "Material" includes all commodities, articles, machinery, equipment, fixtures and things required to be furnished in accordance with the Contract for incorporation into the Work;
- "Person" includes, unless there is an express stipulation in the Contract to the contrary, any partnership, proprietorship, firm, joint venture, consortium or corporation;
- "Plant" includes all tools, implements, machinery, vehicles, structures, equipment, articles and things that are necessary for the performance of the Contract, other than Material and those tools customarily provided by a trades person in practicing a trade;
- "Work" means everything that is necessary to be done, furnished or delivered by the Contractor to perform the Contract in accordance with the Contract Documents;

GC1.2 Contract Documents

1. In interpreting the Contract, in the event of discrepancies or conflicts between anything in the Drawings and Specifications or Scope of Work and the General Conditions, the General Conditions govern.
2. In interpreting the Drawings and Specifications, in the event of discrepancies or conflicts between:
 - (a) the Drawings and Specifications, the Specifications govern;
 - (b) the Drawings, the Drawings with the largest scale govern; and
 - (c) figured dimensions and scaled dimensions, the figured dimensions govern.

GC1.3 Assignment

1. This Contract shall not be assigned without the written consent of Canada.

GC1.4 Subcontracting

1. The Contractor shall:
 - (a) not subcontract the whole or any part of the Work without the written consent of the Departmental Representative except for subcontracts specified in the Contract; and
 - (b) ensure that all subcontracts entered into at any tier shall incorporate all the terms and conditions of the Contract that can reasonably be applied thereto.

GC1.5 Laws, Permits and Taxes

1. The Contractor shall comply with all legislative and regulatory provisions whether federal, provincial, territorial or municipal applicable to the performance of the Work and shall require compliance therewith by all of its subcontractors and suppliers at any tier as if the Work were being performed for an owner other than Canada.
2. Unless otherwise provided for in the Contract, the Contractor shall obtain all permits and hold all certificates and licenses required for the performance of the Work.
3. Applicable Taxes will be paid by Canada at time when a progress payment is being made. It

is the sole responsibility of the Contractor to charge Applicable Taxes at the correct rate in accordance with applicable legislation. The Contractor agrees to remit to appropriate tax authorities any amounts of Applicable Taxes paid or due.

4. The Contractor is not entitled to use Canada's exemptions from any tax, such as provincial sales taxes, unless otherwise specified by law. The Contractor must pay applicable provincial sales tax, ancillary taxes, and any commodity tax, on taxable goods or services used or consumed in the performance of the Contract (in accordance with applicable legislation), including for material incorporated into real property.

GC1.6 Former Public Office Holders

1. No former public office holder who is not in compliance with the post-employment provisions of the Conflict of Interest and Post-Employment Code for Public Office Holders shall derive a direct benefit from the Contract.

GC1.7 Status of the Contractor

1. The Contractor is engaged as an independent Contractor for the sole purpose of performing the Work. Neither the Contractor nor any of its personnel is engaged as an employee, servant or agent of Canada. The Contractor is responsible for all deductions and remittances required by law in relation to its employees including those required for Canada or Quebec Pension Plans, employment insurance, workers' compensation, and income tax.
2. The Contractor declares that the Contractor has not been convicted of an offence, other than an offence for which a pardon has been granted, under section 121, 124 or 418 of the Criminal Code.

GC1.8 Contingency Fees

1. The Contractor declares that the Contractor has not, directly or indirectly, paid or agreed to pay, and will not, directly or indirectly, pay a contingency fee to any individual for the solicitation, negotiation or obtaining of the contract if the payment of the fee would require the individual to file a return under section 5 of the *Lobbying Act*.

GC1.9 Disclosure of Basic Information

1. The Contractor consents, in the case of a contract that has a value in excess of \$10,000, to the public disclosure of basic information, other than information described in any of paragraphs 20(1)(a) to (d) of the *Access to Information Act*, relating to the contract.

GC2 ADMINISTRATION OF THE CONTRACT

GC2.1 Departmental Representative's Rights and Obligations

1. The Departmental Representative shall:
 - (a) have access to the Work at all times;
 - (b) decide questions regarding what has been done or what the Contractor is required to do; (c) decide questions regarding the acceptability of the quality or quantity of any Labour, Plant or Material used or consumed in the execution of the Work; and
 - (d) decide questions regarding the timing and scheduling of the Work.

GC2.2 Contractor's Superintendent and Workers

1. The Contractor shall keep a competent superintendent and capable and skilled workers on the site of the Work at all times during the progress of the Work. If, in the opinion of the Departmental Representative, the superintendent or the workers are deemed to be unacceptable because of incompetence, improper conduct or security risk, they shall be removed from the site of the Work and replaced forthwith.

GC2.3 Records to be kept by the Contractor

1. The Contractor shall maintain and keep intact complete records relating to the Work together with all tender calls, quotations, contracts, correspondence, invoices and any payment of fees or other compensation for the solicitation, negotiating or obtaining of the contract until the expiration of two (2) years after the date that a Certificate of Completion is issued or the final invoice is paid if no Certificate of Completion is issued. The Contractor shall, upon request from the Departmental Representative, make said records available for copy, audit or inspection to any person(s) acting on behalf of Canada.
2. The Contractor shall cause all Subcontractors, and all other Persons or entities directly or indirectly involved with the Work, to comply with the requirements of GC 2.3.1.

GC2.4 Notices

1. Any notice shall be in writing and may be delivered by hand, by courier, by registered or regular mail, or by facsimile or other electronic means that provides a paper record of the text of the notice. The notice shall be addressed to the party for whom it is intended at the address in the Contract or at the last address from which the sender has received notice in accordance with this section. Any notice shall be deemed to be effective on the day it is received at that address or four (4) days after being sent, whichever is the earlier.

GC3 EXECUTION OF THE WORK

GC3.1 Material, Plant, and Real Property Become the Property of Canada

1. All Material and Plant used or consumed for the purposes of the Work shall be the property of Canada. The Material and Plant shall be used only for the purposes of the Work, and shall not be removed from the site of the Work until so approved by the Departmental Representative.
2. The Contractor shall be liable for all loss or damage to Material or Plant that is the property of Canada by virtue of this section.

GC3.2 Cooperation with Other Contractors

1. The Contractor shall cooperate fully with other contractors or workers sent onto the site of the Work by the Departmental Representative.
2. If, at the time the Contract was executed: the Contractor could not have reasonably foreseen the sending of other contractors or workers onto the site of the Work; and, the Contractor incurs extra costs in complying with GC 3.2.1; and, the Contractor gives written notice of claim for the extra costs within ten (10) days from the date upon which the other contractors or workers were sent onto the site of the Work; then, Canada shall pay an additional amount to the Contractor, calculated pursuant to GC 5.7.

GC3.3 Use of the Work and Cleanup of Site

1. The Contractor shall maintain the site of the Work in a tidy condition and free from the accumulation of waste material throughout the duration of the Contract.
2. Before the Departmental Representative issues the Certificate of Completion or approves payment of the final invoice, the Contractor shall remove all materials, tools, construction machinery, equipment, waste products and debris from the site of the Work.
3. Where the Work affects occupied portions of a building, the Contractor shall ensure continuity of all building services and shall ensure safe access for all persons requiring access to said building.

GC 3.4 Warranty and Rectification of Defects

1. Without restricting any warranty or guarantee implied or imposed by law or any extended warranty specified in the Contract, the Contractor shall, upon notice from the Departmental Representative and at its own expense, rectify all defects which appear in the Work within twelve (12) months from the date of issuance of the Certificate of Completion pursuant to GC 5.6.1, or from the date of the negotiable instrument issued as final payment if a Certificate of Completion is not issued, whichever is applicable.
2. The notice referred to in GC 3.4.1 shall be in writing and shall include the number of days within which the defect or fault is to be rectified.
3. The Contractor shall transfer and assign, to Canada, any subcontractor, manufacturer or supplier extended warranties or guarantees implied or imposed by law or contained in the contract documents covering periods beyond the twelve (12) months stipulated above. Extended warranties or guarantees referred to herein shall not extend the twelve (12) month period whereby the Contractor must rectify and make good any defect or fault that appears in the work or comes to the attention of Canada.

GC 4 PROTECTION, HEALTH AND SAFETY

GC 4.1 Material, Plant and Real Property Supplied by Canada

1. The Contractor, having care, custody and control of the Work and its site, shall be responsible for any loss or damage, excluding reasonable wear and tear, to any property of Canada arising out of the performance of the Work whether or not such loss arises from causes beyond the Contractor's control.

GC 4.2 Construction Safety

1. The Contractor, having care, custody and control of the Work and its site, shall be responsible for any loss or site of the Work and for initiating, maintaining and supervising all safety inspections, precautions and programs in connection with the performance of the Work in accordance with the health and safety legislation in force in the Province where the Work is being performed.

GC5 TERMS OF PAYMENT

GC5.1 Definitions

For the purposes of this section:

- Payment Period means a period of thirty (30) days or such other longer period as may be agreed between the Contractor and the Departmental Representative.
- An amount is Due and Payable when it is due and payable by Canada to the Contractor in accordance with the terms of the Contract.
- An amount is Overdue when it remains unpaid after the day upon which it is due and payable.
- Date of Payment means the date of the negotiable instrument of an amount due and payable by the Receiver General for Canada.
- Fixed Price Arrangement means that part of the Contract that prescribes a lump sum as payment for performance of the Work to which it relates.
- Unit Price Arrangement means that part of the Contract that prescribes the product of a Price Per Unit multiplied by a number of Units of Measurement of a Class as payment for performance of the Work to which it relates.
- Price Table means the table set out in the BID AND ACCEPTANCE FORM.
- Bank Rate means the rate of interest established from time to time by the Bank of Canada as the minimum rate at which the Bank of Canada makes short term advances to members of the Canadian Payments Association.

- Average Bank Rate means the simple arithmetic mean of the Bank Rates in effect at 4:00 pm Eastern Time each day during the calendar month which immediately precedes the calendar month in which payment is made.
- Duration of the Work means the number of calendar days required to complete the Work, commencing on the first day following receipt by the Contractor of the fully executed Contract and ending the day on which the Departmental Representative verifies that the Work has been satisfactorily completed.

GC5.2 Payment- General Provisions

1. It is a condition precedent to Canada's obligation under GC 5.3.5 that the Contractor has made and delivered to the Departmental Representative, a statutory declaration as described in GC 5.2.2.
2. A statutory declaration in a form acceptable to Canada shall contain a declaration that the Contractor has complied with all lawful obligations with respect to workers and that all lawful obligations towards Subcontractors and Suppliers in respect of the Work under the Contract have been fully discharged.
3. A payment by Canada pursuant to this section shall not be construed as evidence that the Work is satisfactory or in accordance with the Contract.
4. Delay in making payment by Canada under the Contract shall not constitute a breach of Contract.
5. Without limiting any right of setoff or deduction given or implied by law or elsewhere in the Contract, Canada may retain from amounts payable to the Contractor under the Contract, any amount payable to Canada by the Contractor under the Contract or any other current contract.
6. No additional payment shall be made for delays where the cause of the delay was under the control of the Contractor.
7. Except as provided for in these General Conditions, the amount payable to the Contractor under the Contract shall not be increased or decreased by reason of any increase or decrease in cost of the Work brought about by any increase in the cost of Labour, Plant or Material.
8. In the event of a change, including a new imposition or repeal of any tax, customs or other duty, charge, or any similar imposition that is imposed under sales or excise tax legislation of the Government of Canada or any Provincial or Territorial legislation, affects the cost of the Work to the Contractor, and occurs after the date of submission by the Contractor of the Contractor's bid, the contract amount shall be adjusted by an amount equal to the increased or decreased cost to the Contractor, which amount shall be determined through a detailed examination of the Contractor's records.
9. It is a term of every contract providing for the payment of any money by Her Majesty that payment under that contract is subject to there being an appropriation for the particular service for the fiscal year in which any commitment under that contract would come in course of payment. Section 40, *Financial Administration Act*, R. S., 1985, c. F-11, s. 40.

GC5.3 Progress Payments

1. Where the duration of the Work is greater than thirty (30) days, the Contractor shall be entitled to receive monthly progress payments upon submitting a progress claim in a form approved by the Departmental Representative. Where the duration of the Work is less than thirty (30) days, the Contractor shall submit a progress claim after the Work is complete.
2. On the expiration of a Payment Period, the Contractor shall deliver to the Departmental Representative:

- (a) a written progress claim that fully describes any part of the Work that has been satisfactorily completed and any Material that was delivered to the site of the Work but not incorporated into the Work during the Payment Period for which the progress claim relates;
 - (b) a completed and signed statutory declaration as described in GC 5.2.2; and
 - (c) in the case of the initial progress claim and the request for final payment, satisfactory evidence of compliance with workers compensation legislation that is applicable to the place of the Work.
3. Not later than ten (10) days after receipt of a progress claim properly submitted in accordance with GC 5.3.2, the Departmental Representative shall issue a progress report, a copy of which shall be given to the Contractor.
4. A progress report shall indicate the value of the part of the Work and Material described in the progress claim that, in the opinion of Canada:
 - (a) is in accordance with the Contract; and
 - (b) was not included in any other progress report related to the Contract.
5. Not later than thirty (30) days after the receipt by the Departmental Representative of a properly submitted progress claim and supporting documentation, Canada shall make a progress payment to the Contractor in an amount that is equal to one of the following:
 - (a) 90 percent of the value that is indicated in the progress report; or
 - (b) If the Departmental Representative is satisfied that the Work is substantially complete and is acceptable for use by Canada, 100 percent of the value of the Work and Material that is in accordance with the Contract, less amounts previously paid for under the Contract, less the amount equal to the estimated cost of completing the Work and the estimated cost of rectifying defects and faults in the Work as determined by the Departmental Representative; or
 - (c) If the Departmental Representative is satisfied that the Work is complete, 100 percent of the value of the Work that is in accordance with the Contract less amounts previously paid for under the Contract;

plus Applicable Taxes and less the aggregate of any amounts payable to or costs and damages claimed by Canada or by a Claimant against the Contractor.
6. The Departmental Representative reserves the right to increase or decrease the quantities submitted by the Contractor if there is a disagreement between the Contractor's invoiced quantities and the quantities shown in the records maintained at the site of the Work.
7. Subject to GC 5.3.8, GC 5.3.9 and GC 5.3.10, the Departmental Representative and the Contractor may, by an agreement in writing, amend a Price Per Unit as set out in the Price Table for any Class of Labour, Plant or Material provided the Certificate of Measurement shows that the Authorized Quantity of the Class of Labour, Plant or Material actually performed, used or supplied by the Contractor in performing the Work is:
 - (a) less than 85 percent of the Estimated Total Quantity; or
 - (b) in excess of 115 percent of the Estimated Total Quantity.
8. In no event shall the total amount of an Item set out in the Price Table that has been amended pursuant to GC 5.3.7 (a) exceed the amount that would have been Payable to the Contractor had the Estimated Total Quantity actually been performed, used, or supplied.
9. An amendment that is made necessary by GC 5.3.7 (b) shall apply only to the quantities that are in excess of 115 percent.
10. Where the Departmental Representative and the Contractor fail to agree on the amount of any adjustment to a Price Per Unit as contemplated by GC 5.3.7, the amended Price Per Unit shall be determined in accordance with GC 5.7.

GC5.4 Interest on Overdue Accounts

1. Canada shall be liable to pay, to the Contractor, simple interest at the Average Bank Rate plus 3 percent per annum on any amount that is Overdue. The interest shall apply from the date such amount becomes Overdue until the day prior to the Date of Payment inclusively.
2. Interest shall be paid to the Contractor without demand on Overdue payments, except, in respect to amounts which are less than fifteen (15) days Overdue, in which case, no interest shall be paid unless the Contractor so demands.
3. Canada shall not be liable to pay interest where Canada is not responsible for the delay in paying the Contractor.

GC5.5 Payment in the Event of Termination

1. If the Contract is terminated pursuant to GC 7.4, Canada shall pay the Contractor:
 - (a) an amount, as agreed upon by the Contractor and the Departmental Representative, for all Labour, Plant and Material performed, used or supplied by the Contractor as at the date of termination plus:
 - (i) any fully supported termination costs incurred by the Contractor, less
 - (ii) any amounts payable to or costs and damages claimed by Canada or by a Claimant, against the Contractor; or
 - (b) failing such an agreement, an amount calculated in accordance with GC 5.7.2.

GC5.6 Final Completion

1. A Certificate of Completion shall be issued to the Contractor on the date on which the Work has been completed and the Contractor has complied with the Contract and all orders and directions made pursuant thereto, all to the satisfaction of the Departmental Representative.
2. Where the Contract is, in whole or in part, a Unit Price Arrangement, the Departmental Representative shall, at the same time as the issuance of the Certificate of Completion, issue a Certificate of Measurement setting out the Authorized Quantities used or employed in respect of the classes and units set out in the Price Table under the BID AND ACCEPTANCE FORM and any subsequent amendments thereto, such certificate to be binding upon the Contractor and Canada.

GC5.7 Determination of Price

1. By mutual agreement:
 - (a) where a Lump Sum Arrangement applies to the Contract or a part thereof, the price of any change shall be the aggregate estimated cost of Labour, Plant and Material that is required for the change as agreed upon in writing by the Contractor and Canada, and include an allowance for overhead, margin and the risk of undertaking the work within the stipulated amount;
 - (b) where a Unit Price Arrangement applies to the Contract or a part thereof, the Contractor and Canada may, by agreement in writing, add Items, Units of Measurement, Estimated Total Quantities and Price Per Units to the Price Table;
 - (c) a Price Per Unit referred to in GC 5.7.1 (b) shall be determined on the basis of the aggregate estimated cost of Labour, Plant and Material that is required for the additional Item as agreed upon by the Contractor and Canada, and include an allowance for overhead, margin and the risk of undertaking the work;
 - (d) to facilitate approval of the price of the additional Item, the Contractor shall submit a cost estimate breakdown identifying, as a minimum, the estimated cost of Labour, Plant, Material, each subcontract amount, and the amount of the appropriate percentage allowance;
 - (e) if no agreement can be reached as contemplated in GC5.7.1 (a), the price shall be determined in accordance with GC 5.7.2; and

- (f) if no agreement can be reached as contemplated in GC 5.7.1 (b) and GC 5.7.1 (c), the Departmental Representative shall determine the Class and the Unit of Measurement of the Item of Labour, Plant or Material and the Price Per Unit shall be determined in accordance with GC 5.7.2.

2. Following Completion of the Additional Work

- (a) Where it is not possible to predetermine, or where there is failure to agree upon the price of a change in the Work, the price of the change shall be equal to the aggregate of:
 - (i) all reasonable and proper amounts actually expended or legally payable by the Contractor in respect of the Labour, Plant and Material that fall within one of the classes of expenditure described in GC 5.7.2(b), that are directly attributable to the performance of the Contract; plus
 - (ii) an allowance for profit and all other expenditures or costs equal to 10 percent of the sum of the amounts referred to in GC 5.7.2 (a)(i); plus
 - (iii) interest, if any, paid by the Contractor on the amounts determined under GC 5.7.2 (a)(i) and (ii), calculated in accordance with GC 5.4.
- (b) The cost of Labour, Plant and Material referred to in GC 5.7.2 (a) shall be limited to the following categories of expenditure:
 - (i) payments to Subcontractors and suppliers;
 - (ii) wages, salaries and traveling expenses of employees of the Contractor located at the site of the Work and that portion of wages, salaries, bonuses, living and traveling expenses of personnel of the Contractor generally employed at the head office or at a general office of the Contractor provided they are actually and properly engaged on the Work under the Contract;
 - (iii) assessments payable under any statutory authority relating to workers' compensation, employment insurance, pension plan or holidays with pay, provincial health or insurance plans, environmental reviews, and GST/HST collection costs;
 - (iv) rent that is paid for Plant, or an amount equivalent to the said rent if the Plant is owned by the Contractor, that is necessary for and used in the performance of the Work, if the rent or the equivalent amount is reasonable and use of that Plant had been approved by the Departmental Representative;
 - (v) payments for maintaining and operating Plant necessary for and used in the performance of the Work, and payments for effecting repairs thereto that, in the opinion of the Departmental Representative, are necessary for the proper performance of the Contract, other than payments for any repairs to the Plant arising out of defects existing before its allocation to the Work;
 - (vi) payments for Material that is necessary for and incorporated in the Work, or that is necessary for and consumed in the performance of the Contract;
 - (vii) payments for preparation, delivery, handling, erection, installation, inspection, protection and removal of the Plant and Material necessary for and used in the performance of the Contract; and
 - (viii) any other payments made by the Contractor with the approval of the Departmental Representative that are necessary for the performance of the Contract in accordance with the Contract Documents.

