Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

INVITATION TO TENDER

RETURN BIDS TO:

Bid Receiving / Agriculture and Agri-Food Canada

Agriculture and Agri-Food Canada
Eastern Service Centre
Tender Receiving Unit
2001 Robert-Bourassa Blvd., Suite 671-TEN
Montréal, Quebec
H3A 3N2

TENDER TO:

Agriculture and Agri-Food Canada
We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the construction listed herein and on any attached sheets at the price(s) set out therefor.

Comments
This invitation to tender has a non mandatory site visit which will take place on : Wednesday September 18, 2019 at 10:30 AM (EDT).

The project must be deliverd on March 31st, 2020

ISSUING OFFICE

Agriculture and Agri-Food Canada
Eastern Service Centre
Tender Receiving Unit
2001 Robert-Bourassa Blvd., Suite 671-TEN
Montréal, Quebec
H3A 3N2

Title: CR-2 and CR-3 Cooling Tower Replacement	
Solicitation No.: 01B46-19-089	Date: 2019-09-11
Client Reference No.:	
File No.:	
Solicitation Closes: Friday, September 27, 2019, at 02:00 PM, EDT.	
F.O.B ◯ Plant ◉ Destination ◯ Other	
Address Enquiries to: Aline Mulinda	
Title: A/ Senior contract officer	
Email: aline.mulinda@canada.ca	
Telephone Number Ext.: 514 315-6140	Fax Number: 514 283-1918
Destination: Agriculture and Agri-Food Canada Saint-Jean-sur-Richelieu Research and Development Centre 430 Gouin Boulevard St-Jean-sur-Richelieu QC J3B 3E6	

Instructions: See Herein

Delivery Required: 2020-03-31	Delivery Offered:
Vendor / Firm Name and Address	
Telephone Number Ext.	Fax Number
Name and title of person authorized to sign on behalf of Vendor / Firm (type or print) Signature _____ Date _____	

Canada

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Appendix "A"

GENERAL INSTRUCTIONS TO BIDDERS

GENERAL INSTRUCTIONS TO BIDDERS

GI01 COMPLETION OF BID

1) The bid shall be:

   (a) submitted on the BID AND ACCEPTANCE FORM provided by AAFC with the bid package 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

      (i) bid security as specified in GI07; and
      (ii) 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 GI10, 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. 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.

GI02 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.

GI03 APPLICABLE TAXES

1) "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.

GI04 CAPITAL DEVELOPMENT AND REDEVELOPMENT CHARGES

1) For the purposes of GC1.8 LAWS, PERMITS AND TAXES 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.

GI05 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.

GI06 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 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 shall result in the disqualification of its bid.

GI07 BID SECURITY REQUIREMENTS

1) The Bidder shall submit bid security with the bid in the form of a bid bond or a security deposit in an amount that is equal to not less than 10 percent of the bid amount. Applicable Taxes shall not be included when calculating the amount of any bid security that may be required. The maximum amount of bid security required with any bid is $2,000,000.00.

2) A bid bond shall be in an approved form http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494&section=text#appS, properly completed, with original signature(s) and issued by an approved company whose bonds are acceptable to Canada either at the time of solicitation closing or as identified in Treasury Board Appendix L: Acceptable Bonding Companies.

3) A security deposit shall be an original, properly completed, signed where required and be either:

   (a) a bill of exchange, bank draft or money order made payable to the Receiver General for Canada and certified by an approved financial institution or drawn by an approved financial institution on itself; or

   (b) bonds of, or unconditionally guaranteed as to principal and interest by, the Government of Canada;

4) For the purposes of subparagraph 3) (a) of GI07

   (a) a bill of exchange is an unconditional order in writing signed by the Bidder and addressed to an approved financial institution, requiring the said institution to pay, on demand, at a fixed or determinable future time a sum certain of money to, or to the order of, the Receiver General for Canada;

   (b) if a bill of exchange, bank draft or money order is certified by or drawn on an institution or corporation other than a chartered bank, it must be accompanied by proof that the said institution or corporation meets at least one of the criteria described in subparagraph 4.c. of GI07, either by letter or by a stamped certification on the bill of exchange, bank draft or money; and

   (c) An approved financial institution is:
      (i) a corporation or institution that is a member of the Canadian Payments Association as defined in the Canadian Payments Act;
      (ii) a corporation that accepts deposits that are insured, to the maximum permitted by law, by the Canada Deposit Insurance Corporation or the "Autorité des marchés financiers";
      (iii) a corporation that accepts deposits from the public if repayment of the deposit is guaranteed by Her Majesty the Queen in right of a province;
      (iv) a corporation, association or federation incorporated or organized as a credit union or co-operative credit society that conforms to the requirements of a credit union which are more particularly described in paragraph 137(6) of the Income Tax Act; or
      (v) Canada Post Corporation.

5) Bonds referred to in subparagraph 3)(b) of GI07 shall be provided on the basis of their market value current at the date of solicitation closing, and shall be:

   (a) payable to bearer;

   (b) accompanied by a duly executed instrument of transfer of the bonds to the Receiver General for Canada in the form prescribed by the Domestic Bonds of Canada Regulations; or

   (c) registered as to principal or as to principal and interest in the name of the Receiver General for Canada pursuant to the Domestic Bonds of Canada Regulations.

6) As an alternative to a security deposit an irrevocable standby letter of credit is acceptable to Canada and the amount shall be determined in the same manner as a security deposit referred to above.

7) An irrevocable standby letter of credit referred to in paragraph 6) of GI07 shall

(a) be an arrangement, however named or described, whereby a financial institution (the "Issuer") acting at the request and on the instructions of a customer (the "Applicant) or on its own behalf,

(i) is to make a payment to, or to the order of, the Receiver General for Canada as the beneficiary;

(ii) is to accept and pay bills of exchange drawn by the Receiver General for Canada;

(iii) authorizes another financial institution to effect such payment or accept and pay such bills of exchange; or

(iv) authorizes another financial institution to negotiate against written demand(s) for payment provided that the terms and conditions of the letter of credit are complied with;

(b) state the face amount which may be drawn against it;

(c) state its expiry date;

(d) provide for sight payment to the Receiver General for Canada by way of the financial institution's draft against presentation of a written demand for payment signed by the Departmental Representative identified in the letter of credit by his/her office;

(e) provide that more than one written demand for payment may be presented subject to the sum of those demands not exceeding the face value of the letter of credit;

(f) provide that it is subject to the International Chamber of Commerce (ICC) Uniform Customs and Practice (UCP) for Documentary Credits, 2007 Revision, ICC Publication No. 600; pursuant to the ICC UCP; a credit is irrevocable even if there is no indication to that effect; and

(g) be issued or confirmed, in either official language, by a financial institution which is a member of the Canadian Payments Association and is on the letterhead of the Issuer or Confirmer. The format is left to the discretion of the Issuer or Confirmer.

8) Bid security shall lapse or be returned as soon as practical following:

(a) the solicitation closing date, for those Bidders submitting non-compliant bids; and

(b) the administrative bid review, for those Bidders submitting compliant bids ranked fourth to last on the schedule of bids; and

(c) the award of contract, for those Bidders submitting the second and third ranked bids; and

(d) the receipt of contract security, for the successful Bidder; or

(e) the cancellation of the solicitation, for all Bidders.

9) Notwithstanding the provisions of paragraph 8) of GI07 and provided more than three compliant bids have been received, if one or more of the bids ranked third to first is withdrawn or rejected

for whatever reason then Canada reserves the right to hold the security of the next highest ranked compliant bid in order to retain the bid security of at least three valid and compliant bids.

GI08 SUBMISSION OF BID

1) The Bid and Acceptance Form, duly completed, and the bid security shall be enclosed and sealed in an envelope provided by the Bidder, and shall be addressed and submitted to the office designated on the INVITATION TO TENDER 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 Number;

   (b) Name of Bidder;

   (c) Return address; and

   (d) Closing Date and Time.

4) Timely and correct delivery of bids is the sole responsibility of the Bidder.

GI09 REVISION OF BID

1) A bid submitted in accordance with these instructions may be revised by letter or facsimile 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 solicitation. The letter or facsimile shall be on the Bidder's letterhead or bear a signature that identifies the Bidder;

2) A revision to a bid that includes unit prices must clearly identify the changes(s) in the unit price(s) and the specific item(s) to which each change applies.

3) A letter or facsimile submitted to confirm an earlier revision shall be clearly identified as a confirmation.

4) 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).

GI10 REJECTION 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 GI10, 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 or 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) the Bidder is bankrupt, or where for whatever reason, its activities are rendered inoperable for an extended period;

(e) 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;

(f) evidence satisfactory to Canada that based on past conduct or behavior, the Bidder, a sub-contractor or a person who is to perform the Work is unsuitable or has conducted himself/herself improperly;

(g) with respect to current or prior transactions with Canada
  (i) 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
  (ii) 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)(g)(ii)of GI10, 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 GI10, 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) Where Canada intends to reject a bid pursuant to a provision of paragraphs 1), 2), 3) or 4) of GI10, other than subparagraph 2)(g)of IT10, the contracting authority will inform the Bidder and provide the Bidder ten (10) days within which to make representations, before 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.

GI11 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.

GI12 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 GI12, 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 GI12 shall result in disqualification of the bid.

GI13 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 solicitation 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 solicitation closing date.

GI14 CONFLICT OF INTEREST - UNFAIR ADVANTAGE

1) In order to protect the integrity of the procurement process, bidders are advised that Canada may reject a bid in the following circumstances:

(a) if the Bidder, any of its subcontractors, any of their respective employees or former employees was involved in any manner in the preparation of the bid solicitation or in any situation of conflict of interest or appearance of conflict of interest;

(b) if the Bidder, any of its subcontractors, any of their respective employees or former employees had access to information related to the bid solicitation that was not available to other bidders and that would, in Canada's opinion, give or appear to give the Bidder an unfair advantage.

2) The experience acquired by a bidder who is providing or has provided the goods and services described in the bid solicitation (or similar goods or services) will not, in itself, be considered by Canada as conferring an unfair advantage or creating a conflict of interest. This bidder remains however subject to the criteria established above.

3) Where Canada intends to reject a bid under this section, the Contracting Authority will inform the Bidder and provide the Bidder an opportunity to make representations before making a final decision. Bidders who are in doubt about a particular situation should contact the Contracting Authority before bid closing. By submitting a bid, the Bidder represents that it does not consider itself to be in conflict of interest nor to have an unfair advantage. The Bidder acknowledges that it is within Canada's sole discretion to determine whether a conflict of interest, unfair advantage or an appearance of conflict of interest or unfair advantage exists.

GI15 INTEGRITY PROVISIONS - BID

1) Ineligibility and Suspension Policy (the “Policy”), and all related Directives, are incorporated by reference into, and form a binding part of the procurement process. The Supplier must comply with the Policy and Directives, which can be found at *Ineligibility and Suspension Policy*.

2) Under the Policy, charges and convictions of certain offences against a Supplier, its affiliates or first tier subcontractors, and other circumstances, will or may result in a determination by Public Works and Government Services Canada (PWGSC) that the Supplier is ineligible to enter, or is suspended from entering into a contract with Canada. The list of ineligible and suspended Suppliers is contained in PWGSC’s Integrity Database. The Policy describes how enquiries can be made regarding the ineligibility or suspension of Suppliers.

3) In addition to all other information required in the procurement process, the Supplier must provide the following:

a. by the time stated in the Policy, all information required by the Policy described under the heading “Information to be Provided when Bidding, Contracting or Entering into a Real Property Agreement”; and

b. with its bid / quote / proposal, a complete list of all foreign criminal charges and convictions pertaining to itself, its affiliates and its proposed first tier subcontractors that, to the best of its knowledge and belief, may be similar to one of the listed offences in the Policy. The list of foreign criminal charges and convictions must be submitted using an Integrity Declaration Form, which can be found at Declaration form for procurement.

4) Subject to subsection 5, by submitting a bid / quote / proposal in response a request by AAFC, the Supplier certifies that:

a. it has read and understands the *Ineligibility and Suspension Policy*;

b. it understands that certain domestic and foreign criminal charges and convictions, and other circumstances, as described in the Policy, will or may result in a determination of ineligibility or suspension under the Policy;

c. it is aware that Canada may request additional information, certifications, and validations from the Supplier or a third party for purposes of making a determination of ineligibility or suspension;

d. it has provided with its bid / quote / proposal a complete list of all foreign criminal charges and convictions pertaining to itself, its affiliates and its proposed first tier subcontractors that, to the best of its knowledge and belief, may be similar to one of the listed offences in the Policy;

e. none of the domestic criminal offences, and other circumstances, described in the Policy that will or may result in a determination of ineligibility or suspension, apply to it, its affiliates and its proposed first tier subcontractors; and

f. it is not aware of a determination of ineligibility or suspension issued by PWGSC that applies to it.

5) Where a Supplier is unable to provide any of the certifications required by subsection 4, it must submit with its bid/ quote / proposal a completed Integrity Declaration Form, which can be found at Declaration form for procurement.

6) Canada will declare non-responsive any bid / quote / proposal in respect of which the information requested is incomplete or inaccurate, or in respect of which the information contained in a certification or declaration is found by Canada to be false or misleading in any respect. If Canada establishes after award of the Contract that the Supplier provided a false or misleading certification or declaration, Canada may terminate the Contract for default. Pursuant to the Policy, Canada may also determine the Supplier to be ineligible for award of a contract for providing a false or misleading certification or declaration.

Ineligibility and Suspension Policy - http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html

Declaration form for procurement - http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html

GI16 CODE OF CONDUCT FOR PROCUREMENT - BID

1) The Code of Conduct for Procurement provides that Bidders must respond to bid solicitations in an honest, fair and comprehensive manner, accurately reflect their capacity to satisfy the requirements set out in the bid solicitation and resulting contract, submit bids and enter into contracts only if they will fulfill all obligations of the Contract. By submitting a bid, the Bidder is certifying that it is complying with the Code of Conduct for Procurement. Failure to comply with the Code of Conduct for Procurement may render the bid non-responsive.