GC5.8 Claims Against and Obligations of the Contractor or Subcontractor

- 1. The Contractor shall ensure that all its lawful obligations arising out of the performance of the Work are discharged and satisfied at least as often as the Contract requires Canada to pay the Contractor. The Contractor shall provide the Departmental Representative with a Statutory Declaration, as referred to in GC 5.2.2. If any third party claims and outstanding obligations exist under the Contract, a Statutory Declaration shall also be accompanied by letter documentation that clearly identifies the existence and condition of any third party disputed claims and outstanding obligations.

2. In order to discharge lawful obligations of and satisfy lawful claims against the Contractor or a Subcontractor arising out of the performance of the Work, Canada may:
 - (a) pay an amount from money that is due and payable to the Contractor pursuant to the Contract directly to the claimant against the Contractor or the Subcontractor; or
 - (b) withhold from any amount that is due and payable to the Contractor pursuant to the Contract the full amount of the claim or any portion thereof. Monies withheld for this purpose shall not be subject to any interest payment in the event such claims are rejected.
3. The amount referred to in GC 5.8.2 (a) shall be that amount which the Contractor would have been obliged to pay to such claimant had the provisions of the Provincial or Territorial lien legislation, or in the province of Quebec, the law relating to mortgage, been applicable to the Work. Any such claimant need not comply with the provisions of such legislation setting out the steps by way of notice, registration, or otherwise as might have been necessary to preserve or perfect any claim for lien or mortgage which the claimant might have had.
4. For the purposes of GC 5.8, a claim shall be considered lawful when it is so determined:
 - (a) by a court of competent jurisdiction;
 - (b) by an arbitrator duly appointed to arbitrate the said claim; or
 - (c) by written notice delivered to the Departmental Representative and signed by the Contractor authorizing payment of the said claim(s).
5. A payment made pursuant to GC 5.8.2 is, to the extent of the payment, a discharge of Canada's liability to the Contractor under the Contract and may be deducted from any amount payable to the Contractor under the Contract.
6. GC 5.8.2 shall only apply to claims and obligations where:
 - (a) the notification of which has set forth the amount claimed to be owing and the person who by Contract is primarily liable;
 - (b) the notification or a copy of the notification was received by the Departmental Representative in writing before final payment is made to the Contractor and within one hundred and twenty (120) days of the date on which the claimant:
 - (i) should have been paid in full under the claimant's Contract with the Contractor or Subcontractor where the claim is for money that was lawfully required to be held back from the claimant; or
 - (ii) performed the last of the labour or furnished the last of the Plant or Material pursuant to the claimant's Contract with the Contractor or Subcontractor where the claim is not for money referred to in GC 5.8.6 (b)(i); and
 - (c) the proceedings to determine the right to payment for the claim shall have commenced within one year from the date that the notice referred to in GC 5.8.6 (b) was received by the Department Representative.
7. The Departmental Representative shall inform the Contractor in writing of receipt of any notification of claim and of the intention of Canada to withhold funds pursuant to GC 5.8.2. The Contractor may, at any time thereafter and until payment is made to the claimant, post with Canada, security in the form of a Claimant's Payment Bond acceptable to Canada and in an amount equal to the value of the said claim. Upon receipt of such security Canada shall release to the Contractor any funds which would be otherwise payable to the Contractor, that were withheld pursuant to the provisions of GC 5.8.2.

GC6 CHANGES IN THE WORK

GC6.1 Changes in the Work

1. Canada shall have the right to order additional Work, dispense with, or change the whole or any part of the Work described in the Drawings and Specifications or Scope of the Work.

2. The Departmental Representative shall decide whether anything done or not done as a result of directions given under GC 6.1.1 has increased or decreased the cost of the Work to the Contractor and where the cost of the Work has increased or decreased, the amount payable under the Contract shall be increased or decreased by an amount calculated in accordance with GC5.7.
3. Any change in the terms of the Contract, other than changes that may be ordered by Canada or the Departmental Representative pursuant to GC 6.1.1, may be made only by agreement in writing between Canada and the Contractor.

GC6.2 Changes in Subsurface Conditions and Delays by Canada

1. No extra payment shall be made to the Contractor for any extra expense, loss or damage for any reason unless Canada shall certify that such extra expense, loss or damage is directly attributable to:
 - (a) a substantial difference between the subsurface conditions as indicated in the Drawings and Specifications or Scope of Work and the actual conditions found at the site of the Work; or
 - (b) the neglect or delay by Canada, occurring after the date of award of the Contract:
 - (i) in providing any information or the doing of any act which Canada is required expressly by the Contract to do or as required by a known custom of the trade; or
 - (ii) in suspending the Work pursuant to GC 7.3.
2. The Contractor shall, within ten (10) days immediately after encountering such subsurface conditions or such neglect or delay, give written notice to the Departmental Representative of a claim for such extra expense, loss or damage. Failure to provide such written notice shall render the claim null and void.
3. The amount of any extra payment made under this section shall be calculated in accordance with GC5.7.
4. If, in the opinion of the Departmental Representative, any difference in subsurface conditions referred to in GC 6.2.1 results in a savings to the Contractor, the amount of said savings shall be deducted from the Contract Amount owing to the Contractor.

GC6.3 Extension of Time

1. Upon written application by the Contractor made before the date fixed for the completion of the Work, Canada may extend the time for completion of the Work if, in the opinion of Canada causes beyond the control of the Contractor have delayed its completion.
2. If the Contractor does not complete the Work by the day fixed for its completion, but completes it thereafter, the Contractor shall:
 - (a) pay all Canada's inspection costs relating to the Work incurred after the stipulated completion date; and
 - (b) compensate Canada for any loss or damage resulting from the failure by the Contractor to complete the Work by the completion date fixed by the Contract.

Unless, in the opinion of Canada, such delay was due to causes beyond the control of the Contractor or it is in the public interest to waive the whole or any part of the payment.

GC7 DEFAULT, SUSPENSION OR TERMINATION OF CONTRACT

GC7.1 Taking the Work Out of the Contractor's Hands

1. By giving notice in writing to the Contractor, Canada may take all or any part of the Work out of the Contractor's hands, and may employ such means as Canada sees fit to have the Work completed if the Contractor:

- (a) fails to remedy any delay in the commencement or default in the execution of the Work to the satisfaction of the Departmental Representative within six (6) days of Canada giving written notice to the Contractor to do so;
 - (b) defaults in the completion of any part of the Work within the time fixed by the Contract for its completion;
 - (c) becomes insolvent or commits an act of bankruptcy and has neither made a proposal to its creditors nor filed a notice of intention to make such a proposal pursuant to the Bankruptcy and Insolvency Act;
 - (d) abandons the Work;
 - (e) makes an assignment contrary to GC 1.3; and or
 - (f) otherwise fails to observe or perform any of the provisions of the Contract.
2. If the whole or any part of the Work is taken out of the Contractor's hands, the Contractor's right to any further payment that is due or accruing due under the Contract is extinguished.
 3. The Contractor shall be liable to pay Canada, upon demand, an amount that is equal to the sum of all losses and damages incurred or sustained by Canada in respect of the Contractor's failure to complete the Work.
 4. If the whole or any part of the Work that is taken out of the Contractor's hands pursuant to GC 7.1.1 is completed by Canada, the Departmental Representative shall calculate the amount, if any, of the holdback or progress claims that had accrued and was due prior to the date on which the Work was taken out of the Contractor's hands.
 5. If it is determined that there is an amount that is not required for the purposes of having the Work performed or of compensating Canada for any other loss or damage incurred or sustained by reason of the Contractor's default, Canada may then pay the Contractor the amount determined not to be required pursuant to GC 7.1.4.

GC7.2 Effect of Taking the Work Out of the Contractor's Hands

1. The taking of the Work or part thereof out of the Contractor's hands pursuant to GC 7.1.1 does not operate so as to relieve or discharge the Contractor from any obligations under the Contract or imposed upon the Contractor by law except the obligation to complete the performance of that part of the Work that was taken out of the Contractor's hands.
2. All Plant and Material and the interest of the Contractor in all real property, licenses, powers and privileges acquired, used, provided or consumed by the Contractor under the Contract shall continue to be the property of Canada without compensation to the Contractor.
3. When the Departmental Representative certifies that any Plant, Material or any interest of the Contractor referred to in GC 7.2, is no longer required for the purpose of the Work, or that it is not in the interests of Canada to retain that Plant, Material or interest, it shall revert to the Contractor.

GC7.3 Suspension of the Contract

1. Canada may, upon giving notice in writing to the Contractor, suspend the performance of the Work at any time. The Contractor shall comply with such notice immediately, subject to any conditions that may be stipulated in the notice.
2. If Canada suspends the Work for thirty (30) days or less the Contractor shall, subject to its remedy under GC 5.7, complete the Work when called upon to do so. If Canada suspends the Work for a period in excess of thirty (30) days, the Contractor may request that Canada terminate the Contract pursuant to GC 7.4.
3. It is the responsibility of the Contractor to mitigate all costs during the suspension period.

GC7.4 Termination of the Contract

1. Canada may terminate the Contract at any time by giving notice of termination in writing to the Contractor and upon receipt of such notice the Contractor shall cease all operations in performance of the Contract, subject to any conditions that may be stipulated in the notice.
2. Termination under GC 7.4.1 shall not relieve the Contractor of any legal or contractual obligations other than that portion of Work that remains to be completed at the time of the termination.
3. Payment, in event of termination under this subsection, shall be made pursuant to the provision of GC5.5.

GC8 DISPUTE RESOLUTION

1. The Contractor may, within 10 days after the communication to the Contractor of any decision or direction referred to in GC2.1 (b) and GC6.1, protest that decision or direction.
2. A protest referred to in GC8.1 shall be in writing, contain full reasons for the protest, be signed by the Contractor and be given to Canada.
3. If the Contractor gives a protest pursuant to GC8.2, any compliance by the Contractor with the decision or direction that was protested shall not be construed as an admission by the Contractor of the correctness of that decision or direction, or prevent the Contractor from taking whatever action the Contractor considers appropriate in the circumstances.
4. The giving of a protest by the Contractor pursuant to GC8.2 shall not relieve the Contractor from complying with the decision or direction that is the subject of the protest.
5. Subject to GC8.6, the Contractor shall take any action referred to in GC8.3 within 3 months after the date of the Certificate of Completion referred to in GC5.6 and not afterwards, except where it is otherwise provided by law.
6. The Contractor shall take any action referred to in GC8.3 resulting from a direction under GC3.4, within 3 months after the expiry of a warranty or guarantee period and not afterwards, except where it is otherwise provided by law.
7. Subject to GC8.8, if Canada determines that the Contractor's protest is justified, Canada shall pay the Contractor the cost of the additional labour, Plant and Material necessarily incurred by the Contractor in carrying out the protested decision or direction.
8. Costs referred to in GC8.7 shall be calculated in accordance with GC5.7.

GC9 INDEMNIFICATION AND INSURANCE

GC9.1 Indemnification

1. The Contractor shall indemnify and save harmless Canada, its servants, agents and all those for whom Canada may be, in law, responsible, from and against all claims, demands, losses, damages, costs and legal proceedings by whomever made, sustained, brought or prosecuted, and in any manner based upon, occasioned by or attributed to the activities of the Contractor, the Contractor's employees, agents or persons for whom the Contractor is, in law, responsible for the performance or purported performance of the Contract, including an infringement or alleged infringement of a patent of invention or any other kind of intellectual property.
2. For the purpose of GC 9.1.1, activities include any act improperly carried out and any omission or delay in carrying out an act.
3. The Contractor's liability to indemnify or reimburse Canada under the Contract shall not affect or prejudice Canada from exercising any rights available to Canada at law or in equity.

GC9.2 Insurance Contracts

1. The Contractor shall, at the Contractor's expense, obtain and maintain insurance contracts in respect of the work and shall provide evidence thereof to Canada in accordance with the requirements of the INSURANCE TERMS.
2. The insurance contracts referred to in GC 9.2.1 shall:
 - (a) be in a form, of the nature, in the amounts, for the periods and containing the terms and conditions specified in INSURANCE TERMS; and
 - (b) provide for the payment of claims under such insurance contracts in accordance with GC9.3.

GC9.3 Insurance Proceeds

1. In the case of a claim payable under a Builders Risk/Installation (All Risks) insurance contract maintained by the Contractor pursuant to GC 9.2, the proceeds of the claim shall be paid directly to Canada, and
 - (a) the monies so paid shall be held by Canada for the purposes of the Contract, or
 - (b) if Canada elects, shall be retained by Canada, in which event they vest in Canada absolutely.
2. In the case of a claim payable under a General Liability insurance contract maintained by the Contractor pursuant to GC 9.2, the proceeds of the claim shall be paid by the insurer directly to the claimant.
3. If an election is made pursuant to GC 9.3.1, Canada may cause an audit to be made of the accounts of the Contractor and of Canada in respect of the part of the work that was lost, damaged or destroyed for the purpose of establishing the difference, if any, between:
 - (a) the aggregate of the amount of the loss or damage suffered or sustained by Canada, including any costs incurred in respect of the clearing and cleaning of the Work and its site and any other amount that is payable by the Contractor to Canada under the Contract, minus any monies retained pursuant to GC 9.3.1 (b); and
 - (b) the aggregate of the amounts payable by Canada to the Contractor pursuant to the Contract up to the date of the loss or damage.
4. A difference that is established pursuant to GC 9.3.3 shall be paid forthwith by the party who is determined by the audit to be the debtor to the party who is determined by the audit to be the creditor.
5. When payment of a deficiency has been made pursuant to GC 9.3.4, all rights and obligations of Canada and the Contractor under the Contract shall, with respect only to the part of the work that was the subject of the audit referred to in GC 9.3.3, be deemed to have been expended and discharged.
6. If an election is not made pursuant to GC 9.3.1 (b), the Contractor shall, subject to GC 9.3.7, clear and clean the work and its site and restore and replace the part of the work that was lost, damaged or destroyed at the Contractor's expense as if that part of the work had not yet been performed.
7. When the Contractor clears and cleans the Work and its site and restores and replaces the work referred to in GC 9.3.6, Canada shall pay the Contractor out of the monies referred to in GC 9.3.1 so far as they will thereon to extend.
8. Subject to GC 9.3.7, payment by Canada pursuant to GC 9.3.7 shall be made in accordance with the Contract but the amount of each payment shall be 100 percent of the amount claimed notwithstanding GC 5.3 a) and b).

INSURANCE TERMS

IN1 GENERAL

- IN1.1 Worker's Compensation
- IN1.2 Indemnification
- IN1.3 Proof of Insurance
- IN1.4 Insured
- IN1.5 Payment of Deductible

IN2 COMMERCIAL GENERAL LIABILITY

- IN2.1 Scope of Policy
- IN2.2 Period of Insurance

IN3 AUTOMOBILE INSURANCE

- IN3.1 Scope of Policy

IN1 GENERAL

IN1.1 Worker's Compensation

- 1) The Contractor shall provide and maintain Worker's Compensation Insurance in accordance with the legal requirements of the Province or Territory where the work is being carried out.

IN1.2 Indemnification

- 1) The insurance required by the provisions of these Insurance Terms shall in no way limit the Contractor's responsibility under the Indemnification clause of the General Conditions of the contract. Any additional coverage the Contractor may deem necessary to fulfill his obligations under the aforesaid clause shall be at his own discretion and expense.

IN1.3 Proof of Insurance

- 1) Before commencement of the Work, and within thirty (30) days after acceptance of its bid, the Contractor shall deposit with Canada a CERTIFICATE OF INSURANCE (form AAFC I AAC5314) available upon request.
- 2) Upon request by Canada, the Contractor shall provide originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the provisions contained herein.

IN1.4 Insured

- 1) Each policy shall insure the Contractor and shall include Her Majesty the Queen in right of Canada, represented by the Minister of Agriculture & Agri-Food Canada as an additional Insured, with respect to liability arising out of the operations of the contractor with regard to the work.

IN1.5 Payment of Deductible

- 1) The payment of monies up to the deductible amount made in satisfaction of a claim shall be borne by the Contractor.

IN2 COMMERCIAL GENERAL LIABILITY

IN2.1 Scope of Policy

- 1) The insurance coverage provided shall not be less than that provided by IBC Form 2100, as amended from time to time, and shall have:
 - (a) an Each Occurrence Limit of not less than \$1,000,000.00 ;

- (b) a Products/Completed Operations Aggregate Limit of not less than \$1,000,000.00; and
 - (c) a General Aggregate Limit of not less than \$2,000,000.00 Per policy year, if the policy is subject to such a limit.
- 2) The policy shall either include or be endorsed to include coverage for the following exposures or hazards if the Work is subject thereto:
- (a) Blasting.
 - (b) Pile driving and caisson work.
 - (c) Underpinning.
 - (d) Removal or weakening of support of any building or land whether such support be natural or otherwise if the work is performed by the insured contractor.
 - (e) Asbestos.
 - (f) Non-owned Automobile Policy.

IN2.2 Period of Insurance

- 1) Unless otherwise directed in writing by Canada, or, otherwise stipulated elsewhere herein, the policy required herein shall be in force and be maintained from the date of contract award until the day of issue of the Certificate of Completion except that the coverage for Completed Operations Liability shall, in any event, be maintained for a period of at least six (6) years beyond the date of the CERTIFICATE OF COMPLETION.

IN3 AUTOMOBILE INSURANCE

IN3.1 Scope of Policy

- 1) Automobile Liability Insurance in respect of licensed vehicles shall have limits of not less than one million dollars inclusive per occurrence for bodily injury, death, and damage to property.



BID AND ACCEPTANCE FORM (BA)

BA01 IDENTIFICATION

Short Circuit Correction
CEF Ottawa, Building 20
Solicitation # 14-1264
Project: CEF14-0025

BA02 BUSINESS NAME AND ADDRESS OF BIDDER

Name: _____

Address: _____

Telephone: _____

Email: _____

Fax: _____

PBN: _____

BA03 THE OFFER

The Bidder offers to Her Majesty the Queen in right of Canada to perform and complete the Work for the above named project in accordance with the Bid Documents for the **Total Bid Amount** of \$ _____ excluding Applicable Taxes.
(amount in numbers)

BA04 BID VALIDITY PERIOD

The bid shall not be withdrawn for a period of 30 days following the date of solicitation closing.

BA05 ACCEPTANCE AND CONTRACT

Upon acceptance of the Contractor's offer by Canada, a binding Contract shall be formed between Canada and the Contractor. The documents forming the Contract shall be the contract documents identified in Contract Documents (CD).

BA06 CONSTRUCTION TIME

The Contractor shall perform and complete the Work within **16 weeks** from the date of notification of acceptance of the offer.