Appendix "B"

SPECIAL INSTRUCTIONS TO BIDDERS

SPECIAL INSTRUCTIONS TO BIDDERS (SI)

SI01 BID DOCUMENTS

1) The following are the bid documents:

   (a) INVITATION TO TENDER - Page 1 form AAFC / AAC5323-E;
   (b) SPECIAL INSTRUCTIONS TO BIDDERS form AAFC / AAC5301-E;
   (c) GENERAL INSTRUCTIONS TO BIDDERS form AAFC / AAC5313-E;
   (d) Clauses and Conditions identified in “CONTRACT DOCUMENTS”;
   (e) Drawings and Specifications;
   (f) BID AND ACCEPTANCE form AAFC / AAC5320-E and any Appendices attached thereto; and,
   (g) Any amendment issued prior to solicitation closing.

   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 named on the INVITATION TO TENDER - Page 1 as early as possible within the solicitation period. Except for the approval of alternative materials as described in GI13 of the GENERAL 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.

2) 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.

3) All enquiries and other communications related to this bid sent throughout the solicitation period are to be directed ONLY to the Contracting Officer named on the INVITATION TO TENDER - Page 1. Non-compliance with this requirement during the solicitation period can, for that reason alone, result in disqualification of a bid.

SI03 NON-MANDATORY SITE VISIT

1) There will be a site visit on Wednesday, September, 18 , 2019 at 10:30 ◉ AM ○ PM EDT.

Interested bidders are to meet at:

Saint-Jean-sur-Richelieu Research and Development Centre
430 Gouin Boulevard
St-Jean-sur-Richelieu QC J3B 3E6

SI04 REVISION OF BID

1) A bid may be revised by letter or facsimile in accordance with GI09 of the GENERAL INSTRUCTIONS TO BIDDERS. The facsimile number for receipt of revisions is 514 283-1918 .

SI05 BID RESULTS

1) Following bid closing, bid results may be obtained from the bid receiving office by email at aline.mulinda@canada.ca .

SI06 INSUFFICIENT FUNDING

1) In the event that the lowest compliant bid exceeds the amount of funding allocated for the Work, Canada in its sole discretion may:
   (a) cancel the solicitation; or
   (b) obtain additional funding and award the Contract to the Bidder submitting the lowest compliant bid; and/or
   (c) negotiate a reduction in the bid price and/or scope of work of not more than 15% with the Bidder submitting the lowest compliant bid. Should an agreement satisfactory to Canada not be reached, Canada shall exercise option (a) or (b).

SI07 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.

2) If the extension referred to in paragraph 1) of SI07 is accepted, in writing, by all those who submitted bids, then Canada shall continue immediately with the evaluation of the bids and its approvals processes.

3) If the extension referred to in paragraph 1) of SI07 is not accepted in writing by all those who submitted bids then Canada shall, at its sole discretion, either:
   (a) continue to evaluate the bids of those who have accepted the proposed extension and seek the necessary approvals; or
   (b) cancel the invitation to bid.

4) The provisions expressed herein do not in any manner limit Canada's rights in law or under GI10 of the GENERAL INSTRUCTIONS TO BIDDERS.

SI08 CONSTRUCTION DOCUMENTS

1) The successful contractor will be provided with one paper copy of the sealed and signed plans, the specifications and the amendments upon acceptance of the offer. Additional copies, up to a maximum of zero (0), will be provided free of charge upon request by the Contractor. Obtaining more copies shall be the responsibility of the Contractor including costs.

SI09 WEB SITES

The connection to some of the Web sites in the solicitation documents is established by the use of hyperlinks. The following is a list of the addresses of the Web sites:

Treasury Board Appendix L, Acceptable Bonding Companies
http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494&section=text#appL

Canadian economic sanctions
http://www.international.gc.ca/sanctions/index.aspx?lang=eng

SI10 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:

- 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.

Appendix "C"

BID AND ACCEPTANCE FORM

BID AND ACCEPTANCE FORM

CONSTRUCTION CONTRACT - MAJOR WORKS

BA01 IDENTIFICATION

Description of the Work

The works involve in general, but not limited to, the replacement of two cooling towers and associated equipment at the St-Jean-sur-Richelieu DRC Main Building. Dismantling works, building mechanical systems, electrical and control works, etc. are included in the project. A detailed works description is specified in the plans and specifications of the project.

Solicitation Number	File / Project Number
01B46-19-089	

BA02 BUSINESS NAME AND ADDRESS OF BIDDER

Name					
Address					
Unit/Suite/Apt.	Street number	Number suffix	Street name	Street type	Street direction
PO Box or Route Number			Municipality (City, Town, etc.)	Province	Postal code
Phone number			Fax number	Email address	

BA03 THE OFFER

1) The Bidder offers to Canada as represented by the Minister of Agriculture and Agri-food 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 (GST/HST/QST).

(to be expressed in numbers only)

BA04 BID VALIDITY PERIOD

1) The bid shall not be withdrawn for a period of 60 days following the date of solicitation closing.

BA05 APPENDICES

1) The following appendices are included in this Bid and Acceptance Form:

☒ Appendix 2

BA06 ACCEPTANCE AND CONTRACT

1) Upon acceptance of the Bidder's offer by Canada, a binding Contract shall be formed between Canada and the resulting Contractor. The documents forming the Contract shall be the contract documents referred to in SC01 CONTRACT DOCUMENTS.

BA07 CONSTRUCTION TIME

1) The Contractor shall perform and complete the Work on or before 2020-03-31

BA08 BID SECURITY

1) The Bidder shall enclose bid security with its bid in accordance with GI07 BID SECURITY REQUIREMENTS.

2) If a security deposit is furnished as bid security, it shall be forfeited in the event that the bid is accepted by Canada and the Contractor fails to provide Contract Security in accordance with GC9 CONTRACT SECURITY, provided that Canada may, if it is in the public interest, waive the right of Canada to forfeiture any or all of the security deposit.

BA09 SIGNATURE	
Name and title of person authorized to sign on behalf of Bidder (type or print)	Name
	Title
	Signature / Date
	Name
	Title
	Signature / Date

BA10 INTEGRITY PROVISIONS - LIST OF NAMES

If the required list of names has not been received by the time the evaluation of bids is completed, Canada will inform the Bidder of a time frame within which to provide the information. Failure to provide the names within the time frame specified will render the bid non-responsive. Providing the required names is a mandatory requirement for contract award.

Bidders who are incorporated, including those bidding as a joint venture, must provide a complete list of names of all individuals who are currently directors of the Bidder.

Bidders bidding as sole proprietorship, as well as those bidding as a joint venture, must provide the name of the owner(s).

Bidders bidding as societies, firms or partnerships do not need to provide lists of names.

BID AND ACCEPTANCE FORM

CONSTRUCTION CONTRACT - MAJOR WORKS

APPENDIX 2

LIST OF SUBCONTRACTORS

The Bidder will subcontract the parts of the work listed below to the subcontractor named for each part. The Bidder agrees not to make changes in the list of subcontractors without the written consent of the Departmental Representative. The Bidder understands that for each part of the work, if more than one subcontractor is named, or no subcontractor is named, or, the Bidder fails to state that the work will be done by its own forces where applicable, the bid will be subject to disqualification.

LIST OF EQUIPMENT

LIST OF MATERIALS

Appendix "D"

MAJOR WORKS - GENERAL CONDITIONS

MAJOR WORKS GENERAL CONDITIONS FORM AAFC 5321:

GC1 GENERAL PROVISIONS

GC1.1 (2016-05-01) INTERPRETATION

GC1.1.1 Headings and References

1) The headings in the contract documents, other than those in the drawings and specifications, form no part of the Contract but are inserted for convenience of reference only.

2) A reference made to a part of the Contract by means of numbers preceded by letters is a reference to the particular part of the Contract that is identified by that combination of letters and numbers and to any other part of the Contract referred to therein.

3) A reference to a paragraph or subparagraph followed by an identifying number, letter or combination thereof is, unless specifically stated otherwise, a reference to the paragraph or subparagraph that forms part of the clause within which the reference is made.

GC1.1.2 Terminology

In the Contract, unless the context otherwise requires:

"Administrative Agreement"

is a negotiated agreement with the Minister of AAFC as provided for in the Ineligibility and Suspension Policy.

“Affiliate”
is a person, including, but not limited to, organizations, bodies corporate, societies, companies, firms, partnerships, associations of persons, parent companies or subsidiaries, whether partly or wholly-owned, as well as individuals, directors, officers and key employees if:

(i) one controls or has the power to control the other, or
(ii) a third party has the power to control both.

"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", "Crown", "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;

"Contract Amount"
means the amount set out in the Contract to be payable to the Contractor for the Work, subject to the terms and conditions of the Contract, exclusive of Applicable Taxes;

"Contract Security"
means any security given by the Contractor to Canada in accordance with the Contract;

"Contractor"
means the person contracting with Canada to provide or furnish all labour, Material and Plant for the execution of the Work under the Contract, and includes the Contractor's superintendent as designated in writing to Canada.

"Certificate of Completion"
means a certificate issued by Canada when the Work reaches Completion;
"Certificate of Measurement"
means a certificate issued by Canada certifying the correctness of the final quantities, prices per unit and values of labour, Plant and Material performed, used and supplied by the Contractor for the construction of the part of the Work to which a Unit Price Arrangement applies;

"Certificate of Substantial Performance"
means a certificate issued by Canada when the Work reaches Substantial Performance;

“Control”
means:

a) direct control, such as where:
    (i) a person controls a body corporate if securities of the body corporate to which are attached more than 50 percent of the votes that may be cast to elect directors of the body corporate are beneficially owned by the person and the votes attached to those securities are sufficient, if exercised, to elect a majority of the directors of the body corporate;

(ii) a person controls a corporation that is organized on a cooperative basis if the person and all of the entities controlled by the person have the right to exercise more than 50 percent of the votes that may be cast at an annual meeting or to elect the majority of the directors of the corporation;

(iii) a person controls an unincorporated entity, other than a limited partnership, if more than 50 percent of the ownership interests, however designated, into which the entity is divided are beneficially owned by that person and the person is able to direct the business and affairs of the entity;

(iv) the general partner of a limited partnership controls the limited partnership; and

(v) a person controls an entity if the person has any direct or indirect influence that, if exercised, would result in control in fact of the entity.

b) deemed control, such as where:
a person who controls an entity is deemed to control any entity that is controlled, or deemed to be controlled, by the entity

c) indirect control, such as where:
a person is deemed to control, within the meaning of paragraph (a) or (b), an entity where the aggregate of:
(i) any securities of the entity that are beneficially owned by that person, and

(ii) any securities of the entity that are beneficially owned by any entity controlled by that person

is such that, if that person and all of the entities referred to in paragraph (c)(ii) that beneficially own securities of the entity were one person, that person would control the entity.

"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;

"herein", "hereby", "hereof", "hereunder"
and similar expressions refer to the Contract as a whole and not to any particular section or part thereof;

“Ineligibility”
means a person not eligible to contract with Canada;
"Lump Sum Arrangement"
means that part of the Contract that prescribes a lump sum as payment for performance of the Work to which it relates;

"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"

also 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 tradesperson in practicing a trade;

"Subcontractor"
means a person having a direct contract with the Contractor, subject to GC3.6

"Subcontracting", to perform a part or parts of the Work, or to supply Material customized for the Work;

"Superintendent"
means the employee or representative of the Contractor designated by the Contractor to act pursuant to GC2.6, "Superintendent";

"Supplementary Conditions"
means the part of the Contract that amends or supplements the General Conditions;

"Supplier"
means a person having a direct contract with the Contractor to supply Plant or Material not customized for the Work;

“Suspension”
means a determination of temporary ineligibility by the Minister of AAFC;

“Total Estimated Cost”, “Revised Estimated Cost”, “Increase (Decrease)”
on Page 1 of the Contract or Contract Amendment means an amount used for internal administrative purposes only that comprises the Contract Amount, or the revised Contract Amount, or the amount that would increase or decrease the Contract Amount and the Applicable Taxes as evaluated by the Contracting Authority, and does not constitute tax advice on the part of Canada;

"Unit Price Arrangement"
means that part of the Contract that prescribes the product of a price per unit of measurement multiplied by a number of units of measurement for performance of the Work to which it relates;

"Unit Price Table"
means the table of prices per unit set out in the Contract;

"Work"
means, subject only to any express stipulation in the Contract to the contrary, everything that is necessary to be done, furnished or delivered by the Contractor to perform the Contract in accordance with the contract documents; and

"Working Day"
means a day other than a Saturday, Sunday, or a statutory holiday that is observed by the construction industry in the area of the place of the Work.

GC1.1.3 Application of Certain Provisions

1) Any provisions of the Contract that are expressly stipulated to be applicable only to a Unit Price Arrangement are not applicable to any part of the Work to which a Lump Sum Arrangement applies.

2) Any provisions of the Contract that are expressly stipulated to be applicable only to a Lump Sum Arrangement are not applicable to any part of the Work to which a Unit Price Arrangement applies.

GC1.1.4 Substantial Performance

1) The Work shall be considered to have reached Substantial Performance when
   a) the Work or a substantial part thereof has passed inspection and testing and is, in the opinion of Canada, ready for use by Canada or is being used for the intended purposes; and

   b) the Work is, in the opinion of Canada, capable of completion or correction at a cost of not more than

      (i) 3 percent of the first $500,000;
      (ii) 2 percent of the next $500,000; and
      (iii) 1 percent of the balance

      of the Contract Amount at the time this cost is calculated.

2) Where the Work or a substantial part thereof is ready for use or is being used for the purposes intended and
   a. the remainder of the Work or a part thereof cannot be completed by the time specified in the Contract, or as amended in accordance with GC6.5, "Delays and Extension of Time", for reasons beyond the control of the Contractor; or

   b. Canada and the Contractor agree not to complete a part of the Work within the specified time;

the cost of that part of the Work that was either beyond the control of the Contractor to complete or Canada and the Contractor have agreed not to complete by the time specified, shall be deducted from the value of the Contract referred to in subparagraph 1)(b) of GC1.1.4 and the said cost shall not form part of the cost of the Work remaining to be done in determining Substantial Performance.

GC1.1.5 Completion

The Work shall be deemed to have reached Completion when all labour, Plant and Material required have been performed, used or supplied, and the Contractor has complied with the Contract and all orders and directions made pursuant thereto, all to the satisfaction of Canada.

GC1.2 (2016-05-01) CONTRACT DOCUMENTS

The following discusses contract documents

GC1.2.1 General

1) The contract documents are complementary, and what is required by any one shall be as binding as if required by all.

2) References in the contract documents to the singular shall be considered to include the plural as the context requires.

3) Nothing contained in the contract documents shall create a contractual relationship between Canada and any Subcontractor or Supplier, their subcontractors or suppliers, or their agents or employees.