BA07 SIGNATURE

Name and title of person authorized to sign on behalf of Bidder (Type or print)

Signature

Date



SECURITY REQUIREMENTS CHECK LIST (SRCL)
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE

1. Originating Government Department or Organization / Ministère ou organisme gouvernemental d'origine AAFC		2. Branch or Directorate / Direction générale ou Direction CBM	
3. a) Subcontract Number / Numéro du contrat de sous-traitance N/A		3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant N/A	
4. Brief Description of Work / Brève description du travail Short Circuit Correction, building 20. Correction des courts-circuits, édifice 20.			
5. a) Will the supplier require access to Controlled Goods? Le fournisseur aura-t-il accès à des marchandises contrôlées?		<input checked="" type="checkbox"/> No Non <input type="checkbox"/> Yes Oui	
5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations? Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques?		<input checked="" type="checkbox"/> No Non <input type="checkbox"/> Yes Oui	
6. Indicate the type of access required / Indiquer le type d'accès requis			
6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS? (Specify the level of access using the chart in Question 7. c) (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c)		<input checked="" type="checkbox"/> No Non <input type="checkbox"/> Yes Oui	
6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé.		<input type="checkbox"/> No Non <input checked="" type="checkbox"/> Yes Oui	
6. c) Is this a commercial courier or delivery requirement with no overnight storage? S'agit-il d'un contrat de messagerie ou de livraison commerciale sans entreposage de nuit?		<input checked="" type="checkbox"/> No Non <input type="checkbox"/> Yes Oui	
7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès			
Canada <input type="checkbox"/>		NATO / OTAN <input type="checkbox"/>	
Foreign / Étranger <input type="checkbox"/>			
7. b) Release restrictions / Restrictions relatives à la diffusion			
No release restrictions Aucune restriction relative à la diffusion <input type="checkbox"/>		All NATO countries Tous les pays de l'OTAN <input type="checkbox"/>	
Not releasable À ne pas diffuser <input type="checkbox"/>		No release restrictions Aucune restriction relative à la diffusion <input type="checkbox"/>	
Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : <input type="checkbox"/>		Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : <input type="checkbox"/>	
7. c) Level of information / Niveau d'information			
PROTECTED A <input type="checkbox"/> PROTÉGÉ A		NATO UNCLASSIFIED <input type="checkbox"/> NATO NON CLASSIFIÉ	
PROTECTED B <input type="checkbox"/> PROTÉGÉ B		NATO RESTRICTED <input type="checkbox"/> NATO DIFFUSION RESTREINTE	
PROTECTED C <input type="checkbox"/> PROTÉGÉ C		NATO CONFIDENTIAL <input type="checkbox"/> NATO CONFIDENTIEL	
CONFIDENTIAL <input type="checkbox"/> CONFIDENTIEL		NATO SECRET <input type="checkbox"/> COSMIC TOP SECRET	
SECRET <input type="checkbox"/> SECRET		COSMIC TRÈS SECRET <input type="checkbox"/>	
TOP SECRET <input type="checkbox"/> TRÈS SECRET			
TOP SECRET (SIGINT) <input type="checkbox"/> TRÈS SECRET (SIGINT)			
		PROTECTED A <input type="checkbox"/> PROTÉGÉ A	
		PROTECTED B <input type="checkbox"/> PROTÉGÉ B	
		PROTECTED C <input type="checkbox"/> PROTÉGÉ C	
		CONFIDENTIAL <input type="checkbox"/> CONFIDENTIEL	
		SECRET <input type="checkbox"/> SECRET	
		TOP SECRET <input type="checkbox"/> TRÈS SECRET	
		TOP SECRET (SIGINT) <input type="checkbox"/> TRÈS SECRET (SIGINT)	



PART A (continued) / PARTIE A (suite)

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets?
Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS? ☒ No / Non ☐ Yes / Oui

If Yes, indicate the level of sensitivity:

Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets?
Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate? ☒ No / Non ☐ Yes / Oui

Short Title(s) of material / Titre(s) abrégé(s) du matériel :

Document Number / Numéro du document :

PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis



RELIABILITY STATUS
COTE DE FIABILITÉ



CONFIDENTIAL
CONFIDENTIEL



SECRET
SECRET



TOP SECRET
TRÈS SECRET



TOP SECRET- SIGINT
TRÈS SECRET - SIGINT



NATO CONFIDENTIAL
NATO CONFIDENTIEL



NATO SECRET
NATO SECRET



COSMIC TOP SECRET
COSMIC TRÈS SECRET



SITE ACCESS
ACCÈS AUX EMPLACEMENTS

Special comments:

Commentaires spéciaux : _____

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.

REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

10. b) May unscreened personnel be used for portions of the work?
Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail? ☒ No / Non ☐ Yes / Oui

If Yes, will unscreened personnel be escorted?

Dans l'affirmative, le personnel en question sera-t-il escorté?

☐ No / Non ☐ Yes / Oui

PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises?
Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS? ☒ No / Non ☐ Yes / Oui

11. b) Will the supplier be required to safeguard COMSEC information or assets?
Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC? ☒ No / Non ☐ Yes / Oui

PRODUCTION

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises?
Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ? ☒ No / Non ☐ Yes / Oui

INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data?
Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS? ☒ No / Non ☐ Yes / Oui

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency?
Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale? ☒ No / Non ☐ Yes / Oui



PART C - (continued) / PARTIE C - (suite)

For users completing the form **manually** use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.

Les utilisateurs qui remplissent le formulaire **manuellement** doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form **online** (via the Internet), the summary chart is automatically populated by your responses to previous questions.

Dans le cas des utilisateurs qui remplissent le formulaire **en ligne** (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

Category Catégorie	PROTECTED PROTÉGÉ			CLASSIFIED CLASSIFIÉ			NATO				COMSEC					
	A	B	C	CONFIDENTIAL	SECRET	TOP SECRET	NATO RESTRICTED	NATO CONFIDENTIAL	NATO SECRET	COSMIC TOP SECRET	PROTECTED PROTÉGÉ			CONFIDENTIAL	SECRET	TOP SECRET
				CONFIDENTIEL	TRÈS SECRET	NATO DIFFUSION RESTREINTE	NATO CONFIDENTIEL		COSMIC COSMIC TRÈS SECRET	A	B	C	CONFIDENTIEL		TRÈS SECRET	
Information / Assets Renseignements / Biens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IT Media / Support TI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IT Link / Lien électronique	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?
La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

☒ No
Non

☐ Yes
Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".

Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?
La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

☒ No
Non

☐ Yes
Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).

Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquer qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).



PART D - AUTHORIZATION / PARTIE D - AUTORISATION

13. Organization Project Authority / Chargé de projet de l'organisme

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature
Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel
		Date

14. Organization Security Authority / Responsable de la sécurité de l'organisme

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature
Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel
		Date

15. Are there additional instructions (e.g. Security Guide, Security Classification Guide) attached?

Des instructions supplémentaires (p. ex. Guide de sécurité, Guide de classification de la sécurité) sont-elles jointes?

☐ No ☐ Yes
Non Oui

16. Procurement Officer / Agent d'approvisionnement

Name (print) - Nom (en lettres moulées) Jean-Pierre Simard	Title – Titre Senior Contracts Officer	Signature
Telephone No. - N° de téléphone 613 759-6157	Facsimile No. - N° de télécopieur 613 759-7005	E-mail address - Adresse courriel jean-pierre.simard@agr.gc.ca
		Date

17. Contracting Security Authority / Autorité contractante en matière de sécurité

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature
Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel
		Date



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada

DRAWINGS AND SPECIFICATIONS

#14-1264

FOR

SHORT CIRCUIT CORRECTION

Building 20

Project: CEF14-0025

CENTRAL EXPERIMENTAL FARM (CEF)

Agriculture and Agri-Food Canada (AAFC)

960 Carling Avenue

Ottawa, Ontario K1A 0C6

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Part 1 General

1.1 MINIMUM STANDARDS

- .1 Materials shall be new and work shall conform to the minimum applicable standards of the Canadian General Standards Board, the Canadian Standards Association, the National Building Code of Canada 2010 (NBC) and all applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirement shall apply.

1.2 SHOP DRAWINGS

- .1 Submit for the Departmental Representative's review, five (5) copies of each shop drawing.
- .2 The review is for the sole purpose of ascertaining conformance with the general design concept, and does not mean approval of the design details inherent in the shop drawings, responsibility for which shall remain with the Contractor. Such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents.
- .3 Do not commence manufacture or order materials before shop drawings are reviewed.

1.3 SAMPLES

- .1 Samples: examples of materials, equipment, quality, finishes, workmanship.
- .2 Where colour, pattern or texture is criterion, submit full range of samples.
- .3 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.

1.4 PRODUCT DATA

- .1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
- .2 Submit five (5) copies of product data.
- .3 Delete information not applicable to project.
- .4 Cross-reference product data information to applicable portions of Contract Documents.

1.5 TAXES

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

1.6 FEES, PERMITS AND CERTIFICATES

- .1 Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance certificates. Provide inspection certificates as evidence that work conforms to requirements of Authority having jurisdiction.

1.7 FIRE SAFETY REQUIREMENTS

- .1 Comply with the National Building Code of Canada 2010 (NBC) for fire safety in construction and the National Fire Code of Canada 2010 (NFC) for fire prevention, fire fighting and life safety in building in use.
- .2 Comply with Human Resources Development Canada (HRDC), Fire Commissioner of Canada (FCC) standards:
 - .1 No. 301: Standard for Construction Operations.
 - .2 No. 302: Standard for Welding and Cutting.
 - .3 No. 374: Fire Protection Standard for General Storage (Indoor and Outdoor).
 - .4 Retain all fire safety documents and standards on site.
- .3 Welding and cutting:
 - .1 Before welding, soldering, grinding and/or cutting work, obtain a permit from the Fire Prevention Unit as directed by the Departmental Representative. Store flammable liquids in approved CSA containers inspected by the Fire Prevention Unit. No open flame shall be used unless authorized by the Fire Prevention Unit.
 - .2 At least 48 hours prior to commencing cutting, welding or soldering procedure, provide to Departmental Representative:
 - .1 Notice of intent, indicating devices affected, time and duration of isolation or bypass.
 - .2 Completed welding permit as defined in FC 302.
 - .3 Return welding permit to Departmental Representative immediately upon completion of procedures for which permit was issued.
 - .3 A fire watcher as described in FC 302 shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 10m may be ignited by conduction or radiation.
 - .4 Where work requires interruption of fire alarms or fire suppression, extinguishing or protection systems:
 - .1 Provide watchman service as described in FC 301; In general, watchman service is defined as an individual conversant with Fire Emergency Procedures, performing fire picket duty within an unprotected and unoccupied (no workers) area once per hour.
 - .2 Retain services of manufacturer for fire protection systems on daily basis or as approved by FCC, to isolate and protect all devices relating to:
 - .1 modification of fire alarms, fire suppression, extinguishing or protection systems; and/or
 - .2 cutting, welding, soldering or other construction activities which might activate fire protection systems.
 - .5 Immediately upon completion of work, restore fire protection systems to normal operation and verify that all devices are fully operational.

- .6 Inform fire alarm system monitoring agency and local Fire Department immediately prior to isolation and immediately upon restoration of normal operation.

1.8 FIELD QUALITY CONTROL

- .1 Carry out Work using qualified licensed workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.
- .2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licensed workers.
- .3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.

1.9 HAZARDOUS MATERIALS

- .1 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of Material Safety Data Sheets (MSDS) acceptable to Human Resources Development Canada, Labour Program.
- .2 For work in occupied buildings give the Departmental Representative 48 hours notice for work involving designated substances (Ontario Bill 208), hazardous substances (Canada Labour Code Part II Section 10), and before painting, caulking, or using adhesives.

1.10 TEMPORARY UTILITIES

- .1 Existing services required for work may be used by the Contractor without charge. Ensure capacity is adequate prior to imposing additional loads. Connect and disconnect at own expense and responsibility.
- .2 Connect to existing power supply in accordance with Canadian Electrical Code.
- .3 Notify the Departmental Representative and utility companies of intended interruption of services, obtain requisite permission.
- .4 Give the Departmental Representative 48 hours notice related to each necessary interruption of any mechanical or electrical service throughout the course of the work. Keep duration of these interruptions to a minimum. Carry out all interruptions after normal working hours of the occupants, preferably on weekends.

1.11 REMOVED MATERIALS

- .1 Unless otherwise specified, materials for removal become the Contractor's property and shall be taken from site.

1.12 PROTECTION

- .1 Protect finished work against damage until take-over.
- .2 Protect adjacent work against the spread of dust and dirt beyond the work areas.
- .3 Protect operatives and other users of site from all hazards.

1.13 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to the normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated. Refer to article 1.28 Scheduling below for work that must be done during "off hours".
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provides temporary means to maintain security.
- .4 Where elevators, dumbwaiters, conveyors or escalators exist Contractor may use these at Departmental Representative's discretion. Protect from damage, safety hazards and overloading of existing equipment.
- .5 Closures: Protect work temporarily until permanent enclosures completed.

1.14 SITE STORAGE

- .1 The Departmental Representative will assign storage space which shall be equipped and maintained by the Contractor.
- .2 Do not unreasonably encumber site with materials or equipment.
- .3 Move stored products or equipment which interferes with operations of Building System Technician or other contractors.
- .4 Obtain and pay for use of additional storage or work areas needed for operations.

1.15 CUT, PATCH and MAKE GOOD

- .1 Cut existing surfaces as required to accommodate new work.
- .2 Remove all items so shown or specified.
- .3 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative's approval. Match existing material, colour, finish and texture.
- .4 Install firestops and smoke seals in accordance with "ULC-S115-05 – Standard Method of Fire Test of Firestop Systems", around pipe, ductwork, cables and other objects penetrating fire separations to provide fire resistance not less than the fire resistance rating of surrounding floor, ceiling and wall assembly.

1.16 EXAMINATION

- .1 Examine site and conditions likely to affect work and be familiar and conversant with existing conditions.

1.17 SIGNS

- .1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, and etcetera, in both official languages or by the use of commonly-understood graphic symbols to the Departmental Representative's approval.
- .2 No advertising will be permitted on this project.

1.18 ACCESS AND EGRESS

- .1 Designs, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.19 SCAFFOLDS AND WORK PLATFORMS

- .1 Designs, install, and inspect scaffolds and work platforms required for work in accordance with relevant municipal, provincial and other regulations.
- .2 Provide design drawings, signed and sealed by qualified Professional Engineer licensed in the province of Ontario, where prescribed.
- .3 Additions or modifications to scaffolding must be approved by Professional Engineer in writing.

1.20 PUBLIC WAY PROTECTION

- .1 Designs, erect and maintain hoarding and covered pedestrian walkways to support all loads including stairs, runways, ramps or ladders, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.21 WASTE MANAGEMENT

- .1 Comply with the Environmental Protection Act, Ontario Regulations O.Reg. 102/94 and O. Reg. 103/94 for waste management program on construction and demolition projects.
- .2 Provide a "source separation program" to disassemble and collect in an orderly fashion "materials designated for alternative disposal" from the "general waste" stream.
- .3 Submit complete records of all removals from site for both "materials designated for alternative disposal" and "general waste" including:
 - .1 Time and date of removal.
 - .2 Description of material and quantities.
 - .3 Proof that materials have been received at an Approved Waste Processing Site or certified Waste Disposal Site as required.

1.22 RECORDS

- .1 As work progresses, maintain accurate records to show deviations from contract drawings. Just prior to Departmental Representative's inspection for issuance of final certificate of completion, supply to the Departmental Representative one (1) set of white prints with all deviations neatly inked in. The Departmental Representative will provide two sets of clean white prints for this purpose.

1.23 GUARANTEES AND WARRANTIES

- .1 Before completion of work collects all manufacturer's guarantees and warranties and deposit with Departmental Representative.

1.24 CLEAN UP

- .1 Clean up work area as work progresses. At the end of each work period and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.
- .2 Upon completion removes scaffolding, temporary protection and surplus materials. Make good defects noted at this stage.
- .3 Clean manufactured articles in accordance with manufacturer's directions.
- .4 Clean areas under contract to a condition at least equal to that previously existing and to approval of Departmental Representative.

1.25 BUILDING SMOKING ENVIRONMENT

- .1 Smoking is not permitted in the Building. Obey smoking restrictions on building property.

1.26 DUST CONTROL

- .1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of work and public.
- .2 Maintain and relocate protection until such work is complete.
- .3 Protect all furnishings within work area with 0.102mm thick polyethylene film during construction. Remove film during non- construction hours and leave premises in clean, unencumbered and safe manner for normal daytime function.

1.27 TESTING LABORATORY SERVICES

- .1 Departmental Representative will appoint and pay for costs of inspection and testing services, unless indicated otherwise.
- .2 Provide safe working areas and assist with testing procedures, including provisions for materials or services and co-ordination, as required by testing agency and as authorized by Departmental Representative.
- .3 Where tests indicate non-compliance with specifications, contractor to pay for initial test and all subsequent testing of work to verify acceptability of corrected work.

1.28 SCHEDULING

- .1 On award of contract submit bar chart construction schedule for work, indicating anticipated progress stages within time of completion. When schedule has been reviewed by the Departmental Representative, take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.
- .2 Carry out work during "regular hour" Monday to Friday from 07:00 to 18:00 hours and on Saturdays, Sundays and statutory holidays.
- .3 Carry out interior painting in occupied areas during "off hours" Monday to Friday from 18:00 to 07:00 hours and on Saturdays, Sundays, and statutory holidays. Thoroughly ventilate areas painted during "off hours".
- .4 Give the Departmental Representative 48 hours notice for work to be carried out during "off hours".

1.29 COST BREAKDOWN

- .1 Before submitting first progress claim submit breakdown of Contract Amount in detail as directed by Departmental Representative and aggregating the Contract Amount. After approval by Departmental Representative cost breakdown will be used as the basis of progress payments.

1.30 PRECEDENCE

- .1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

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 SECTIONS

- .1 All division 26 sections.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.1-12, Canadian Electrical Code, Part 1 (21st Edition), Safety Standard for Electrical Installations, Includes Update No. 1 (July 2010).
 - .2 CAN/CSA C22.3 No. 1-10, Overhead Systems.
 - .3 CAN3-C235-83(R2010), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
- .2 Electrical and Electronic Manufacturer's Association of Canada (EEMAC)
 - .1 EEMAC 2Y-1-1958, Light Gray Colour for Indoor Switch Gear.
- .3 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
 - .1 IEEE 100(SP1122)-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.
- .4 National Building Code of Canada 2010 (NBC).

1.3 DEFINITIONS

- .1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE 100(SP1122).

1.4 DESIGN REQUIREMENTS

- .1 Operating voltages: to CAN3-C235.
- .2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
 - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
- .3 Language operating requirements: provide identification nameplates and labels for control items in English and French.
- .4 Use one nameplate or label for each language.
- .5 All electrical equipment to be provided with CSA Enclosure Type 2 (Sprinkler Proof) where sprinklers are installed.

1.5 SUBMITTALS

- .1 Shop drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
 - .2 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure co-ordinated installation.
 - .3 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
 - .4 Indicate on drawings clearances for operation, maintenance, and replacement of operating equipment devices.
 - .5 Submit electronic copy of drawings and product data to Project Authority.
 - .6 If changes are required, notify Engineer and Project Authority of these changes before they are made.
 - .7 Shop drawings required for:
 - .1 Distribution Panels.
 - .2 Circuit Breakers.
 - .8 **Short circuit, device evaluation, coordination and arc flash study for the entire central experimental farm campus to be submitted in conjunction with shop drawings.**
- .2 Quality Control:
 - .1 Provide CSA certified equipment and material.
 - .2 Where CSA certified equipment and material is not available from any supplier, submit such equipment and material to inspection authorities for special approval before delivery to site.
 - .3 Submit test results of installed electrical systems and instrumentation.
 - .4 Permits and fees: in accordance with General Conditions of contract.
 - .5 Submit, upon completion of Work, load balance report as described in PART 3 - LOAD BALANCE.
 - .6 Submit certificate of acceptance from inspection authority upon completion of Work to Project Authority.
- .3 Manufacturer's Field Reports: submit to Project Authority manufacturer's written report, within 3 days of review, verifying compliance of Work and electrical system and instrumentation testing, as described in PART 3 - FIELD QUALITY CONTROL.

1.6 QUALITY ASSURANCE

- .1 Qualifications: electrical Work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license or apprentices as per the conditions of Provincial Act respecting manpower vocational training and qualification.
 - .1 Employees registered in provincial apprentices program: permitted, under direct supervision of qualified licensed electrician, to perform specific tasks.
 - .2 Permitted activities: determined based on training level attained and demonstration of ability to perform specific duties.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Material Delivery Schedule: provide Project Authority with schedule within 2 weeks after award of Contract.

1.8 SYSTEM STARTUP

- .1 Instruct Project Authority and operating personnel in operation, care and maintenance of systems, system equipment and components.
- .2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.
- .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.