GC1.2.2 Order of Precedence

1) In the event of any discrepancy or conflict in the contents of the following documents, such documents shall take precedence and govern in the following order:

    a) any amendment or variation of the contract documents that is made in accordance with the General Conditions;

    b) any amendment issued prior to tender closing;

    c) Supplementary Conditions;

    d) General Conditions;

    e) the duly completed Bid and Acceptance Form when accepted;

    f) drawings and specifications.

    later dates shall govern within each of the above categories of documents.

2) In the event of any discrepancy or conflict in the information contained in the drawings and specifications, the following rules shall apply:

    a) specifications shall govern over drawings;

    b) dimensions shown in figures on a drawings shall govern where they differ from dimensions scaled from the same drawings; and

    c) drawings of larger scale govern over those of smaller scale.

GC1.2.3 Security and Protection of Documents and Work

1) The Contractor shall guard and protect contract documents, drawings, information, models and copies thereof, whether supplied by Canada or the Contractor, against loss or damage from any cause.

2) The Contractor shall keep confidential all information provided to the Contractor by or on behalf of Canada in connection with the Work, and all information developed by the Contractor as part of the Work, and shall not disclose any such information to any person without the written permission of Canada, except that the Contractor may disclose to a subcontractor, authorized in accordance with the Contract, information necessary to the performance of a subcontract. This section does not apply to any information that

    a) is publicly available from a source other than the Contractor; or

b) is or becomes known to the Contractor from a source other than Canada, except any source that is known to the Contractor to be under an obligation to Canada not to disclose the **information.**

3) When the Contract, the Work, or any information referred to in paragraph 2) is identified as top secret, secret, confidential, or protected by Canada, the Contractor shall, at all times, take all measures reasonably necessary for the safeguarding of the material so identified, including such measures as may be further specified elsewhere in the Contract or provided, in writing, from time to time by Canada.

4) Without limiting the generality of paragraphs 2) and 3) of GC1.2.3, when the Contract, the Work, or any information referred to in paragraph 2) is identified as top secret, secret, confidential, or protected by Canada, Canada shall be entitled to inspect the Contractor's premises and the premises of its subcontractors or suppliers and any other person at any tier, for security purposes at any time during the term of the Contract, and the Contractor shall comply with, and ensure that any such subcontractors or suppliers comply with all written instructions issued by Canada dealing with the material so identified, including any requirement that employees of the Contractor and its subcontractors and suppliers and any other person at any tier execute and deliver declarations relating to reliability screenings, security clearances and other procedures.

5) The Contractor shall safeguard the Work and the Contract, the specifications, drawings and any other information provided by Canada to the Contractor, and shall be liable to Canada for any loss or damage from any causes.

GC1.3 STATUS OF THE CONTRACTOR

1) The Contractor is engaged under the Contract as an independent contractor.

2) The Contractor, its subcontractors and suppliers and any other person at any tier and their employees are not engaged by the Contract as employees, servants or agents of Canada.

3) For the purposes of the contract the Contractor shall be solely responsible for any and all payments and deductions required to be made by law including those required for Canada or Quebec Pension Plans, Employment Insurance, Worker's Compensation, provincial health or insurance plans, and Income Tax.

GC1.4 (2016-05-01) RIGHTS AND REMEDIES

1) Except as expressly provided in the Contract, the duties and obligations imposed by the Contract and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.

GC1.5 (2016-05-01) TIME OF THE ESSENCE

1) Time is of the essence of the Contract.

GC1.6 INDEMNIFICATION BY THE CONTRACTOR

1) The Contractor shall pay all royalties and patent fees required for the performance of the Contract and, at the Contractor's expense, shall defend all claims, actions or proceedings

against Canada charging or claiming that the Work or any part thereof provided or furnished by the Contractor to Canada infringes any patent, industrial design, copyright trademark, trade secret or other proprietary right enforceable in Canada.

2) The Contractor shall indemnify and save Canada harmless from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings by any third party, brought or prosecuted and in any manner based upon, arising out of, related to, occasioned by, or attributable to the activities of the Contractor, its subcontractors and suppliers and any other person at any tier, in performing the Work.

3) For the purposes of paragraph 2) of GC1.6, "activities" means any act improperly carried out, any omission to carry out an act and any delay in carrying out an act.

GC1.7 (2016-05-01) INDEMNIFICATION BY CANADA

1) Subject to the **Crown Liability and Proceedings Act, the Patent Act**, and any other law that affects Canada's rights, powers, privileges or obligations, Canada shall indemnify and save the Contractor harmless from and against all claims, demands, losses, costs, damage, actions, suits or proceedings arising out of the Contractor's activities under the Contract that are directly attributable to

   a) a lack of or a defect in Canada's title to the Work site if owned by Canada, whether real or alleged; or

   b) an infringement or an alleged infringement by the Contractor of any patent of invention or any other kind of intellectual property occurring while the Contractor was performing any act for the purposes of the Contract employing a model, plan or design or any other thing related to the Work that was supplied by Canada to the Contractor.

GC1.8 (2016-05-01) LAWS, PERMITS AND TAXES

1) The Contractor shall comply with all federal, provincial and municipal laws and regulations applicable to the performance of the Work or any part thereof including, without limitation, all laws concerning health and the protection of the environment, 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. The Contractor shall furnish evidence of compliance with such laws and regulations to Canada at such times as Canada may reasonably request.

2) Unless stipulated otherwise in the Contract, the Contractor shall obtain and maintain all permits, certificates, licences, registrations and authorizations required for the lawful performance of the Work.

3) Prior to the commencement of the Work at the site, the Contractor shall tender to a municipal authority an amount equal to all fees and charges that would be lawfully payable to that municipal authority in respect of building permits as if the Work were being performed for an owner other than Canada.

4) Within 10 days of making a tender pursuant to paragraph 3) of GC1.8, the Contractor shall notify Canada of the amount properly tendered and whether or not the municipal authority has accepted that amount.

5) If the municipal authority has not accepted the amount tendered, the Contractor shall pay that amount to Canada within 6 days after the time stipulated in paragraph 4) of GC1.8.

6) For the purposes of this clause, "municipal authority" means any authority that would have jurisdiction respecting permission to perform the Work if the owner were not Canada.

7) Notwithstanding the residency of the Contractor, the Contractor shall pay any applicable tax arising from or related to the performance of the Work under the Contract.

8) In accordance with the Statutory Declaration referred to in paragraph 4) of GC5.5, "Substantial Performance of the Work", a Contractor who has neither residence nor place of business in the province or territory in which work under the Contract is being performed shall provide Canada with proof of registration with the provincial sales tax authorities in the said province.

9) For the purpose of the payment of any Applicable Taxes or the furnishing of security for the payment of any Applicable Taxes arising from or related to the performance of the Work, and notwithstanding the provision that all Material, Plant and interest of the Contractor in all real property, licences, powers and privileges, become the property of Canada after the time of purchase in accordance with GC3.10, "Material Plant and Real Property Become Property of Canada", the Contractor shall be liable, as a user or consumer, for the payment or for the furnishing of security for the payment of any Applicable Taxes payable, at the time of the use or consumption of that Material, Plant or interest of the Contractor in accordance with the relevant legislation.

10) Federal government departments and agencies are required to pay Applicable Taxes.

11) Applicable Taxes will be paid by Canada as provided in the request for payment. 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.

12) 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.

13) In those cases where Applicable Taxes, customs duties, and excise taxes are included in the Contract Amount, the Contract Amount will be adjusted to reflect any increase, or decrease, of Applicable Taxes, customs duties, and excise taxes that will have occurred between bid submission and contract award. However, there will be no adjustment for any change to increase the Contract Amount if public notice of the change was given before bid submission date in sufficient detail to have permitted the Contractor to calculate the effect of the change.

14) Tax Withholding of 15 Percent – Canada Revenue Agency
Pursuant to the *Income Tax Act*, 1985, c. 1 (5th Supp.) and the *Income Tax Regulations*, Canada must withhold 15 percent of the amount to be paid to the Contractor in respect of services provided in Canada if the Contractor is not a resident of Canada, unless the Contractor obtains a valid waiver from the Canada Revenue Agency. The amount withheld will be held on account for the Contractor in respect to any tax liability which may be owed to Canada.

GC1.9 WORKERS' COMPENSATION

1) Prior to commencement of Work, at the time of Substantial Performance of the Work, and prior to issuance of the Certificate of Completion, the Contractor shall provide evidence of compliance with workers' compensation legislation applicable to the place of the Work, including payments due thereunder.

2) At any time during the term of the Contract, when requested by Canada, the Contractor shall provide such evidence of compliance by the Contractor, its subcontractors and any other person at any tier and any other person performing part of the Work who is required to comply with such legislation.

GC1.10 NATIONAL SECURITY

1) If Canada determines that the Work is of a class or kind that involves national security, Canada may order the Contractor to

   (a) provide Canada with any information concerning persons employed or to be employed by the Contractor for purposes of the Contract; and

   (b) remove any person from the site of the Work if, in the opinion of Canada, that person may be a risk to the national security;

   and the Contractor shall comply with the order.

2) In all contracts with persons who are to be employed in the performance of the Contract, the Contractor shall make provision for the performance of any obligation that may be imposed upon the Contractor under paragraph 1) of GC1.10.

GC1.11 (2016-05-01) UNSUITABLE WORKERS

1) Canada shall instruct the Contractor to remove from the site of the Work any person employed by the Contractor for purposes of the Contract who, in the opinion of Canada, is incompetent or is guilty of improper conduct, and the Contractor shall not permit a person who has been removed to return to the site of the Work.

GC1.12 PUBLIC CEREMONIES AND SIGNS

1) The Contractor shall not permit any public ceremony in connection with the Work without the prior consent of Canada.

2) The Contractor shall not erect nor permit the erection of any sign or advertising on the Work or its site without the prior consent of Canada.

GC1.13 (2016-05-01) CONFLICT OF INTEREST

1) It is a term of the Contract that no individual, for whom the post-employment provisions of the Conflict of Interest and Post-Employment Code for Public Office Holders or the Values and Ethics Code for the Public Service apply, shall derive a direct benefit from the Contract unless that individual is in compliance with the applicable post-employment provisions.

GC1.14 AGREEMENTS AND AMENDMENTS

1) The Contract constitutes the entire and sole agreement between the parties with respect to the subject matter of the Contract and supersedes all previous negotiations, communications and other agreements, whether written or oral, relating to it, unless they are incorporated by reference in the Contract. There are no terms, covenants, representations, statements or conditions binding on the parties other than those contained in the Contract.

2) The failure of either party at any time to require performance by the other party of any provision hereof shall not affect the right thereafter to enforce such provision. Nor shall the waiver by either party of any breach of any covenant, term or condition hereof be taken to be held to be a waiver of any further breach of the same covenant, term or condition.

3) The Contract may be amended only as provided for in the Contract.

GC1.15 (2016-05-01) SUCCESSION

1) The Contract shall inure to the benefit of and be binding upon the parties hereto and their lawful heirs, executors, administrators, successors and, subject to GC1.16, "Assignment", permitted assigns.

GC1.16 (2016-05-01) ASSIGNMENT

1) The Contractor shall not make any assignment of the Contract, either in whole or in part, without the written consent of Canada.

GC1.17 (2016-05-01) NO BRIBE

1) The Contractor represents and covenants that no bribe, gift, benefit, nor other inducement has been nor shall be paid, given, promised or offered directly or indirectly to any official or employee of Canada or to a member of the family of such a person, with a view to influencing the entry into the Contract or the administration of the Contract.

GC1.18 CERTIFICATION - CONTINGENCY FEES

1) In this clause

   (a) "contingency fee" means any payment or other compensation that is contingent upon or is calculated upon the basis of a degree of success in soliciting or obtaining a Government contract or negotiating the whole or any part of its terms;

   (b) "employee" means a person with whom the Contractor has an employer/employee relationship; and

   (c) "person" includes an individual or a group of individuals, a corporation, a partnership, an organization and an association and, without restricting the generality of the foregoing, includes any individual who is required to file a return with the registrar pursuant to section 5 of the **Lobbying Act** R.S.C. 1985 c.44 (4th Supplement) as the same may be amended from time to time.

2) The Contractor certifies that it has not directly or indirectly paid nor agreed to pay and covenants that it shall not directly or indirectly pay nor agree to pay a contingency fee for the solicitation, negotiation or obtaining of the Contract to any person other than an employee acting in the normal course of the employee's duties.

3) All accounts and records pertaining to payments of fees or other compensation for the solicitation, obtaining or negotiation of the Contract shall be subject to the accounts and audit provisions of the Contract.

4) If the Contractor certifies falsely under this section or is in default of the obligations contained therein, Canada may either take the Work out of the Contractor's hands in accordance with the provisions of the Contract or recover from the Contractor by way of reduction to the Contract Amount or otherwise, the full amount of the contingency fee.

GC1.19 INTERNATIONAL SANCTIONS

1) Persons and companies in Canada, and Canadians outside of Canada are bound by economic sanctions imposed by Canada. As a result, the Government of Canada cannot accept delivery of goods or services that originate, either directly or indirectly, from the countries or persons subject to **economic sanctions** (http://www.international.gc.ca/sanctions/index.aspx?lang=eng)

2) It is a condition of the Contract that the Contractor not supply to the Government of Canada any goods or services which are subject to economic sanctions.

3) By law, the Contractor must comply with changes to the regulations imposed during the life of the Contract. During the performance of the Contract should the imposition of sanctions against a country or person or the addition of a good or service to the list of sanctioned goods or services cause an impossibility of performance for the Contractor, the Contractor may request that the Contract be terminated in accordance with GC7.3 TERMINATION OF CONTRACT.

GC1.20 (2016-05-01) INTEGRITY PROVISIONS – CONTRACT

1) The Ineligibility and Suspension Policy (the “Policy”) and all related Directives are incorporated into, and form a binding part of the Contract. The Contractor must comply with the provisions of the Policy and Directives, which can be found on Public Works and Government Services Canada’s website at Ineligibility and Suspension Policy. (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html).

GC1.21 (2016-05-01) CODE OF CONDUCT FOR PROCUREMENT - CONTRACT

1) The Contractor agrees to comply with the Code of Conduct (http://www.tpsgc-pwgsc.gc.ca/app-acq/cndt-cndct/contexte-context-eng.html) for Procurement and to be bound by its terms for the period of the Contract.