1.9 OPERATING INSTRUCTIONS

- .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
- .2 Operating instructions to include following:
 - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
 - .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
 - .3 Safety precautions.
 - .4 Procedures to be followed in event of equipment failure.
 - .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.
- .3 Print or engrave operating instructions and frame under glass or in approved laminated plastic.
- .4 Post instructions where directed.
- .5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
- .6 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.10 TRAINING

- .1 Prior to final inspection and after commissioning has been successfully completed, training shall be provided to the Operations and Maintenance personnel.
- .2 Instruct Operations and Maintenance personnel in operation, adjustment and maintenance of equipment and systems, using operation and maintenance data provided as the basis of for instructions. Such instructions and training shall include a sufficient number of demonstrations of all modes of operation of the specialized systems and items of equipment to properly and completely demonstrate that each system and item of equipment is operating as required.
- .3 A minimum of two (2) three (3) hour training session are required.
- .4 Contractor and responsible personnel from the manufacturer or sub-contractor whose Work is being demonstrated shall be present at these demonstrations.
- .5 Provide a minimum of two weeks' notification of demonstration to all parties.

1.11 OPERATION & MAINTENANCE MANUALS

- .1 Provide 3 complete sets of hardcover, index, manuals containing the following:
 - .1 List of manufacturers and suppliers names and phone numbers.
 - .2 Catalogue description of each of the following systems (including comprehensive replacement stock part numbers):
 - .1 Distribution Panels.
 - .2 Circuit Breakers.
 - .3 Copy of operation and user manual(s)
 - .4 Written one year warranty.
 - .5 Final inspection certificate.
 - .6 Wiring, schematic diagrams and performance curves.
 - .7 List of items turned over to Owner.
 - .8 Record of the instruction to the Operations and Maintenance personnel on when, who and which systems the Operations and Maintenance personnel were instructed in. Report shall include date, duration and signature of all attendees.

1.12 WARRANTY

- .1 Provide written warranty for one year (including all materials and labour) on total installation including labour. Warranty to commence upon completed project, or portions of completed work as commissioned into service, prior to the completed project. Such items having been service-requested by either the Consultant or the Owner.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- .1 Material and equipment to be CSA certified. Where CSA certified material and equipment is not available from any manufacturer, obtain special approval from inspection authorities before delivery to site and submit such approval as described in PART 1 - SUBMITTALS.
- .2 Factory assemble control panels and component assemblies.

2.2 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

- .1 Verify installation and co-ordination responsibilities related to motors, equipment and controls, as indicated.

2.3 WARNING SIGNS

- .1 Warning Signs: in accordance with requirements of Authority Having Jurisdiction, inspection authorities and Project Authority.
- .2 Lamicaid signs, minimum size 175 x 250 mm.

2.4 WIRING TERMINATIONS

- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.5 EQUIPMENT IDENTIFICATION

- .1 Identify electrical equipment with nameplates and labels as follows:
 - .1 Nameplates: lamicoid 3 mm thick plastic engraving sheet, black face, white core, lettering accurately aligned and engraved into core, mechanically attached with self tapping screws.
 - .2 Sizes as follows:

NAMEPLATE SIZES

Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

- .2 Labels: embossed plastic labels with 6 mm high letters unless specified otherwise.
- .3 Wording on nameplates and labels to be approved by Project Authority prior to manufacture.
- .4 Allow for minimum of forty (40) letters and two (2) lines.
- .5 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.
- .6 Identify equipment with Size 3 labels engraved "ASSET INVENTORY NO. " as directed by Project Authority.
- .7 Terminal cabinets and pull boxes: indicate system and voltage.
- .8 Transformers: indicate capacity, primary and secondary voltages.

2.6 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, numbered and coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA C22.1.
- .4 Use colour coded wires in communication cables, matched throughout system.

2.7 CONDUIT AND CABLE IDENTIFICATION

- .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 3 m intervals.
- .3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.

System	Prime colour	Auxiliary colour
Low voltage	Brown	
Normal power up to 250 volts	Yellow	
Emergency power up to 250 volts	Yellow	Red
Normal 347/600 volts	Blue	
Emergency 347/600 volts	Blue	Red
Controls	Grey	
Fire alarm	Red	
Voice & Data	Green	
Security	Orange	

2.8 FINISHES

- .1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.
 - .1 Paint outdoor electrical equipment; colour to be determined by Project Authority.
 - .2 Paint indoor switchgear and distribution enclosures light gray to EEMAC 2Y-1.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.
- .2 Do overhead and underground systems in accordance with CSA C22.3 No.1 except where specified otherwise.

3.2 NAMEPLATES AND LABELS

- .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.3 CONDUIT AND CABLE INSTALLATION

- .1 Install conduit and sleeves prior to pouring of concrete.
 - .1 Sleeves through concrete: schedule 40 steel pipe, sized for free passage of conduit, and protruding 50 mm.
- .2 If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.
- .3 Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.

3.4 MOUNTING HEIGHTS

- .1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
- .3 Install electrical equipment at following heights unless indicated otherwise.
 - .1 Local switches: 1200 mm.
 - .2 Wall receptacles:
 - .1 General: 400 mm.
 - .2 Above top of counters or counter splash backs: 175 mm.
 - .3 In mechanical rooms: 1400 mm.
 - .3 Panelboards: as required by Code or as indicated.
 - .4 Telephone and interphone outlets: 400 mm.
 - .5 Wall mounted telephone and interphone outlets: 1200 mm.
 - .6 Fire alarm stations: 1200 mm.
 - .7 Fire alarm bells or horns: 2100 mm.

- .8 Television outlets: 400 mm.
- .9 Wall mounted speakers: 2100 mm.
- .10 Clocks: 2100 mm.
- .11 Door bell pushbuttons: 1200 mm.
- .12 VFD keypad and display centre: 1600mm

3.5 CO-ORDINATION OF PROTECTIVE DEVICES

- .1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.
- .2 Provide short circuit, device evaluation and coordination study for the entire central experimental farm campus in accordance with section 26 57 00 Power System Studies.

3.6 FIELD QUALITY CONTROL AND LOAD BALANCING

- .1 Load Balance:
 - .1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.
 - .2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.
 - .3 Provide upon completion of work, load balance report as directed in PART 1 - SUBMITTALS: phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.
- .2 Conduct following tests:
 - .1 Wires and cables including existing in accordance with Section 26 05 21.
 - .2 Insulation resistance testing:
 - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
 - .2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.
 - .3 Check resistance to ground before energizing.
- .3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- .4 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.7 CLEANING

- .1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.
- .2 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.

3.8 SEISMIC REQUIREMENTS

- .1 Design and construct electrical services and their fastenings and supports in accordance with the 2010 National Building Code of Canada. Design of structural support elements, including connections, shall be carried out by a structural Engineer, engaged by the Contractor and licensed in the province of Ontario, who shall seal and sign the design drawings. The sealed drawings shall be submitted along with the electrical shop drawings for review. The structural Engineer who seals the drawings shall also carry out sufficient on site review of the work to ensure and to certify in writing that the work is in general compliance with his design.
- .2 The objective in providing seismic restraint is to provide for a reasonable level of life safety by concentrating the efforts on restraining heavy equipment in place, maintaining essential life safety related systems and protecting the escape routes from the building.
- .3 Electrical equipment and associated services requiring seismic restraints shall include but not necessarily be limited to the following items. Compare with the drawings and add to the list as applicable:
 - .1 Equipment:
 - .1 All floor mounted, static electrical equipment including but not necessarily limited to the following, shall be suitable anchored and braced to ensure that it does not topple over:
 - .1 Switchboards
 - .2 Motor Control Centers
 - .3 Distribution Panels
 - .4 Transformers
 - .5 Uninterruptible Power Supplies
 - .2 All floor mounted electrical equipment with moving parts such as diesel generator, shall be anchored and provided with vibration isolator and snubber assemblies.

- .2 Escape route requirements: To maintain accessibility in escape routes, the pertinent electrical installations must be seismically restrained. These shall include but not necessarily be limited to:
- .1 Conduit
 - .2 Light fixtures
 - .3 Cable tray
 - .4 Treatment of conduit and light fixtures is to be as already described above.
 - .5 Cable tray is to be securely supported and cross braced to ensure that it stays in place.

END

PART 1 GENERAL

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA C22.2 No.18-98(R2003), Outlet Boxes, Conduit Boxes, and Fittings.
 - .2 CAN/CSA-C22.2 No.65-13, Wire Connectors (Tri-National standard, with UL 486A-486B and NMX-J-543-ANCE-03).
- .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)

1.2 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused wiring materials from landfill to metal recycling facility as approved by Project Authority.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Pressure type wire connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit copper conductors as required.
- .2 Clamps or connectors for armoured cable, mineral insulated cable, flexible conduit, 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 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.

3.2 CLEANING

- .1 Progress Cleaning:
 - .1 Leave work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

END

PART 1 GENERAL

1.1 REFERENCES

- .1 International Electrical Testing Association:
 - .1 ANSI/NETA MTS-2011, Standard for Maintenance Testing Specifications for Electrical Power Equipment and Systems.

1.2 RELATED SECTIONS

- .1 Section 26 05 00 - Common Work Results for Electrical.
- .2 Section 26 05 20 - Wire and Box Connectors - (0-1000 V).
- .3 Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.

1.3 PRODUCT DATA

- .1 Provide product data in accordance with Section 26 05 00 - Common Work Results for Electrical.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding and packaging materials.

PART 2 PRODUCTS

2.1 BUILDING WIRES

- .1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.
- .2 Copper conductors: size as indicated, with 600 V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE, Jacketted.
- .3 Copper conductors: size as indicated, with thermoplastic insulation type TWU for underground in ducts; T90 Nylon for building wiring; rated at 600 V.
- .4 Copper conductors: size as indicated with flame resistant chemically cross-linked polyethylene insulation, rated RHW.

2.2 TECK 90 CABLE

- .1 Cable: in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Conductors:
 - .1 Grounding conductor: copper.
 - .2 Circuit conductors: copper, size as indicated.
- .3 Insulation:
 - .1 Cross-linked polyethylene XLPE.
 - .2 Rating: 600 V.
- .4 Inner jacket: polyvinyl chloride material.
- .5 Armour: interlocking aluminum.
- .6 Overall covering: thermoplastic polyvinyl chloride, compliant to applicable Building Code classification for this project.
- .7 Fastenings:
 - .1 One hole malleable iron, steel, aluminum 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 1 m centres.
 - .3 Threaded rods: 6 mm diameter to support suspended channels.
- .8 Connectors:
 - .1 Watertight, approved for TECK cable.

2.3 CONTROL CABLES

- .1 Type: LVT: 2 soft annealed copper conductors, sized as indicated:
 - .1 Insulation: thermoplastic.
 - .2 Sheath: thermoplastic jacket.
- .2 Type: low energy 300 V control cable: solid annealed copper conductors sized as indicated. LVT: 2 soft annealed copper conductors, sized as indicated:
 - .1 Insulation: polyethylene.
 - .2 Shielding: tape coated with paramagnetic material braid over each conductor.
 - .3 Overall covering: polyethylene jackets.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

- .1 Visual and Mechanical Inspection:
 - .1 Inspect conductors for physical damage.
 - .2 Inspect all bolted electrical connections for high resistance using low-resistance ohmmeter or calibrated torque-wrench method, in accordance with manufacturer's published data or as per NETA MTS-2011.
 - .3 Inspect compression-applied connectors for correct cable match and indentation.
- .2 Electrical Tests
 - .1 Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable. Investigate any values that deviate from those of similar bolted connections by more than 50% of the lowest value.
- .3 Test Report
 - .1 Submit test report complete with comments on condition of existing wires and cables to Project Authority for review.

3.2 GENERAL CABLE INSTALLATION

- .1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (01000 V).
- .2 Cable Colour Coding: to Section 26 05 00 Common Work Results for Electrical.
- .3 Conductor length for parallel feeders to be identical.
- .4 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.
- .5 Wiring in walls: typically drop or loop vertically from above to better facilitate future renovations. Generally wiring from below and horizontal wiring in walls to be avoided unless indicated.
- .6 Provide numbered wire collars for control wiring. Numbers to correspond to control shop drawing legend. Obtain wiring diagram for control wiring.

3.3 INSTALLATION OF BUILDING WIRES

- .1 Install wiring as follows:
 - .1 In conduit systems in accordance with Section 26 05 34 - Conduits, Conduit Fittings and Conduit Fittings.

3.4 INSTALLATION OF TECK 90 CABLE (0 -1000 V)

- .1 Use Teck 90 for final flexible connections at motors and equipment. **Teck cable is to be used for final connections of equipment.**
- .2 Group cables wherever possible on channels.
- .3 Install cable exposed, securely supported by straps and hangers.

END

PART 1 GENERAL

1.1 RELATED SECTIONS

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

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.2 No.41-13, Grounding and Bonding Equipment.

1.3 PRODUCT DATA

- .1 Submit product data in accordance with Section 26 05 00 – Common Work Results for Electrical.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Project Authority.

PART 2 PRODUCTS

2.1 CONNECTORS AND TERMINATIONS

- .1 Copper long barrel compression connectors to CSA C22.2 No. 41 as required sized for conductors.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Bond and ground as required to CSA C22.2 No.41.

END

PART 1 GENERAL

1.1 RELATED SECTIONS

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

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)
 - .1 ANSI/IEEE 837-2002, IEEE Standard for Qualifying Permanent Connections Used in Substation Grounding.
- .2 Canadian Standards Association, (CSA International)
 - .1 CSA Z32-09, Electrical Safety and Essential Electrical Systems in Health Care Facilities, Includes Update No. 1 (2010), Update No. 2 (2010)

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility as approved by Project Authority.
- .5 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 PRODUCTS

2.1 EQUIPMENT

- .1 Clamps for grounding of conductor: size as required.
- .2 Grounding conductors: bare stranded copper, tinned, soft annealed, size as indicated.
- .3 Insulated grounding conductors: green, type RW90.

- .4 Non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:
 - .1 Grounding and bonding bushings.
 - .2 Protective type clamps.
 - .3 Bolted type conductor connectors.
 - .4 Thermit welded type conductor connectors.
 - .5 Bonding jumpers, straps.
 - .6 Pressure wire connectors.

PART 3 EXECUTION

3.1 INSTALLATION GENERAL

- .1 Install complete permanent, continuous grounding system including, electrodes, conductors, connectors, accessories. Where EMT is used, run ground wire in conduit.
- .2 Install connectors in accordance with manufacturer's instructions.
- .3 Protect exposed grounding conductors from mechanical injury.
- .4 Use mechanical connectors for grounding connections to equipment provided with lugs.
- .5 Soldered joints not permitted.
- .6 Install bonding wire for flexible conduit, connected at both ends to grounding bushing, solderless lug, clamp or cup washer and screw. Neatly cleat bonding wire to exterior of flexible conduit.
- .7 Connect building structural steel and metal siding to ground by welding copper to steel.
- .8 Make grounding connections in radial configuration only, with connections terminating at single grounding point. Avoid loop connections.
- .9 Bond single conductor, metallic armoured cables to cabinet at supply end, and provide non-metallic entry plate at load end.

3.2 EQUIPMENT GROUNDING

- .1 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, transformers, switchgear, duct systems, frames of motors, motor control centres, starters, and control panels.

3.3 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of Project Authority and local Authority Having Jurisdiction over installation.
- .3 Perform tests before energizing electrical system.
- .4 Disconnect ground fault indicator during tests.

END

PART 1 GENERAL

1.1 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility as approved by Project Authority.
- .5 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 PRODUCTS

2.1 SUPPORT CHANNELS

- .1 U shape, size 41 x 41 mm, 2.5 mm thick, surface mounted and suspended.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Secure equipment to solid masonry, tile and plaster surfaces with nylon shields.
- .2 Secure equipment to poured concrete with expandable inserts.
- .3 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.
- .4 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.
- .5 Fasten exposed conduit or cables to building construction or support system using straps.
 - .1 One-hole steel straps to secure surface conduits and cables 50 mm and smaller.
 - .2 Two-hole steel straps for conduits and cables larger than 50 mm.
 - .3 Beam clamps to secure conduit to exposed steel work.
- .6 Suspended support systems.

- .1 Support individual cable or conduit runs with 6 mm dia threaded rods and spring clips.
- .2 Support 2 or more cables or conduits on channels supported by 6 mm dia threaded rod hangers where direct fastening to building construction is impractical.
- .7 For surface mounting of two or more conduits use channels at 1 m on centre spacing.
- .8 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.
- .9 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.
- .10 Do not use wire lashing or perforated strap to support or secure raceways or cables.
- .11 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of Project Authority.
- .12 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.
- .13 Fasten electrical supports only to steel structure. Do not fasten electrical supports to underside of steel deck.

END

PART 1 GENERAL

1.1 RELATED SECTIONS

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

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.1-12, Canadian Electrical Code, Part 1 (21st Edition), Safety Standard for Electrical Installations, Includes Update No. 1 (July 2010).

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Provide shop drawings: in accordance with Section 26 05 00 - Common Work Results for Electrical.
 - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling.

PART 2 PRODUCTS

2.1 SPLITTERS

- .1 Construction: sheet metal enclosure, welded corners and formed hinged cover suitable for locking in closed position.
- .2 Terminations: main and branch lugs to match required size and number of incoming and outgoing conductors as indicated.
- .3 Spare Terminals: minimum three spare terminals or lugs on each connection or lug block sized less than 400 A.

2.2 JUNCTION AND PULL BOXES

- .1 Construction:welded steel enclosure.
- .2 Covers Flush Mounted: 25 mm minimum extension all around.
- .3 Covers Surface Mounted: screw-on flat covers.

PART 3 EXECUTION

3.1 SPLITTER INSTALLATION

- .1 Mount plumb, true and square to building lines.
- .2 Extend splitters full length of equipment arrangement except where indicated otherwise.

3.2 JUNCTION AND PULL BOXES INSTALLATION

- .1 Install pull boxes in inconspicuous but accessible locations.
- .2 Only main junction and pull boxes are indicated. Install additional pull boxes as required by CSA C22.1.

3.3 IDENTIFICATION

- .1 Equipment Identification: to Section 26 05 00 - Common Work Results for Electrical.
- .2 Identification Labels: size 2 indicating system name, voltage and phase or as indicated.

END

PART 1 GENERAL

1.1 RELATED SECTIONS

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

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.
 - .2 CSA C22.2 No. 56-04(R2009), Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
 - .3 CSA C22.2 No. 83-M1985(R2013), Electrical Metallic Tubing.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 26 05 00 – Common Work Results for Electrical.
- .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 and recycling.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.

PART 2 PRODUCTS

2.1 CABLES AND REELS

- .1 Provide cables on reels or coils.
 - .1 Mark or tag each cable and outside of each reel or coil, to indicate cable length, voltage rating, conductor size, and manufacturer's lot number and reel number.
- .2 Each coil or reel of cable to contain only one continuous cable without splices.
- .3 Identify cables for exclusively dc applications.

2.2 CONDUITS

- .1 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings.
- .2 Flexible metal conduit: to CSA C22.2 No. 56, liquid-tight flexible metal.

2.3 CONDUIT FASTENINGS

- .1 One hole steel straps to secure surface conduits 50 mm and smaller.
 - .1 Two hole steel straps for conduits larger than 50 mm.
- .2 Beam clamps to secure conduits to exposed steel work.
- .3 Channel type supports for two or more conduits at 1 m on centre.
- .4 Threaded rods, 6 mm diameter, to support suspended channels.
- .5 Conduit to be supported by structural steel and open web steel joists.

2.4 CONDUIT FITTINGS

- .1 Fittings: 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 Steel set screw connectors for EMT.

2.5 EXPANSION FITTINGS FOR RIGID CONDUIT

- .1 Weatherproof expansion fittings with internal bonding assembly suitable for 200 mm linear expansion.
- .2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection.
- .3 Weatherproof expansion fittings for linear expansion at entry to panel.