GC2 ADMINISTRATION OF THE CONTRACT

GC2.1 (2016-05-01) DEPARTMENTAL REPRESENTATIVE'S AUTHORITY

"Technical **Authority" shall be recognized as the Departmental representative and designated at time of award of contract and shall perform the following:**

a) is responsible **for all matters concerning the technical content of the work under the contract;**

b) authorized to issue notices, instructions, and changes within the scope of the Work, relevant to the contract.

c) accept on behalf of Canada any notice, order or other communication from the contractor relating to the Work

d) within a reasonable time, review and respond to submissions made by the Contractor in accordance with the requirements of the Contract

The technical authority has no authority to authorize changes to the Contract terms and conditions of the Contract.

"Contracting Authority" shall be recognized as the authority delegated by the Minister of AAFC to enter into contracts, amend the contracts and is responsible for all matters concerning and interpretation of the terms and conditions of the Contract.

The contracting authority is responsible for the management of the Contract and any changes to the Contract terms **and conditions must be authorized in writing by the Contracting Authority.**

GC2.2 INTERPRETATION OF CONTRACT

1) If, at any time before Canada has issued a Certificate of Completion, any question arises between the parties about whether anything has been done as required by the Contract or about what the Contractor is required by the Contract to do, and in particular but without limiting the generality of the foregoing, about

   (a) the meaning of anything in the drawings and specifications;

   (b) the meaning to be given to the drawings and specifications in case of any error therein, omission therefrom, or obscurity or discrepancy in their wording or intention;

(c) whether or not the quality or quantity of any Material or workmanship supplied or proposed to be supplied by the Contractor meets the requirements of the Contract;

(d) whether or not the labour, Plant or Material performed, used and supplied by the Contractor for performing the Work and carrying out the Contract are adequate to ensure that the Work shall be performed in accordance with the Contract and that the Contract shall be carried out in accordance with its terms;

(e) what quantity of any of the Work has been completed by the Contractor; or

(f) the timing and scheduling of the various phases of the performance of the Work as specified in the Contract;

the question shall be decided, subject to the provisions of GC8 DISPUTE RESOLUTION, by Canada.

2) The Contractor shall perform the Work in accordance with any decisions of Canada that are made under paragraph 1) of GC2.2 and in accordance with any consequential directions given by Canada.

3) If the Contractor fails to comply with any instruction or direction issued by Canada pursuant to the Contract, Canada may employ such methods as Canada deems advisable to do what the Contractor failed to do, and the Contractor shall, on demand, pay Canada an amount that is equal to the aggregate of all costs, expenses and damages incurred or sustained by Canada by reason of the Contractor's failure to comply with such instruction or direction, including the cost of any methods employed by Canada in doing what the Contractor failed to do.

GC2.3 NOTICES

1) Subject to paragraph 3) of GC2.3, any notice, order or other communication may be given in any manner, and if required to be in writing, shall be addressed to the party to whom it is intended at the address in the Contract or at the last address of which the sender has received written notice in accordance with this section.

2) Any notice, order or other communication given in writing in accordance with paragraph 1) of GC2.3 shall be deemed to have been received by either party

(a) if delivered personally, on the day that it was delivered;

(b) if forwarded by mail, on the earlier of the day it was received or the sixth day after it was mailed; and

(c) if forwarded by facsimile or electronic mail, 24 hours after it was transmitted.

3) A notice given under GC7.1 TAKING THE WORK OUT OF THE CONTRACTOR’S HANDS, GC7.2 SUSPENSION OF WORK, and GC7.3 TERMINATION OF CONTRACT shall be given in writing and, if delivered personally, shall be delivered, if the Contractor is a sole proprietor, to the Contractor or, if the Contractor is a partnership or corporation, to an officer thereof.

GC2.4 (2016-05-01) SITE MEETINGS

1) In consultation with Canada, the Contractor shall arrange site meetings at regular intervals, with all involved parties who are to attend, in order to ensure, among other things, the proper co-ordination of the Work.

GC2.5 REVIEW AND INSPECTION OF WORK

1) Canada shall review the Work to determine if it is proceeding in conformity with the Contract and to record the necessary data to make an assessment of the value of Work completed. Canada shall measure and record the quantities of labour, Plant and Material performed, used or supplied by the Contractor in performing the Work or any part thereof that is subject to a Unit Price Arrangement and, on request, shall inform the Contractor of those measurements, and permit the Contractor to inspect any records pertaining thereto.

2) Canada shall reject Work or Material which in Canada's opinion does not conform to the requirements of the Contract, and shall require inspection or testing of Work, whether or not such Work is fabricated, installed, or completed. If such Work is not in accordance with the requirements of the Contract, the Contractor shall correct the Work and shall pay Canada, on demand, all reasonable costs and expenses that were incurred by Canada in having the examination performed.

3) The Contractor shall provide Canada with access to the Work and its site at all times, and at all times shall provide sufficient, safe, and proper facilities for the review and inspection of the Work by persons authorized by Canada and any representatives of those authorities having jurisdiction. If parts of the Work are in preparation at locations other than the site of the Work, Canada shall be given access to such Work whenever it is in progress.

4) The Contractor shall furnish Canada with such information respecting the performance of the Contract as Canada may require, and render every possible assistance to enable Canada to verify that the Work is performed in accordance with the Contract, carry out any other duties and exercise any powers in accordance with the Contract.

5) If Work is designated for tests, inspections, or approvals in the Contract or by Canada's instructions, or by laws or ordinances of the place of the Work, the Contractor shall give Canada reasonable notice of when such Work shall be ready for review and inspection. The Contractor shall arrange for and shall give Canada reasonable notice of the date and time of inspections, tests or approvals.

6) If the Contractor covers, or permits to be covered, Work that has been designated for tests, inspections or approvals before such tests, inspections or approvals are made, completed or given, the Contractor shall, if so directed by Canada, uncover such Work, have the inspections, tests or approvals satisfactorily made, completed or given and make good the covering of the Work at the Contractor's expense.

GC2.6 SUPERINTENDENT

1) Prior to commencing the Work, the Contractor shall designate a Superintendent and shall notify Canada of the name, address and telephone number of the Superintendent. The Contractor shall keep the Superintendent at the Work site during working hours until the Work has reached completion.

2) The Superintendent shall be in full charge of the operations of the Contractor during the performance of the Work and shall be authorized to accept on behalf of the Contractor any notice, order or other communication given to the Superintendent or the Contractor relating to the Work.

3) Upon request of Canada, the Contractor shall remove any Superintendent who, in the opinion of Canada, is incompetent or has been guilty of improper conduct, and shall forthwith designate another Superintendent who is acceptable to Canada.

4) The Contractor shall not substitute a Superintendent without the written consent of Canada. If a Superintendent is substituted without such consent, Canada shall be entitled to refuse to issue any documentation or certification relating to progress payments, Substantial Performance or Completion of the Work until the Superintendent has returned to the Work site or another Superintendent who is acceptable to Canada has been substituted.

GC2.7 (2016-05-01) NON-DISCRIMINATION IN HIRING AND EMPLOYMENT OF LABOUR

1) For the purposes of this clause, "persons" include the Contractor, its subcontractors and suppliers at any tier and their respective employees, agents, licensees or invitees and any other individual involved in the performance of the Work or granted access to the Work site. A "person" includes any partnership, proprietorship, firm, joint venture, consortium and corporation.