2.6 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 Conceal conduits except in mechanical and electrical service rooms, in unfinished areas.
- .3 Use electrical metallic tubing (EMT) except in cast concrete.
- .4 Use flexible metal conduit for connection to motors in dry areas, connection to surface or recessed fluorescent fixtures, work in movable metal partitions.
- .5 Use liquid tight flexible metal conduit for connection to motors or vibrating equipment in damp, wet or corrosive locations.
- .6 Minimum conduit size for lighting and power circuits: 19 mm.
- .7 Bend conduit cold:
 - .1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.
- .8 Mechanically bend steel conduit over 19 mm diameter.
- .9 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.

- .10 Install fish cord in empty conduits.
- .11 Remove and replace blocked conduit sections.
 - .1 Do not use liquids to clean out conduits.
- .12 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 CONCEALED CONDUITS

- .1 Run parallel or perpendicular to building lines.
- .2 Do not install horizontal runs in masonry walls.
- .3 Do not install conduits in terrazzo or concrete toppings.

3.5 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END

PART 1 GENERAL

1.1 RELATED REQUIRMENTS

- .1 Section 26 28 16.02 Molded Case Circuit Breakers

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 26 05 00 Common Work Results for Electrical.
- .2 Product Data:
Submit manufacturer's instructions, printed product literature and data sheets for panelboards and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
Include on drawings:
 - .1 Electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 26 05 00 Common Work Results for Electrical.
- .2 Operation and Maintenance Data: submit operation and maintenance data for panelboards for incorporation into manual.

1.4 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:
Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area. Store and protect panelboards from nicks, scratches, and blemishes. Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 PANELBOARDS

- .1 Panelboards: to CSA C22.2 No.29 and product of one manufacturer.
Install circuit breakers in panelboards before shipment.
In addition to CSA requirements manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.
- .2 600 V panelboards: bus and breakers rated as indicated on drawings.
- .3 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.
- .4 Panelboards: mains, number of circuits, and number and size of branch circuit breakers as indicated.
- .5 Minimum of 2 flush locks for each panel board.
- .6 Two keys for each panelboard and key panelboards alike.
- .7 Tin-plated copper bus with neutral of double ampere rating of mains.
- .8 Mains: suitable for bolt-on breakers.
- .9 Trim with concealed front bolts and hinges.
- .10 Trim and door finish: baked enamel as per colour schedule.
- .11 Include grounding busbar with 3 of terminals for bonding conductor equal to breaker capacity of the panel board.

2.2 BREAKERS

- .1 Breakers: to Section 26 28 16.02 - Moulded Case Circuit Breakers.
- .2 Breakers with thermal and magnetic tripping in panelboards except as indicated otherwise.

2.3 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Nameplate for each panelboard size 4 engraved as indicated.

- .3 Nameplate for each circuit in distribution panelboards size 2 engraved as indicated.
- .4 Complete circuit directory with typewritten legend showing location and load of each circuit, mounted in plastic envelope at inside of panel door.

PART 3 EXECUTION

2.1 INSTALLATION

- .1 Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.
- .2 Connect loads to circuits.

3.2 CLEANING

- .1 Progress Cleaning: Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.3 PROTECTION

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

END

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 24 16.01 Panelboards Breaker Type

1.2 REFERENCES

- .1 .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 NMJ-J-266-ANCE-2010).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 26 05 00 Common Work Results for Electrical.
- .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 Include time-current characteristic curves for breakers with ampacity of 400 A and over.
- .4 Certificates:
 - .1 Prior to installation of circuit breakers in either new or existing installation, Contractor must submit 3 copies of a production certificate of origin from the manufacturer. Production certificate of origin must be duly signed by factory and local manufacturer's representative certifying that circuit breakers come from this manufacturer and are new and meet standards and regulations.
 - .2 Production certificate of origin must be submitted to Project Authority for approval.

1.4 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 circuit breakers indoors 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 BREAKERS GENERAL

- .1 Moulded-case circuit breakers: to CSA C22.2 No. 5.
- .2 Bolt-on moulded case circuit breaker: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.
- .3 Plug-in moulded case circuit breakers: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.
- .4 Common-trip breakers: with single handle for multi-pole applications.
- .5 Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting.
 - .1 Trip settings on breakers with adjustable trips to range from 3-8 times current rating.
- .6 Circuit breakers with interchangeable trips as indicated.

2.2 THERMAL MAGNETIC BREAKERS

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

2.3 OPTIONAL FEATURES

- .1 Include:
 - .1 On-off locking device.
 - .1 Handle mechanism.

PART 3 EXECUTION

3.1 INSTALLTION

- .1 Install circuit breakers as indicated.

3.2 CLEANING

- .1 Progress Cleaning: Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .3 Waste Management: separate waste materials for reuse and recycling,
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END

PART 1 GENERAL

1.1 RELATED SECTIONS

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

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA Z462-12, Workplace Electrical Safety
- .2 Institute of Electrical and Electronics (IEEE)/
 - .1 IEEE Standard 399-1997, 'IEEE Recommended Practice for Industrial and Commercial Power Systems Analysis,
 - .2 IEEE Standard 242-2001, 'Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems'
 - .3 IEEE Standard 1584-2002, 'IEEE Guide for Performing Arc-Flash Hazard Calculations'.

1.3 DEFINITIONS

- .1 Bus or Busses: This implies an electrically significant node within the distribution system as defined within IEEE Standard 399 and 1584. Typically, this would include, but not be limited to, the following items:
 - .1 Switchgear and Switchboards
 - .2 Panelboards
 - .3 Motor Control Centres
 - .4 Medium-voltage loadbreak and disconnect switches
 - .5 Low-voltage disconnects, enclosed breakers
 - .6 Splitters and junction boxes
 - .7 Motor starters and variable speed drives
 - .8 Transfer switches (normal, emergency and load side busses)
 - .9 Generators and uninterruptible power supplies
 - .10 Transformers (primary and secondary busses)

1.4 SITE INVESTIGATION

- .1 Agriculture and Agri-Food Canada cannot provide complete and detailed records of existing systems, such as drawings, test reports or previous power systems studies. Single-line diagrams are not available for all of the buildings on the Central Experimental Farm campus, and where they are available, they do not contain all of the information required to complete the studies. Therefore, thorough site investigation is required to ascertain the required details of the existing equipment, system and infrastructure. No shutdowns will be permitted to conduct the required site investigation.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Employees The studies shall be prepared by an Engineering, Technical firm, or distribution equipment manufacturer that regularly performs these types of Power Systems Studies.
 - .2 The studies shall be performed or reviewed by a qualified Professional Engineer, licensed to practice in the Province of Ontario.
 - .3 Site Work:
 - .1 All required site work must be completed by two competent, qualified personnel, as defined by CSA Z462.
 - .2 Full Personal Protective Equipment (PPE) must be used when required, including but not limited to helmets, boots, safety glasses, face shields, arc flash suits, gloves, hearing protection, and other equipment suitably rated for the arc flash class, as defined by CSA Z462.
 - .3 All tools shall be fully insulated for the voltage class rating of the switchgear being accessed.
 - .4 All relevant non-contact boundaries must be maintained and appropriate tools shall be used as necessary to obtain all required information without contacting live conductors.

1.6 SOFTWARE

- .1 The power systems studies shall be performed using one of the following programs:
 - .1 SKM Power Tools for Windows
 - .2 ETAP
 - .3 Easy Power
 - .4 CYME

1.7 SYSTEM MODEL

- .1 The Short Circuit Study Model shall include:
 - .1 All existing busses within the Central Experimental Farm campus from the incoming utility supplies in the main substation, down through the medium-voltage distribution system to the low-voltage switchboards, panelboards, splitters, motor control centres, disconnect switches, motor starters, and other distribution equipment.
 - .2 Motors making significant contributions to system fault levels (i.e. > 150HP)
 - .3 All emergency sources, including generators, and emergency distribution
 - .4 All significant sources of impedance, including:
 - .1 utility and emergency sources
 - .2 cables
 - .3 transformers
 - .4 filters and reactors
 - .5 other devices impacting the fault levels.
 - .5 Cable types and sizes shall be visually confirmed. Estimated lengths shall be within 10% of actual.

- .6 Transformer impedances shall be visually confirmed.
- .7 Generators shall be modelled using actual impedances, damage and decrement curves, wherever possible.
- .8 Liason with local supply authority is required in order to confirm fault levels available at the point of utility supply.
- .2 The Device Evaluation Study Model shall include:
 - .1 All of the unique protective devices directly connected to each bus within the scope of the Short Circuit Study, including:
 - .1 Circuit Breakers
 - .2 Motor Circuit Protectors
 - .3 Fuses
 - .4 Switches (withstand rating)
 - .5 Automatic Transfer Switches (withstand rating)
 - .6 Any other devices that may be required to make or break fault and/or load currents.
- .3 The Coordination Study Model shall include:
 - .1 All protective devices directly connected to each bus within the scope of the Short Circuit Study, complete with their existing settings, including:
 - .1 Circuit Breakers
 - .2 Motor Circuit Protectors
 - .3 Fuses
 - .4 Relays
 - .5 Overloads
 - .2 All equipment to be protected by the above-listed devices, including:
 - .1 Transformers
 - .2 Generators
 - .3 Cables
 - .4 Busses
 - .5 Motors
 - .3 Accurate trip curves for all protective devices, obtaining assistance from manufacturers as required.
 - .4 Accurate characteristics and settings for upstream relays, obtaining assistance from supply authority as required.
- .4 The Arc Flash Study Model shall include:
 - .1 All busses within the scope of the Short Circuit Study, with the exception of:
 - .1 Busses supplied by a circuit rated 240V or less, provided the circuit is fed from one transformer rated less than 125kVA.
 - .2 Isolation disconnects at loads that are confirmed to meet the requirements of CSA Z462 default Table 4 Hazard/Risk Categories.
 - .2 Note: busses excluded from model still must be labelled.

1.8 POWER SYSTEMS STUDY REQUIREMENTS

- .1 Short Circuit Study:
 - .1 Document maximum three phase and single line to ground fault currents for each bus.
 - .2 Multiple short circuit studies must be conducted for all applicable system

configurations and modes of operation, including:

- .1 Ultimate, maximum and minimum utility supplies
 - .2 Multiple open points in medium-voltage loops in order to obtain worst-case fault levels throughout.
 - .3 Emergency sources, including single and paralleled generators, where applicable.
- .3 For each short circuit study, the following must be tabulated for each bus:
 - .1 interrupting duty
 - .2 momentary duty
 - .3 RMS symmetrical and asymmetrical short circuit currents
 - .4 X/R ratios
 - .5 source impedance
- .2 Device Evaluation Study:
 - .1 For each evaluated protective device, include the actual and effective maximum fault duty. Actual and effective fault duties may differ depending on the X/R ratio at the bus.
 - .2 Device evaluation reports shall include a list of all busses complete with:
 - .1 Voltage
 - .2 Maximum fault current
 - .3 X/R ratio
 - .4 All unique protective devices with their:
 - .1 Rated voltage
 - .2 Test X/R ratio
 - .3 Fault duty
 - .4 Symmetrical rating
 - .5 Asymmetrical rating (where applicable)
 - .6 Series rating (where applicable)
 - .7 Pass or Fail
- .3 Coordination Study:
 - .1 Provide time-current graphs for all components from the supply authority's protective devices and generator protection down through to the 2 largest protective devices at each bus supplied from a circuit breaker with an adjustable trip unit, either directly or through a transformer.
 - .2 Each building on the campus must be represented in at least one graph, even simple buildings having a small electrical service.
 - .3 Each time-current graph shall be printed in colour on a log log time vs current scale. Multiple colours and/or hatching patterns shall be used to allow the reader to easily discriminate between all devices represented on the graphs.
 - .4 Graphs shall include the following time-current curves, each terminating at the 3 phase symmetrical fault level calculated for the bus:
 - .1 Relay, fuse, static-trip breaker, thermal-magnetic circuit breaker, overload and motor circuit protector curves.
 - .2 Transformer inrush, damage, and overload curves.
 - .3 Cable, bus and conductor damage curves, where applicable.
 - .4 Motor starting curves and associated protective devices for motors larger than 150HP.
 - .5 Each graph should additionally contain:
 - .1 A single-line diagram depicting all of the device curves included in the graph, and how they are interconnected.

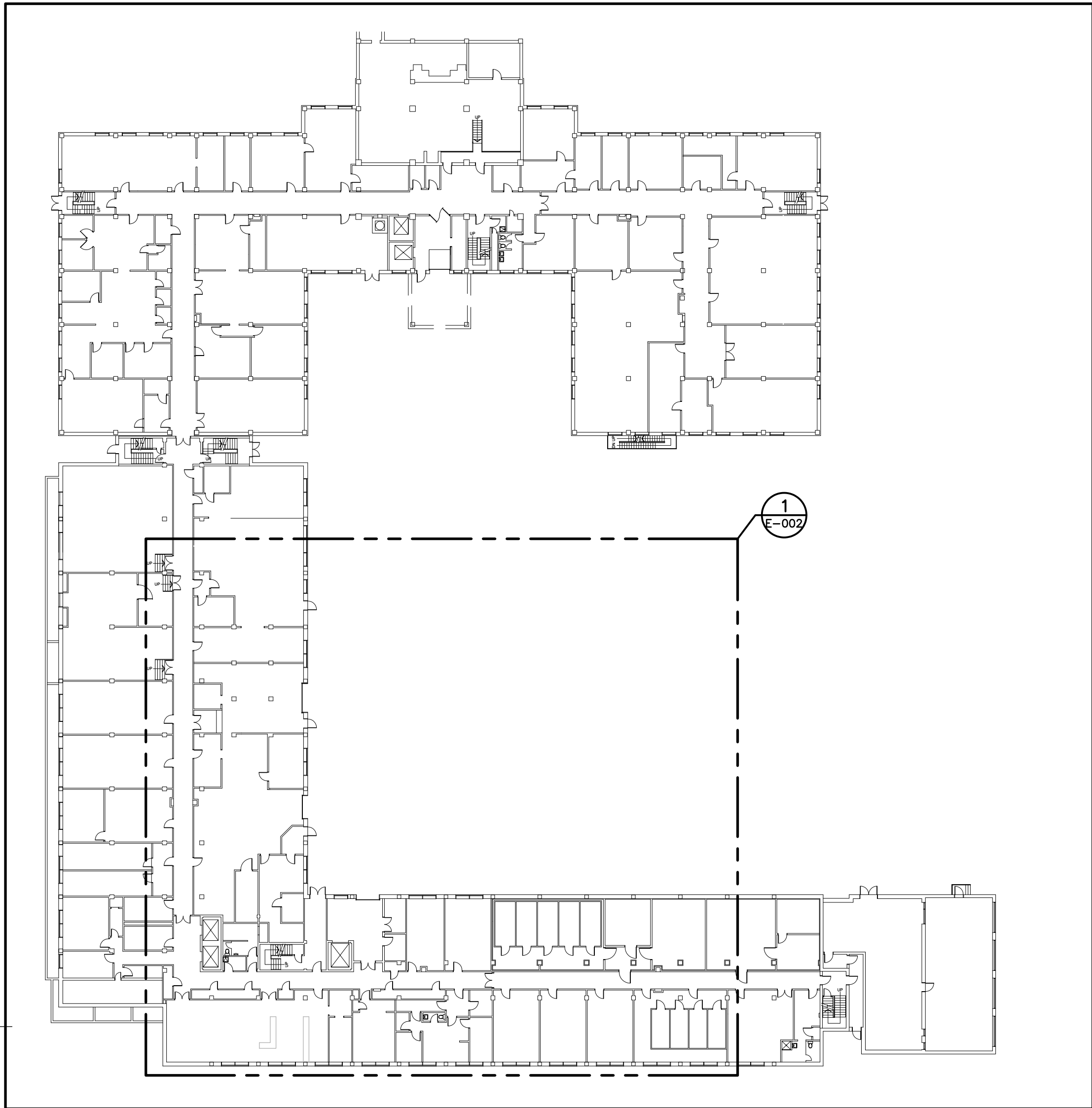
- .2 Protective device details, including make, model, trip unit, ratings, sensor, plug, current-transformer, and settings, as applicable.
- .6 Provide tabulated existing and recommended protective device settings, sorted logically by building, system, substation and electrical room. The location of all protective devices in the tables should be easy to determine, and tables should cross reference coordination graphs in which each protective device is shown.
- .4 Arc Flash Study:
 - .1 Provide arc flash reports for all applicable system operation scenarios including, for each bus requiring detailed calculations under IEEE 1584:
 - .1 Incident energy level
 - .2 Arcing current
 - .3 Interrupting time
 - .4 Flash protection boundary
 - .5 Hazard/Risk category level
 - .2 Provide detailed IEEE 1584 labels as per CSA Z462 Annex Q.4.
 - .3 If using Table 4 methods for local isolation disconnects at loads, provide an Adobe Acrobat file providing the default CSA Z462 Table 4 label(s). Modified CSA Z462 Table 4 labels to include information as per CSA Z462 Table 4 for each type of switchgear element.
- .5 Single-Line Diagram(s):
 - .1 Provide single-line diagram(s) extracted from the software program used to perform the power systems studies. Scale and quantity of drawing(s) to be chosen so that device details are clear and legible. Drawings to contain:
 - .1 Transformer ratings, including primary and secondary voltages, rated kVA and impedance.
 - .2 Cable and bus duct sizes/ratings and lengths.
 - .3 Bus names and nominal voltages.
 - .4 Protective device names, make, model and frame/trip ratings.
 - .5 Utility and generator parameters.
- .6 Final Report:
 - .1 Shall contain all required information from Short Circuit, Device Evaluation, Coordination and Arc Flash Studies, as listed above.
 - .2 Report shall be submitted in Adobe Acrobat (pdf) format to the Engineer for review in conjunction with the shop drawings for the project. Shop drawings for new distribution equipment will not be reviewed or released until the final report is completed to the satisfaction of the Engineer and the Project Authority.
 - .3 A review of the report shall be conducted by the Engineer and Project Authority. A formal written response to their comments shall be provided. If required, upon agreement of all parties, modifications to the report will be carried out, after which, the final report shall be published.
 - .4 Five (5) hardcopies of the final report shall be provided in binders.
 - .5 Five (5) CD's or DVD's shall be provided containing the complete report in Adobe Acrobat (pdf) format.

PART 2 PRODUCTS

2.1 ARC FLASH AND SHOCK WARNING LABELS

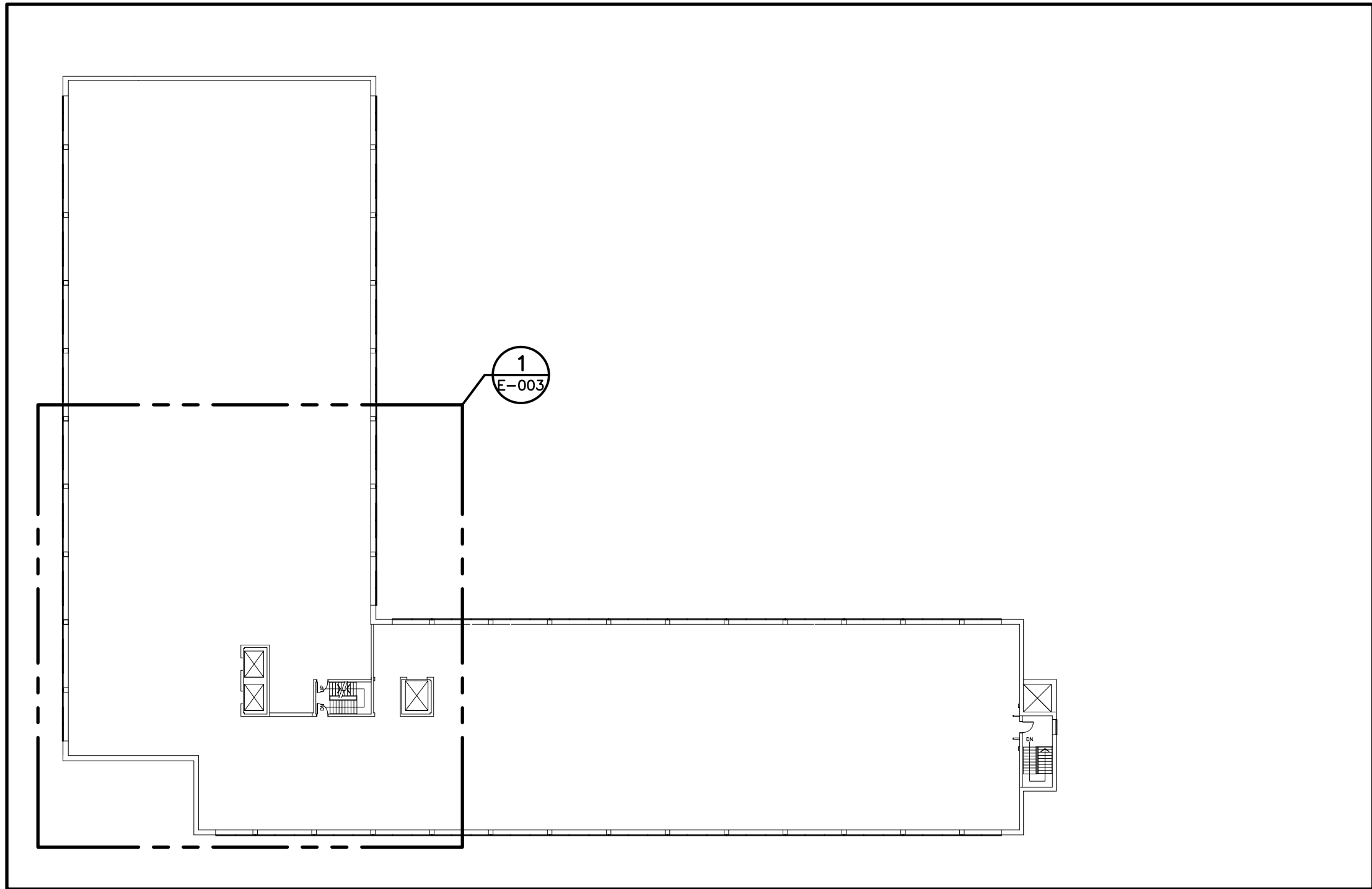
- .1 Provide shock and arc flash warning labels and affix on all busses within the campus and buildings.
 - .1 All labels to be done in both English and French.
 - .2 Free-standing multi-cell switchgear and motor control centres to be provided with labels for the front and rear of each cell.
- .2 Labels to be:
 - .1 Self-adhesive, polyester.
 - .2 UV rated (suitable for installation outdoors)
 - .3 Printed using thermal transfer method.
 - .4 No handwritten labels will be permitted.

END



BASEMENT KEY PLAN
PLAN REPÈRE DU SOUS-SOL

1
E-001
1:400
0 4m 8m 12m 20m



PENTHOUSE KEY PLAN
PLAN REPÈRE DE L'APPENTIS

2
E-001
1:400
0 4m 8m 12m 20m

DRAWING LIST

E-001	K.W. NEATBY BUILDING – KEY PLANS, GENERAL NOTES & LEGEND
E-002	K.W. NEATBY BUILDING – PARTIAL BASEMENT PLAN DEMOLITION / NEW
E-003	K.W. NEATBY BUILDING – PARTIAL PENTHOUSE PLAN DEMOLITION / NEW
E-004	K.W. NEATBY BUILDING – EXISTING PARTIAL SINGLE LINE DIAGRAM
E-005	K.W. NEATBY BUILDING – NEW PARTIAL SINGLE LINE DIAGRAM
E-006	K.W. NEATBY BUILDING – EXISTING / NEW PANEL SCHEDULES

LISTE DES DESSINS

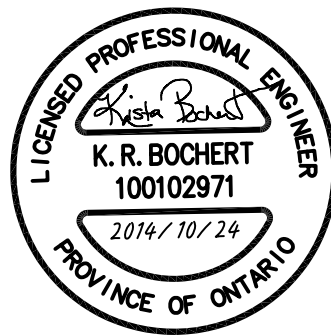
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E-003	ÉDIFICE K.W. NEATBY – PLAN PARTIEL DE L'APPENTIS DÉMOLITION /NOUVEAU
E-004	ÉDIFICE K.W. NEATBY – SCHÉMA PARTIEL À LIGNES UNIFILAIRES EXISTANT
E-005	ÉDIFICE K.W. NEATBY – NOUVEAU SCHÉMA PARTIEL À LIGNES UNIFILAIRES
E-006	ÉDIFICE K.W. NEATBY – CHARTES DE PANNEAUX EXISTANT & NOUVEAU

LEGEND

SYMBOL	DESCRIPTION
	RECESSED PANEL
	SURFACE PANEL
	DISCONNECT SWITCH
	MOTOR STARTER
A. EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO BE DEMOLISHED IS SHOWN IN THICK DASHED LINES.	
B. EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.	
C. EXCEPT AS NOTED OTHERWISE, ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.	

LÉGENDE

SYMBOLE	DESCRIPTION
	PANNEAU ENCASTRÉ
	PANNEAU EN SURFACE
	INTERRUPTEUR DE SÛRETÉ
	DÉMARREUR
A. TOUT L'ÉQUIPEMENT À DÉMOLIR EST INDiqué AVEC UN TRAIT ÉPAIS POINTILLÉ, SAUF INDICATION CONTRAIRE.	
B. TOUT L'ÉQUIPEMENT EXISTANT À CONSERVER EST INDiqué AVEC UN TRAIT FIN CONTINU, SAUF INDICATION CONTRAIRE.	
C. TOUT L'ÉQUIPEMENT PROJETÉ EST INDiqué AVEC UN TRAIT ÉPAIS CONTINU, SAUF INDICATION CONTRAIRE.	



Contractor to verify all dimensions
& conditions on site and immediately
notify the engineer of all discrepancies.

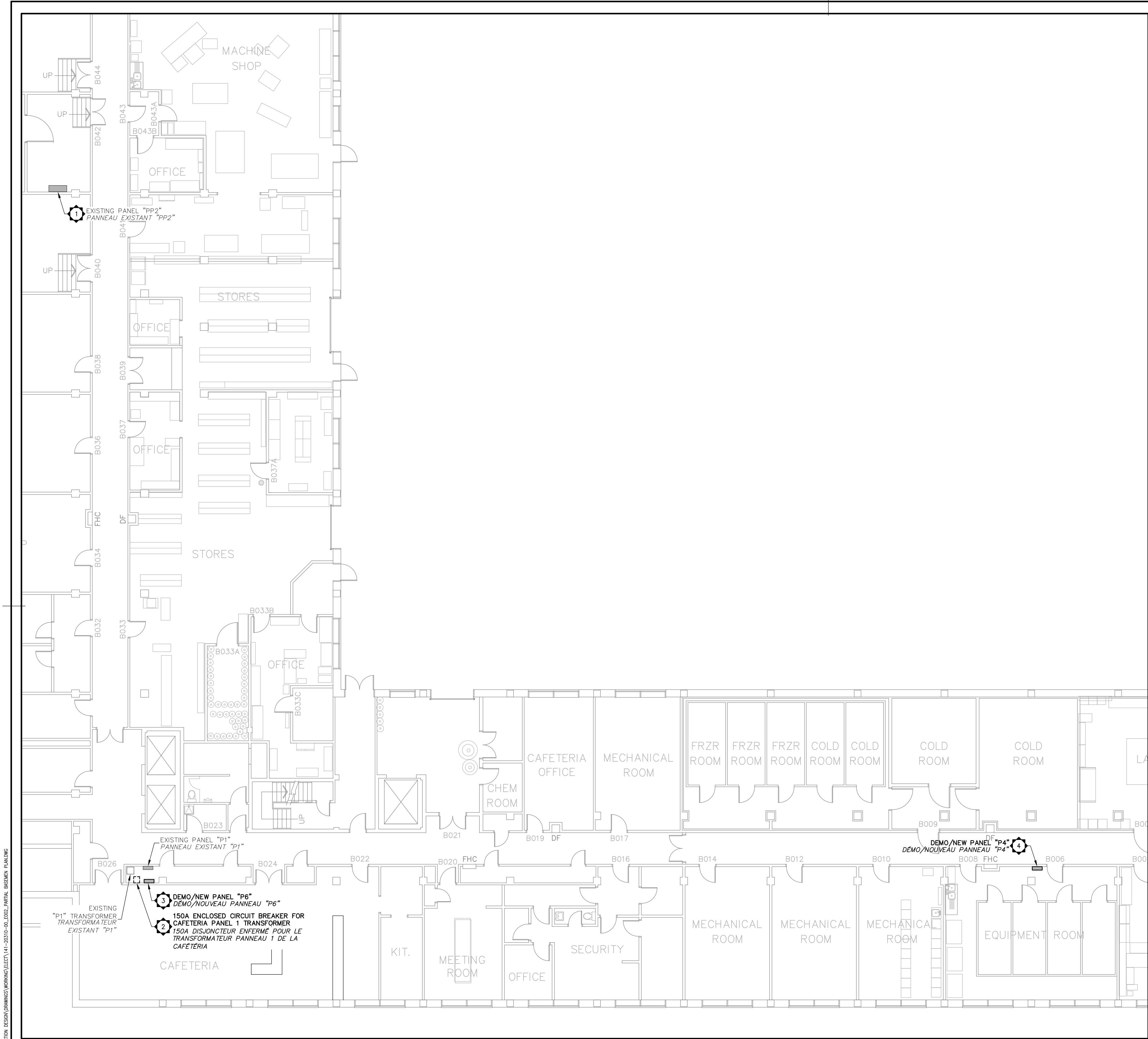
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2	TENDER – READY PRÊT – SOUMISSION	2014/10/16
1	ISSUED FOR 95% REVIEW EMIS POUR RÉVISION 95%	2014/09/19
revisions	description	date

A C	A detail no. no. du détail B location drawing no. sur dessin no. C drawing no. dessin no.	A B C
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project
**CENTRAL
EXPERIMENTAL FARM
SHORT CIRCUIT CORRECTION**
*FERME EXPÉRIMENTALE
CENTRALE - CORRECTION
DES COURTS-CIRCUITS*
OTTAWA, ONTARIO

drawing
**K.W. NEATBY BUILDING
KEY PLANS, GENERAL
NOTES & LEGEND**
*ÉDIFICE K.W. NEATBY
PLANS CLÉS,
NOTES GÉNÉRALES & LÉGENDE*

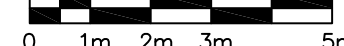
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Drawn By JEAN-PIERRE R. DUBÉ 2014/09/11	Dessiné par (yyyy/mm/dd)
Reviewed By KRISTA BOCHERT 2014/09/11	Examiné par (yyyy/mm/dd)
Approved By KRISTA BOCHERT 2014/09/11	Approuvé par (yyyy/mm/dd)
Tender -- ROBERT RANGER Project Manager	Soumission Administrateur de projets
Project no. CEF14-0025	No. du projet
Drawing no. E-001	No. du dessin



DRAWING LOCATION: P:\141-2000\141-2010-00-001-002-PARTIAL BASEMENT PLAN.DWG
PWGSC A1 (841x594)

1
E-002

PARTIAL BASEMENT PLAN
PLAN PARTIEL DU SOUS-SOL
1:125



GENERAL NOTES / NOTES GÉNÉRALES:

- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO BE REPLACED WITH NEW IS SHOWN IN THICK DASHED LINES.
- EXCEPT AS NOTED OTHERWISE ALL EXISTING EQUIPMENT TO BE RELOCATED IS SHOWN IN THICK DASHED LINES AND IS MARKED WITH THE LETTER 'R'.
- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
- CONTRACTOR SHALL REPLACE 3 DISTRIBUTION PANELS, AS INDICATED AND DETAILED IN PANEL SCHEDULES, DURING A SINGLE 12 HOUR SHUTDOWN TO BE SCHEDULED BETWEEN THE HOURS OF 6PM AND 6AM. SHUTDOWN TO BE ARRANGED WITH AGRICULTURE AND AGRI-FOOD CANADA, A MINIMUM OF 10 WORKING DAYS IN ADVANCE. CONTRACTOR TO PROVIDE SUFFICIENT PERSONNEL TO COMPLETE REPLACEMENT OF PANELS DURING A SINGLE SHUTDOWN. CONTRACTOR TO PROVIDE SEPARATE PRICE FOR THE REPLACEMENT OF A 4TH DISTRIBUTION PANEL "P4" DURING THE SAME SHUTDOWN. ASIDE FROM MEASUREMENTS, MINOR CLEAN UP AND NON-DISRUPTIVE PREPARATORY ACTIVITIES, ALL WORK MUST BE PERFORMED OUTSIDE OF REGULAR BUSINESS HOURS, DURING THE SHUTDOWN. DATA COLLECTION FOR POWER SYSTEMS STUDIES WILL ALSO BE PERMITTED WITHIN REGULAR BUSINESS HOURS.
- CONTRACTOR SHALL DISCONNECT EXISTING WIRING FROM PANELS TO BE REMOVED. ALL EXISTING AND NEW WIRING, INCLUDING BOTH SUPPLY AND FEEDER CONDUCTORS TO AND FROM EACH PANEL TO BE TESTED IN ACCORDANCE WITH SPECIFICATIONS, PRIOR TO ENERGIZING NEW PANEL. CONTRACTOR MUST RECORD TEST RESULTS AND SUBMIT FOR REVIEW.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING SITE CONDITIONS, INCLUDING DIMENSIONS OF EQUIPMENT, BUILDING ELEMENTS AND CIRCUIT BREAKER QUANTITIES AND RATINGS.
- CONTRACTOR SHALL MAINTAIN EXISTING PANELBOARD ENCLOSURE DIMENSIONS, MOUNTING LOCATION/HEIGHTS, AS WELL AS EXISTING CONFIGURATIONS OF CIRCUIT BREAKERS AND SPACES, IN ORDER TO PRESERVE EXISTING WIRING AND CONDUITS. IN CASES WHERE THIS IS NOT POSSIBLE, ANY WIRING THAT IS TOO SHORT TO REACH A NEW BREAKER OR NEUTRAL BAR AND IS WITHIN 4 METRES OF THE PANEL SHALL BE REPLACED. ANY OTHER CABLES OF INSUFFICIENT LENGTH CAN BE SPLICED USING COMPRESSION CRIMPS, PROVIDED NO OTHER OPTION EXISTS.
- ALL NEW PANELS MUST BE RATED SPRINKLER PROOF.
- CONTRACTOR TO PERFORM SHORT-CIRCUIT, DEVICE EVALUATION, COORDINATION AND ARC FLASH STUDIES FOR THE ENTIRE CENTRAL EXPERIMENTAL FARM CAMPUS. STUDIES TO BE PERFORMED OR REVIEWED AND SEALED BY AN ENGINEER LICENSED IN THE PROVINCE OF ONTARIO AND SUBMITTED IN CONJUNCTION WITH SHOP DRAWINGS, IN ACCORDANCE WITH SPECIFICATIONS.

- SAUF INDICATION CONTRAIRE, TOUS LES ÉQUIPEMENTS EXISTANTS QUI DOIVENT ÊTRE REMPLACÉS AVEC DES ÉQUIPEMENTS NEUFS SONT INDiquÉS AVEC UN TRAIT ÉPAIS POINTILLÉ.
- SAUF INDICATION CONTRAIRE, TOUS LES ÉQUIPEMENTS EXISTANTS À RELOCALISER SONT INDiquÉS AVEC UN TRAIT ÉPAIS POINTILLÉ ACCOMPAGNÉ DE LA LETTRE "R".
- SAUF INDICATION CONTRAIRE, TOUS LES ÉQUIPEMENTS EXISTANTS À CONSERVER SONT INDiquÉS AVEC UN TRAIT FIN CONTINU.
- L'ENTREPRENEUR DOIT REMPLACER 3 PANNEAUX DE DISTRIBUTION, TEL QU'INDIQUÉ ET DÉTAILLÉ DANS LES CHARTES DE PANNEAUX DURANT UNE SEULE COUPURE DE COURANT D'UNE DURÉE DE 12 HEURES ENTRE 6PM ET 6AM. LA COUPURE DE COURANT DOIT ÊTRE PLANIFIÉE AVEC AGRICULTURE ET AGROALIMENTAIRE CANADA, UN MINIMUM DE 10 JOURS OUVRABLES À L'AVANCE. L'ENTREPRENEUR DOIT FOURNIR LE PERSONNEL SUFFISANT POUR EFFECTUER LE REMPLACEMENT DES PANNEAUX DURANT UNE SEULE COUPURE DE COURANT. L'ENTREPRENEUR DOIT FOURNIR UN PRIX SÉPARÉ POUR LE REMPLACEMENT D'UN 4IÈME PANNEAU DE DISTRIBUTION DURANT LA MÊME COUPURE DE COURANT. À PART LES MESURES, LE NETTOYAGE MINORÉ ET LES ACTIVITÉS PRÉPARATOIRES NON-PERTURBATRICES, TOUS LES TRAVAUX DOIVENT ÊTRE COMPLÉTÉS EN DEHORS DES HEURES NORMALES DE BUREAU, PENDANT LA COUPURE DE COURANT. LE RECUEIL DES DONNÉES POUR LES ÉTUDES DE RÉSEAUX ÉLECTRIQUES SÉRA ÉGALEMENT PERMIS DURANT LES HEURES NORMALES DE BUREAU.
- L'ENTREPRENEUR DOIT DÉBRANCHER LE CÂBLAGE EXISTANT DES PANNEAUX QUI DOIVENT ÊTRE ENLEVÉS, TOUT LE CÂBLAGE EXISTANT ET NEUF, INCLUANT LES CONDUCTEURS D'ARTÈRES ET DE DISTRIBUTION MENANT À ET QUITTANT DE CHAQUE PANNEAU DOIT ÊTRE ÉPROUVÉ CONFORMÉMENT AUX SPÉCIFICATIONS, AVANT D'ALIMENTER LE NOUVEAU PANNEAU. L'ENTREPRENEUR DOIT ENREGISTRER LES RÉSULTATS DES ESSAIS ET DOIT LES SOUMETTRE POUR RÉVISION.
- L'ENTREPRENEUR EST RESPONSABLE DE VÉRIFIER LES CONDITIONS EXISTANTES DU SITE, INCLUANT LA DIMENSION DES ÉQUIPEMENTS, LES ÉLÉMENTS DU BÂTIMENT ET LA QUANTITÉ DE DISJONCTEUR ET LES CARACTÉRISTIQUES NOMINALES.
- L'ENTREPRENEUR DOIT RESPECTER LA DIMENSION DES COFFRETS DES PANNEAUX EXISTANTS, L'EMPLACEMENT ET LA HAUTEUR DE MONTAGE, AINSI QUE LA CONFIGURATION EXISTANTE DES DISJONCTEURS ET ESPACES, AFIN DE CONSERVER LE CÂBLAGE ET LES CONDUITS EXISTANTS. AU CAS OÙ CE N'EST PAS POSSIBLE, TOUT LE CÂBLAGE QUI EST TROP COURT POUR ATTEINDRE UN NOUVEAU DISJONCTEUR OU BARRE NEUTRE ET QUI SE RETROUVE DANS UN RAYON DE 4 MÈTRES DU PANNEAU DOIT ÊTRE REMPLACÉ. TOUS LES AUTRES CÂBLES DE LONGUEUR INSUFFISANTE PEUVENT ÊTRE PAR RACCORDEMENT SERTI, À CONDITION QU'AUCUNE AUTRE OPTION EXISTE.
- TOUS LES NOUVEAUX PANNEAUX DOIVENT ÊTRE ÉTANCHES AU GICLÉUR.
- L'ENTREPRENEUR DOIT EFFECTUER DES ÉTUDES DE COURT-CIRCUIT, D'ÉVALUATION DE DISPOSITIF, DE COORDINATION ET D'ARC ÉLECTRIQUE POUR TOUT LE CAMPUS DE LA FERME EXPÉRIMENTALE CENTRALE. LES ÉTUDES DOIVENT ÊTRE RÉALISÉES OU RÉVISÉES ET SCELLÉES PAR UN INGÉNIEUR COMPÉTENT RECONNU, HABILITÉ À EXERCER DANS LA PROVINCE DE L'ONTARIO ET SOUMIS EN CONJONCTION AVEC LES DESSINS D'ATELIER, CONFORMÉMENT AUX SPÉCIFICATIONS.

SPECIFIC NOTES / NOTES SPÉCIFIQUES:

- PANELS TO BE REPLACED IN BASEMENT TO BE ISOLATED DURING A SCHEDULED SHUTDOWN VIA CIRCUIT BREAKERS IN PANEL "PP2". REFER TO SINGLE-LINE DIAGRAM. SEPARATE PRICE TO BE PROVIDED FOR THE REPLACEMENT OF PANEL "P4".
 - ENCLOSED CIRCUIT BREAKER TO BE DISCONNECTED AND REMOVED. TRANSFORMER TO BE RE-SUPPLIED FROM 150A BREAKER IN NEW PANEL "P6".
 - DISCONNECT AND REMOVE PANEL "P6" AND REPLACE WITH NEW. REFER TO PANEL SCHEDULE.
 - DISCONNECT AND REMOVE PANEL "P4" AND REPLACE WITH NEW. REFER TO PANEL SCHEDULE.
- LES PANNEAUX QUI DOIVENT ÊTRE REMPLACÉS DANS LE SOUS-SOL DOIVENT ÊTRE ISOLÉS DURANT LA COUPURE DE COURANT PRÉVUE VIA LES DISJONCTEURS DANS LE PANNEAU "PP2". SE RÉFÉRER AU SCHEMA À LIGNES UNILINÉAIRES. UN PRIX SÉPARÉ DOIT ÊTRE FOURNI POUR LE REMPLACEMENT DU PANNEAU "P4".
 - LES DISJONCTEURS ENFERMÉS DOIVENT ÊTRE DÉBRANCHÉS ET ENLEVÉS. LE TRANSFORMATEUR DOIT ÊTRE RÉALIMENTÉ PAR UN DISJONCTEUR DE 150A DANS LE PANNEAU "P6".
 - DÉBRANCHER ET ENLEVER LE PANNEAU "P6" ET REMPLACER AVEC DU NOUVEAU. SE RÉFÉRER À LA CHARTE DE PANNEAU.
 - DÉBRANCHER ET ENLEVER LE PANNEAU "P4" ET REMPLACER AVEC DU NOUVEAU. SE RÉFÉRER À LA CHARTE DE PANNEAU.

Canada



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OTTAWA (ONTARIO) CANADA K2B 8K2
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Contractor to verify all dimensions & conditions on site and immediately notify the engineer of all discrepancies.

3	ISSUED FOR TENDER EMIS POUR SOUMISSION	2014/10/24
2	TENDER - READY PRET - SOUMISSION	2014/10/16
1	ISSUED FOR 95% REVIEW EMIS POUR RÉVISION 95%	2014/09/19
revisions	description	date

A C	A detail no. no. du détail B location drawing no. sur dessin no. C drawing no. dessin no.	A B C
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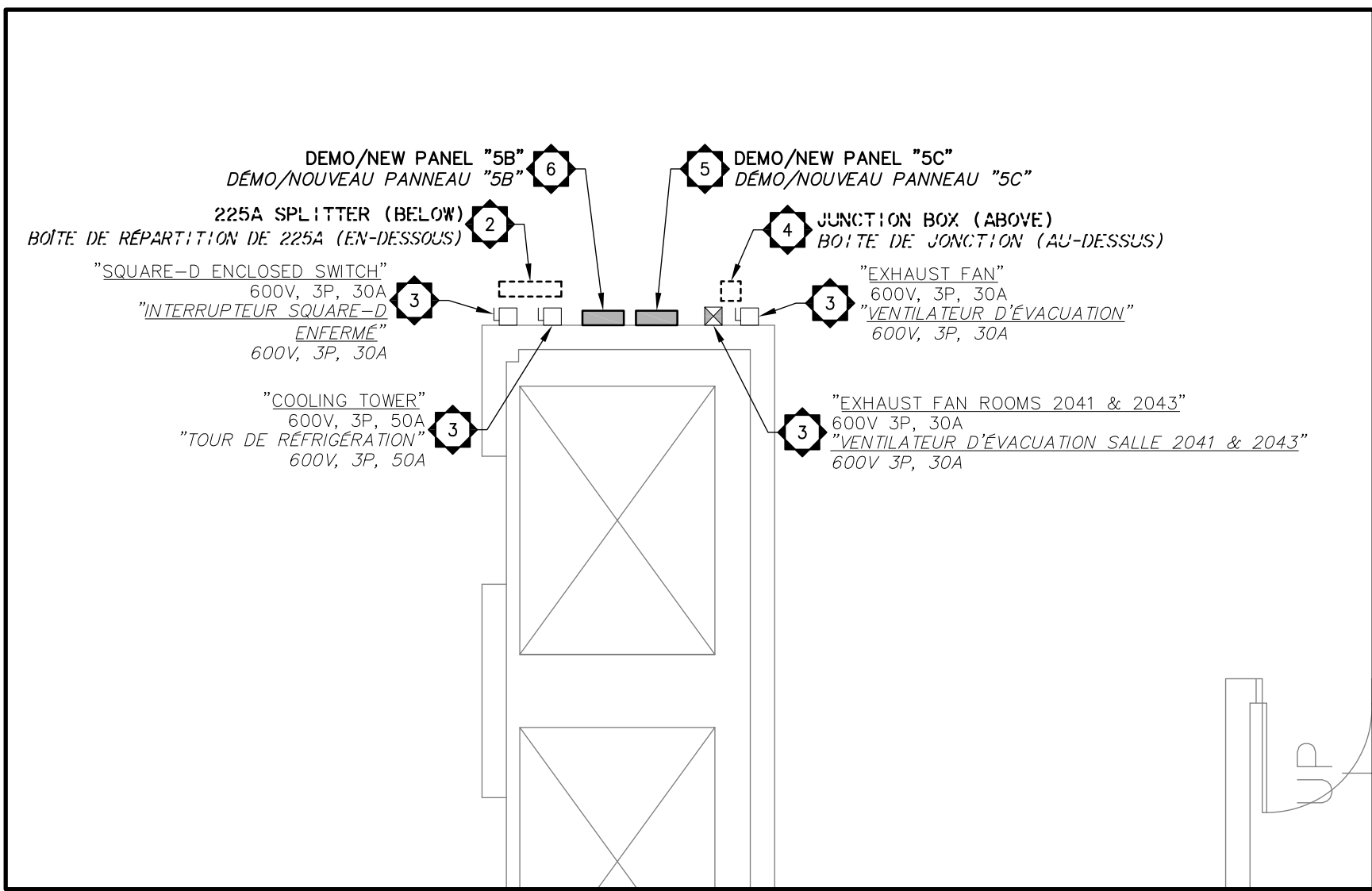
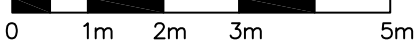
project CENTRAL
EXPERIMENTAL FARM
SHORT CIRCUIT CORRECTION
FERME EXPÉRIMENTALE
CENTRALE - CORRECTION
DES COURTS-CIRCUITS
OTTAWA, ONTARIO

drawing K.W. NEATBY BUILDING
PARTIAL BASEMENT PLAN
DEMOLITION / NEW
EDIFICE K.W. NEATBY
PLAN PARTIEL DU SOUS-SOL
DEMOLITION / NOUVEAU

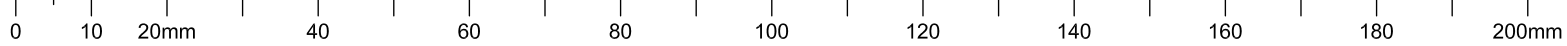
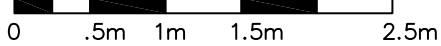
Designed By	KRISTA BOCHERT	Conçu par
Date	2014/09/11	(yyyy/mm/dd)
Drawn By	JEAN-PIERRE R. DUBÉ	Dessiné par
Date	2014/09/11	(yyyy/mm/dd)
Reviewed By	KRISTA BOCHERT	Examiné par
Date	2014/09/11	(yyyy/mm/dd)
Approved By	KRISTA BOCHERT	Approuvé par
Date	2014/09/11	(yyyy/mm/dd)
Tender	--	Soumission
Project Manager	ROBERT RANGER	Administrateur de projets
Project no.		No. du projet
	CEF14-0025	
Drawing no.		No. du dessin
	E-002	

DRAWING LOCATION: P:\141-2000\141-2010-00-001 SHORT CIRCUIT CORRECTION DESIGN\DRAWINGS\ELECTRICAL\2010-00-001-PARTIAL PENTHOUSE PLAN.DWG
PWGSC A1 (841x594)

1
E-003
PARTIAL PENTHOUSE PLAN
PLAN PARTIEL DE L'APPENTIS
1:100



2
E-003
PENTHOUSE ENLARGED PLAN
PLAN AGRANDIE DE L'APPENTIS
1:50



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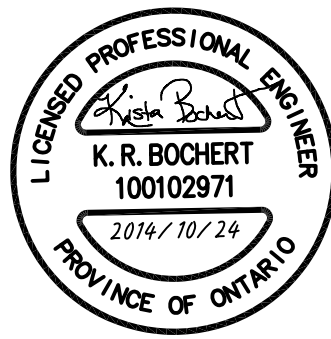
SPECIFIC NOTES / NOTES SPÉCIFIQUES:

- PANELS TO BE REPLACED IN PENTHOUSE TO BE ISOLATED DURING SCHEDULED SHUTDOWN VIA CIRCUIT BREAKERS IN PANEL "5A". REFER TO SINGLE LINE DIAGRAM.
 - 225A SPLITTER, CURRENTLY SUPPLIED FROM PANEL "5C" (TAPPED OFF MAINS), TO BE DISCONNECTED AND REMOVED. REPLACE WITH JUNCTION BOX. REMOVE WIRING FROM PANEL "5C AND TO DISCONNECT SWITCHES AND STARTER (NOTE 3).
 - PROVIDE NEW WIRING TO DISCONNECT SWITCHES AND STARTER FROM INDIVIDUAL CIRCUIT BREAKERS IN NEW PANEL "5C" THROUGH JUNCTION BOX (NOTE 2) AND EXISTING CONDUITS.
 - REMOVE JUNCTION BOX AND CONDUIT BACK TO 225A SPLITTER (NOTE 2).
 - DISCONNECT AND REMOVE PANEL "5C" AND REPLACE WITH NEW. REFER TO PANEL SCHEDULE.
 - DISCONNECT AND REMOVE PANEL "5B" AND REPLACE WITH NEW. REFER TO PANEL SCHEDULE.
- LES PANNEAUX QUI DOIVENT ÊTRE REMPLACÉS DANS L'APPENTIS DOIVENT ÊTRE ISOLÉS DURANT LA COUPURE DE COURANT PRÉVUE VIA LES DISJONCTEURS DANS LE PANNEAU "5A". SE RÉFÉRER AU SCHEMA À LIGNES UNIFILAIRES.
 - LA BOÎTE DE RÉPARTITION DE 225A, ACTUELLEMENT ALIMENTÉ PAR LE PANNEAU "5C" (BRANCHÉE AUX BARRES OMNIBUS), DOIT ÊTRE DÉBRANCHÉE ET ENLEVÉE. REMPLACER AVEC UNE BOÎTE DE JONCTION. ENLEVER LE CÂBLAGE DU PANNEAU "5C ET AUX SECTIONNEURS ET DÉMARREUR (NOTE 3).
 - FOURNIR DU NOUVEAU CÂBLAGE JUSQU'ÀUX SECTIONNEURS ET DÉMARREUR À PARTIR DU DISJONCTEUR INDIVIDUEL DANS LE PANNEAU "5C" PAR LA BOÎTE DE RÉPARTITION DE 225A (NOTE 2).
 - ENLEVER LA BOÎTE DE JONCTION ET LE CONDUIT JUSQU'À LA BOÎTE DE RÉPARTITION DE 225A (NOTE 2).
 - DÉBRANCHER ET ENLEVER LE PANNEAU "5C" ET REMPLACER AVEC DU NOUVEAU. SE RÉFÉRER À LA CHARTE DE PANNEAU.
 - DISCONNECT AND REMOVE PANEL "5B" AND REPLACE WITH NEW. REFER TO PANEL SCHEDULE.

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Contractor to verify all dimensions & conditions on site and immediately notify the engineer of all discrepancies.

3	ISSUED FOR TENDER EMIS POUR SOUMISSION	2014/10/24
2	TENDER - READY PRÊT - SOUMISSION	2014/10/16
1	ISSUED FOR 95% REVIEW EMIS POUR RÉVISION 95%	2014/09/19
revisions	description	date

<div>A detail no. no. du détail</div> <div>B location drawing no. sur dessin no.</div> <div>C drawing no. dessin no.</div>	<div>A detail no. no. du détail</div> <div>B location drawing no. sur dessin no.</div> <div>C drawing no. dessin no.</div>
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project CENTRAL
EXPERIMENTAL FARM
SHORT CIRCUIT CORRECTION
FERME EXPÉRIMENTALE
CENTRALE - CORRECTION
DES COURTS-CIRCUITS
OTTAWA, ONTARIO

drawing K.W. NEATBY BUILDING
dessin PARTIAL PENTHOUSE PLAN
DEMOLITION / NEW

ÉDIFICE K.W. NEATBY
PLAN PARTIEL DE L'APPENTIS
DEMOLITION / NOUVEAU

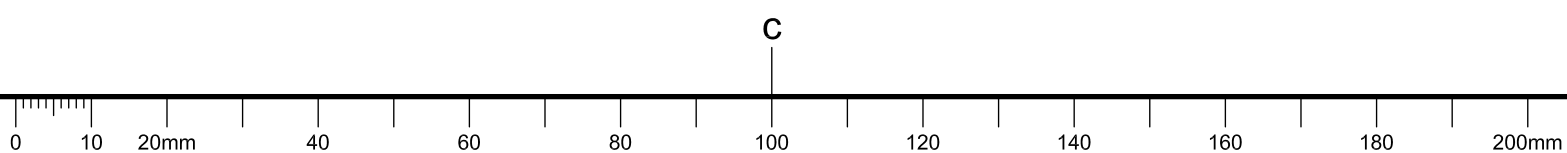
Designed By	KRISTA BOCHERT	Conçu par	
Date	2014/09/11	(yyyy/mm/dd)	
Drawn By	JEAN-PIERRE R. DUBÉ	Dessiné par	
Date	2014/09/11	(yyyy/mm/dd)	
Reviewed By	KRISTA BOCHERT	Examiné par	
Date	2014/09/11	(yyyy/mm/dd)	
Approved By	KRISTA BOCHERT	Approuvé par	
Date	2014/09/11	(yyyy/mm/dd)	
Tender	--	Soumission	
Project Manager	ROBERT RANGER	Administrateur de projets	
Project no.		No. du projet	

CEF14-0025

Drawing no. E-003
No. du dessin

E-003

PLOTTED ON: Friday, October 24, 2014 2:35:08 PM - BY: DUBE, JEAN PIERRE





Contractor to verify all dimensions
& conditions on site and immediately
notify the engineer of all discrepancies.

3	ISSUED FOR TENDER EMIS POUR SOUMISSION	2014/10/24
2	TENDER - READY PRET - SOUMISSION	2014/10/16
1	ISSUED FOR 95% REVIEW EMIS POUR REVISION 95%	2014/09/19

revisions	description	date
A	detail no. no. du detail	
B	location drawing no. sur dessin no.	
C	drawing no. dessin no.	

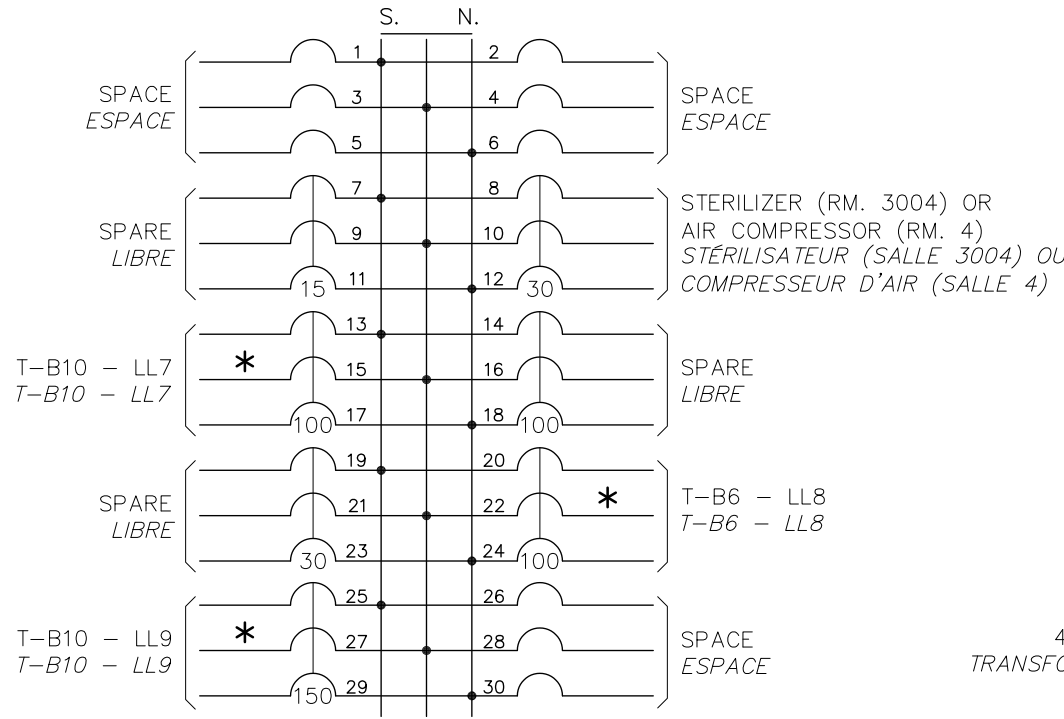
project
CENTRAL
EXPERIMENTAL FARM
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FERME EXPÉRIMENTALE
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OTTAWA, ONTARIO

drawing
K.W. NEATBY BUILDING
EXISTING & NEW
PANEL SCHEDULES
ÉDIFICE K.W. NEATBY
CHARTES DE PANNEAUX
EXISTANT & NOUVEAU

Designed By	KRISTA BOCHERT	Conçu par	
Date	2014/09/11	(yyyy/mm/dd)	
Drawn By	JEAN-PIERRE R. DUBÉ	Dessiné par	
Date	2014/09/11	(yyyy/mm/dd)	
Reviewed By	KRISTA BOCHERT	Examiné par	
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Tender	ROBERT RANGER	Soumission	
Project Manager	Administrateur de projets		
Project no.	No. du projet		
	CEF14-0025		
Drawing no.	No. du dessin		
	E-006		

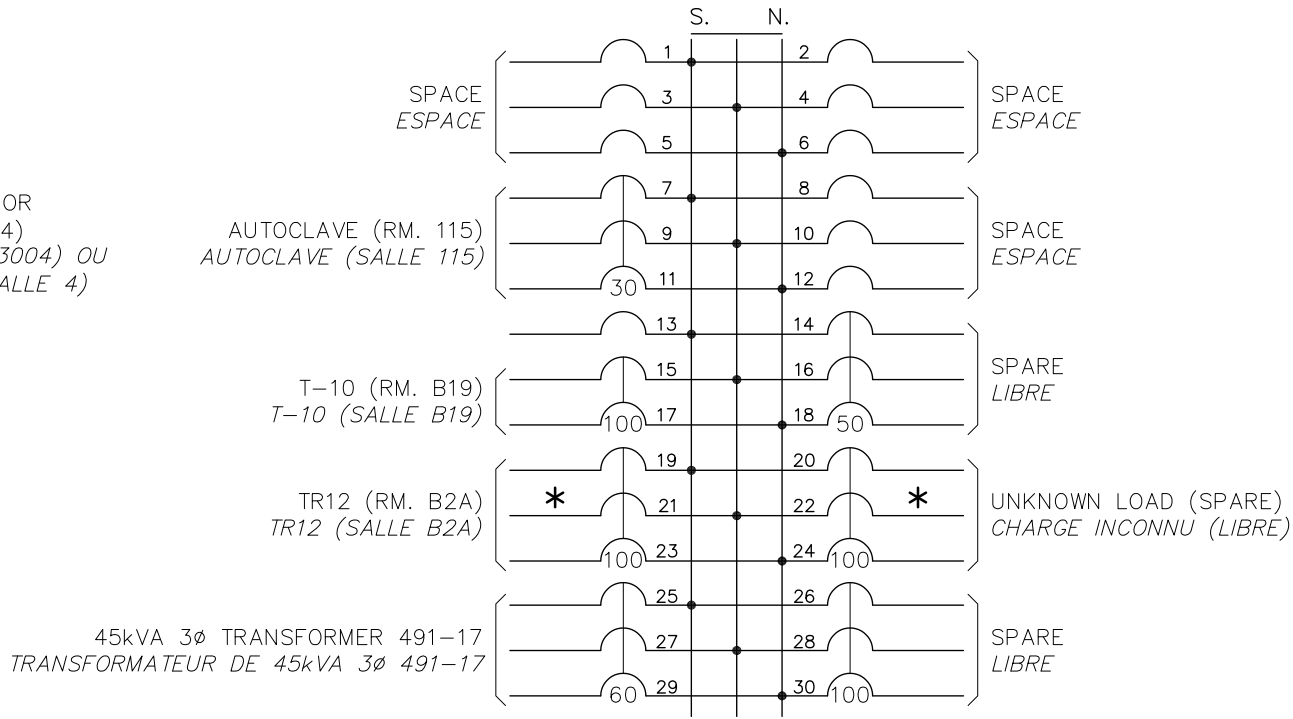
EXISTING PANEL "P4"
PANNEAU EXISTANT "P4"

600 VOLT, 3PH, 3W/3F
400A MAINS / BARRES 400A
SURFACE MOUNTED / MONTÉ EN SURFACE



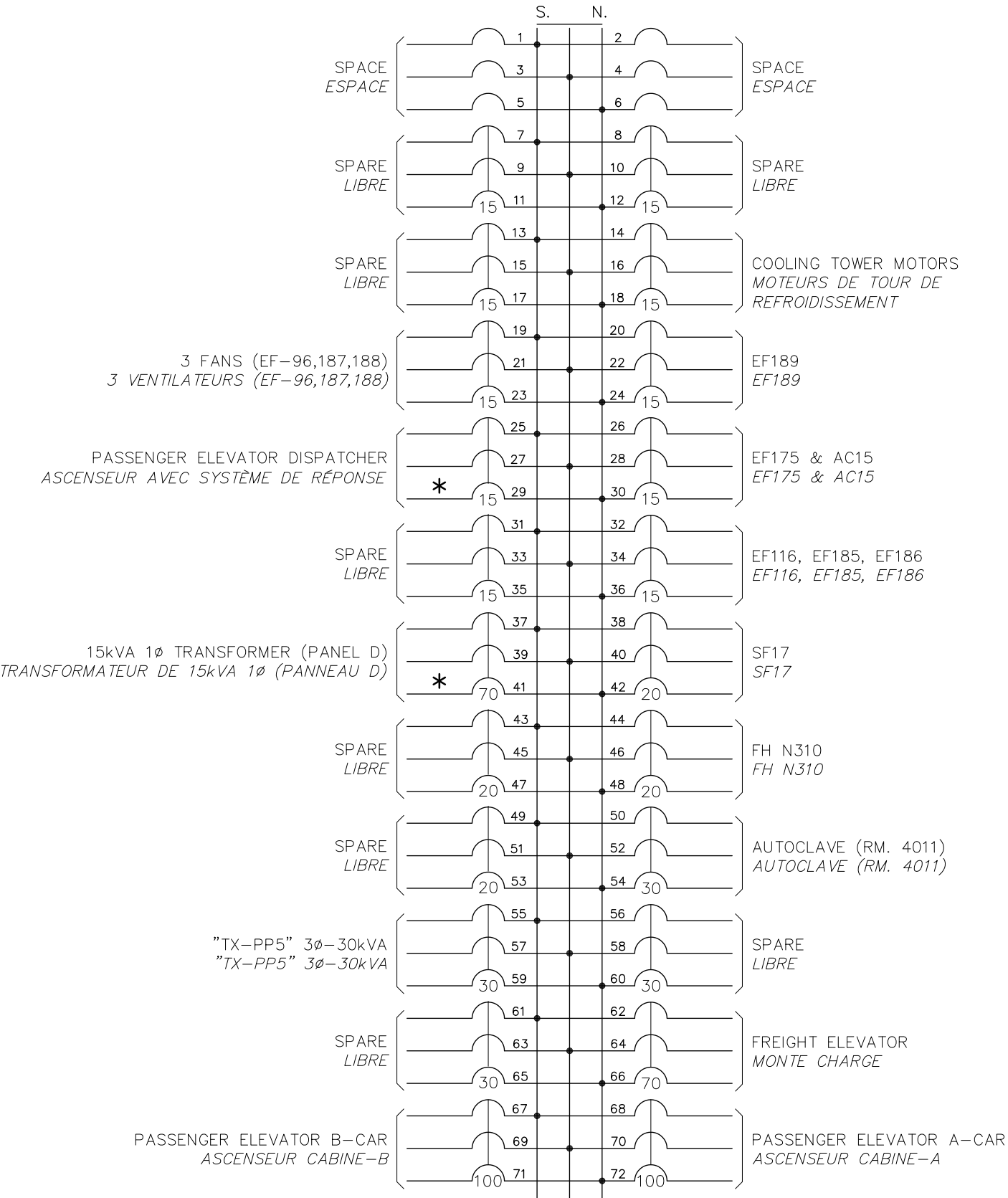
EXISTING PANEL "P6"
PANNEAU EXISTANT "P6"

600 VOLT, 3PH, 3W/3F
400A MAINS / BARRES 400A
SURFACE MOUNTED / MONTÉ EN SURFACE



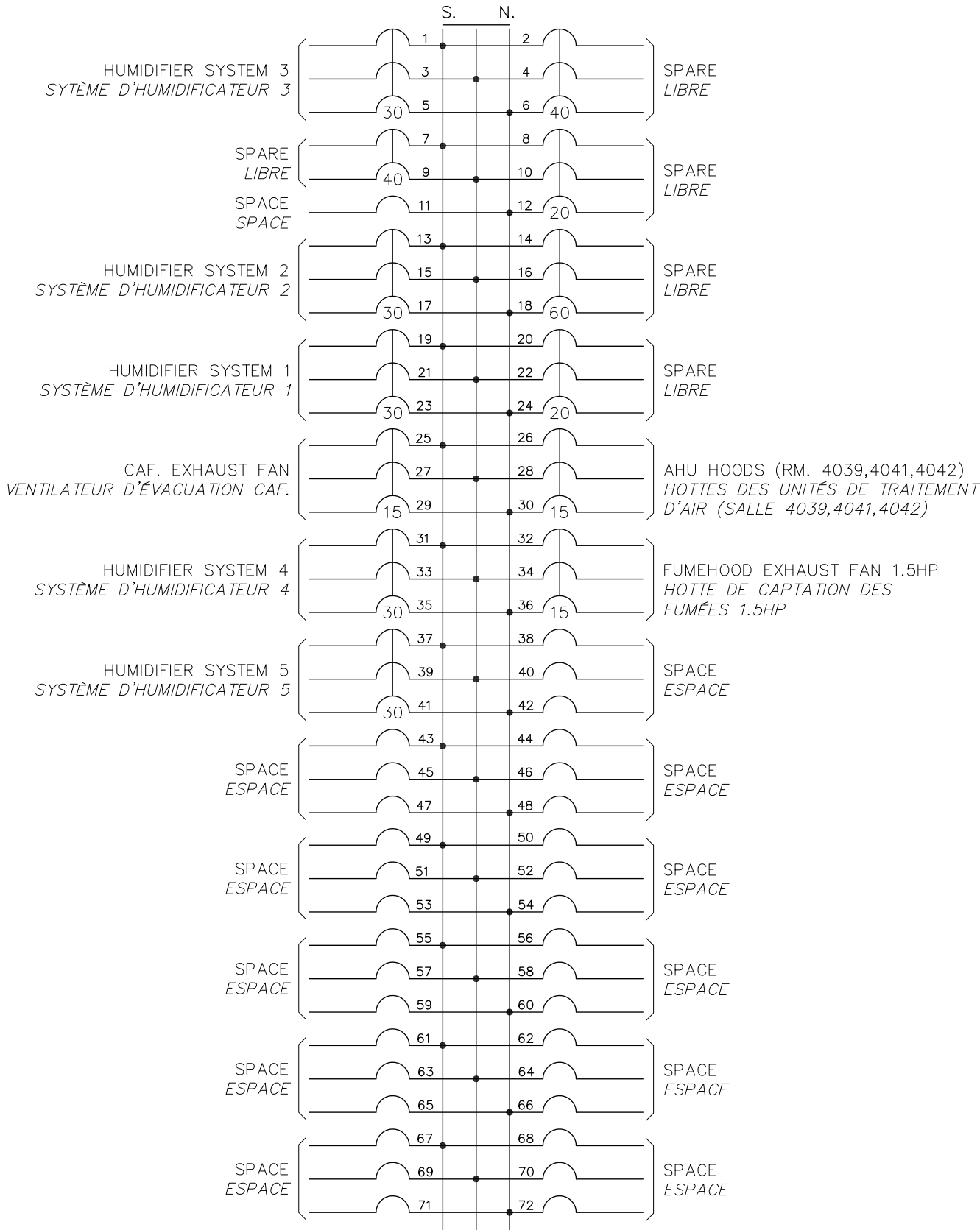
EXISTING PANEL "5B"
PANNEAU EXISTANT "5B"

600 VOLT, 3PH, 3W/3F
200A MAINS / BARRES 200A
SURFACE MOUNTED / MONTÉ EN SURFACE



EXISTING PANEL "5C"
PANNEAU EXISTANT "5C"

600 VOLT, 3PH, 3W/3F
225A MAINS / BARRES 225A
SURFACE MOUNTED / MONTÉ EN SURFACE

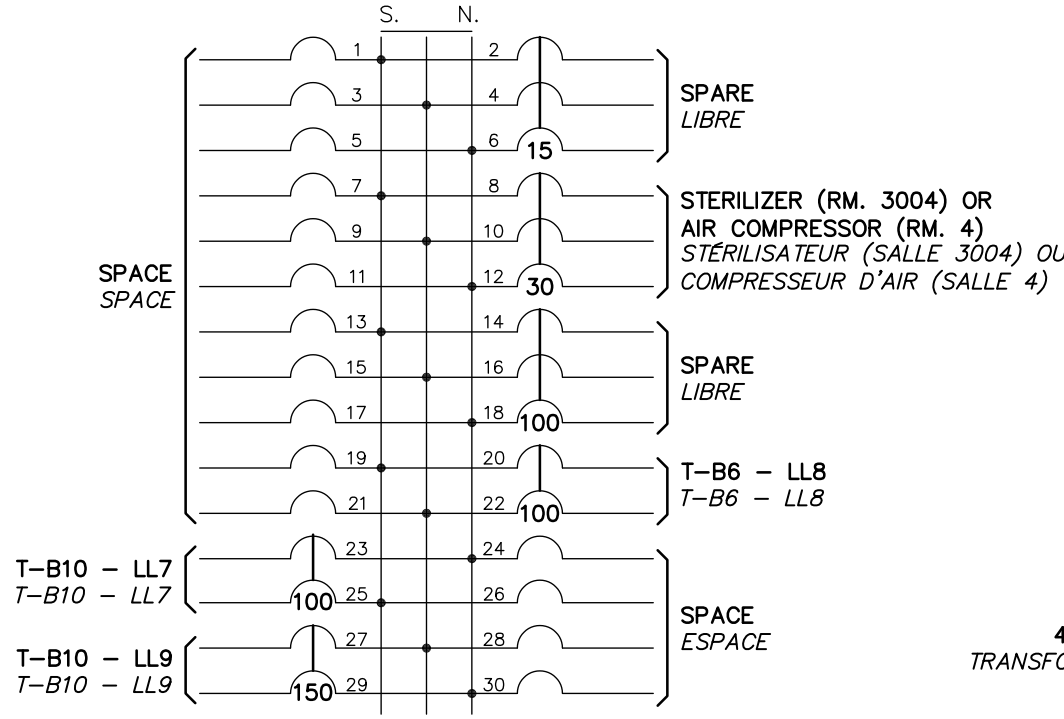


PANEL NOTE / NOTE DE PANNEAU:

- * = DENOTES UNUSED POLE / PHASE OF A 3P CIRCUIT BREAKER.
- * = INDIQUE UN POLE NON UTILISÉ / PHASE D'UN DISJONCTEUR À 3P.

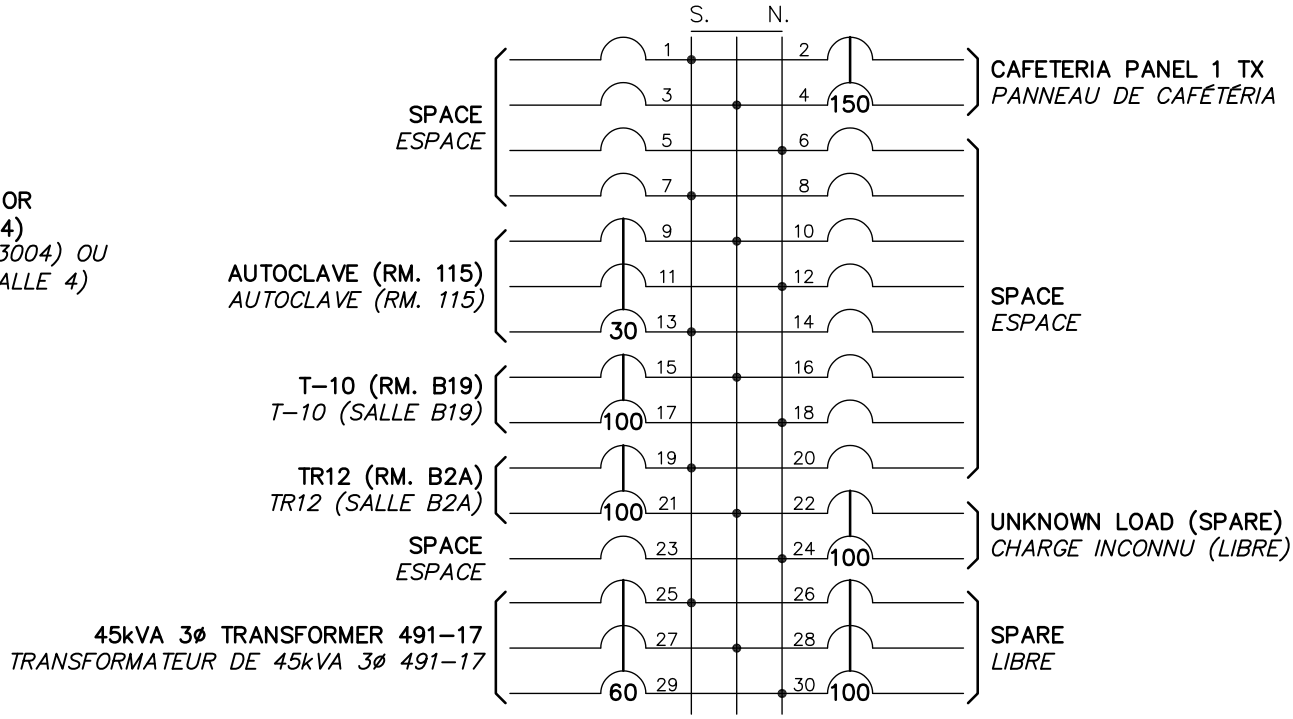
NEW PANEL "P4"
NOUVEAU PANNEAU "P4"

600 VOLT, 3PH, 3W/3F, 18KAIC
400A MAINS / BARRES 400A
SURFACE MOUNTED / MONTÉ EN SURFACE



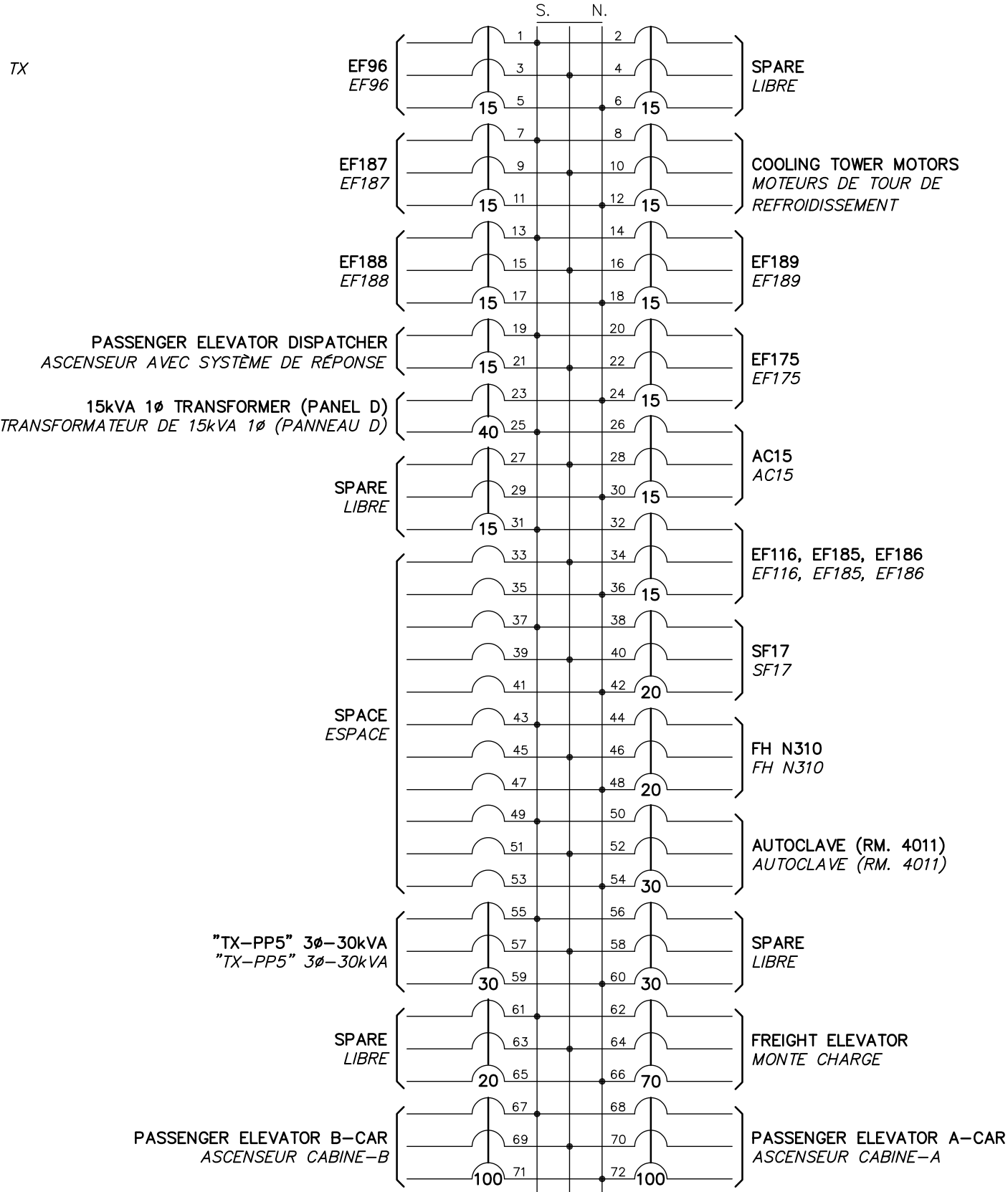
NEW PANEL "P6"
NOUVEAU PANNEAU "P6"

600 VOLT, 3PH, 3W/3F, 22KAIC
400A MAINS / BARRES 400A
SURFACE MOUNTED / MONTÉ EN SURFACE



NEW PANEL "5B"
NOUVEAU PANNEAU "5B"

600 VOLT, 3PH, 3W/3F, 22KAIC
225A MAINS / BARRES 200A
SURFACE MOUNTED / MONTÉ EN SURFACE



NEW PANEL "5C"
NOUVEAU PANNEAU "5C"

600 VOLT, 3PH, 3W/3F, 22KAIC
225A MAINS / BARRES 225A
SURFACE MOUNTED / MONTÉ EN SURFACE