2) Without restricting the provisions of paragraph 3) of GC2.6, "Superintendent", the Contractor shall not refuse to employ and shall not discriminate in any manner against any person because

   a) of that person's race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, disability, conviction for which a pardon has been granted, or family status;

   b) of the race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, disability, conviction for which a pardon has been granted, or family status of any person having a relationship or association with that person, or

   c) a complaint has been made or information has been given in respect of that person relating to an alleged failure by the Contractor to comply with subparagraph (a) or (b).

3) Within two working days immediately following receipt of a written complaint pursuant to paragraph 2) of GC2.7, the Contractor shall

   a) cause to have issued a written direction to the person or persons named by the complainant to cease all actions that form the basis of the complaint;

   b) forward a copy of the complaint to Canada by registered mail or courier service.

4) Within 24 hours immediately following receipt of a direction from Canada to do so, the Contractor shall cause to have removed from the site of the Work and from the performance of Work under the Contract, any person or persons whom Canada believes to be in breach of the provisions of paragraph 2) of GC2.7.

5) No later than 30 days after receipt of the direction referred to in paragraph 4) of GC2.7, the Contractor shall cause the necessary action to be commenced to remedy the breach described in the direction.

6) If a direction is issued pursuant to paragraph 4) of GC2.7, Canada may withhold from monies that are due and payable to the Contractor or setoff pursuant to GC5.9, "Right of Setoff", whichever is applicable, an amount representing the sum of the costs and payment referred to in paragraph 8) of GC2.7.

7) If the Contractor fails to proceed in accordance with paragraph 5) of GC2.7, Canada shall take the necessary action to have the breach remedied, and shall determine all supplementary costs incurred by Canada as a result.

8) Canada may make a payment directly to the complainant from monies that are due and payable to the Contractor upon receipt from the complainant of

   a) a written award issued pursuant to the federal **Commercial Arbitration Act**, R.S. 1985, c. 17 (2nd Supp.);
   b) a written award issued pursuant to the **Canadian Human Rights Act**, R.S. 1985, c. H-6;
   c) a written award issued pursuant to provincial or territorial human rights legislation; or
   d) a judgement issued by a court of competent jurisdiction.

9) If Canada is of the opinion that the Contractor has breached any of the provisions of this clause, Canada may take the Work out of the Contractor's hands pursuant to GC7.1, "Taking the Work out of the Contractor's Hands".

10) Subject to paragraph 7) of GC3.6, "Subcontracting", the Contractor shall ensure that the provisions of this clause are included in all agreements and contracts entered into as a consequence of the Work.

GC2.8 (2016-05-01) ACCOUNTS AND AUDITS

1) The Contractor shall, in addition to the requirements expressed in paragraph 6) of GC3.4, "Execution of the Work", maintain full records of the Contractor's estimated and actual cost of the Work together with all tender calls, quotations, contracts, correspondence, invoices, receipts and vouchers relating thereto, and shall make them available on request to audit and inspection by Canada and the Deputy Receiver General for Canada or by persons designated to act on behalf of either or both of them.

2) The Contractor shall allow any of the persons referred to in paragraph 1) of GC2.8 to make copies of and take extracts from any of the records and material, and shall furnish such persons or entities with any information those persons or entities may require from time to time in connection with such records and material.

3) The Contractor shall maintain and keep the records intact until the expiration of six (6) years after the date that a Certificate of Completion has been issued or until the expiration of such other period of time as Canada may direct.

4) The Contractor shall cause all subcontractors at any tier and all other persons directly or indirectly controlled by or affiliated with the Contractor and all persons directly or indirectly having control of the Contractor to comply with the requirements of this clause as if they were the Contractor.

GC3 EXECUTION AND CONTROL OF THE WORK

GC3.1 (2016-05-01) PROGRESS SCHEDULE

The Contractor shall

a) prepare and submit to Canada, prior to the submission of the Contractor's first progress claim, a progress schedule in accordance with the requirements set out in the Contract;

b) monitor the progress of the Work relative to the schedule and update the schedule as stipulated by the contract documents;

c) advise Canada of any revisions to the schedule required as the result of any extension of time for completion of the Contract that was approved by Canada; and

d) prepare and submit to Canada, at the time of issuance of a Certificate of Substantial Performance, an update of any schedule clearly showing a detailed timetable that is acceptable to Canada for the completion of any unfinished Work and the correction of all listed defects.

GC3.2 (2016-05-01) ERRORS AND OMISSIONS

1) The Contractor shall report promptly to Canada any errors, discrepancies, or omissions the Contractor may discover when reviewing the contract documents. In making a review, the Contractor does not assume any responsibility to Canada for the accuracy of the review. The Contractor shall not be liable for damage or costs resulting from such errors, discrepancies, or omissions in the contract documents prepared by or on behalf of Canada that the Contractor did not discover.

GC3.3 CONSTRUCTION SAFETY

1) Subject to GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS, the Contractor shall be solely responsible for construction safety at the place of the Work and for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Work. In any emergency, the Contractor shall either stop the Work,

make changes or order extra work to ensure the safety of life and the protection of the Work and neighbouring property.

2) Prior to commencing the Work, the Contractor shall notify the authorities having jurisdiction for construction safety at the site of the Work with respect to the intended commencement of the Work, and shall provide such authority with whatever additional information may be required by that authority.

GC3.4 EXECUTION OF THE WORK

1) The Contractor shall perform, use or supply and pay for, all labour, Plant, Material, tools, construction machinery and equipment, water, heat, light, power, transportation and other facilities and services necessary for the performance of the Work in accordance with the Contract.

2) The Contractor shall, at all times, perform the Work in a proper, diligent and expeditious manner as is consistent with construction industry standards and in accordance with the progress schedule prepared pursuant to GC3.1 PROGRESS SCHEDULE and shall provide sufficient personnel to fulfil the Contractor's obligations in accordance with that schedule.

3) Subject to paragraph 4) of GC3.4, the Contractor shall have complete care, custody and control of the Work and shall direct and supervise the Work so as to ensure compliance with the Contract. The Contractor shall be responsible for construction means, methods, techniques, sequences and procedures and for co-ordinating the various parts of the Work.

4) When requested in writing by Canada, the Contractor shall make appropriate alterations in the method, Plant or workforce at any time Canada considers the Contractor's actions to be unsafe or damaging to either the Work, existing facilities, persons at the site of the Work or the environment.

5) The Contractor shall have sole responsibility for the design, erection, operation, maintenance and removal of temporary structures and other temporary facilities and for the construction methods used in their erection, operation, maintenance and removal. The Contractor shall engage and pay for registered professional engineering personnel, skilled in the appropriate discipline to perform these functions if required by law or by the Contract, and in all cases when such temporary facilities and their methods of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results.

6) The Contractor shall keep at least one copy of current contract documents, submittals, reports, and records of meetings at the site of the Work, in good order and available to Canada.

7) Except for any part of the Work that is necessarily performed away from or off the site of the Work, the Contractor shall confine Plant, storage of Material, and operations of employees to limits indicated by laws, ordinances, permits or the contract documents.

GC3.5 MATERIAL

1) Unless otherwise specified in the Contract, all Material incorporated in the Work shall be new.

2) Subject to paragraph 3) of GC3.5, if a specified reused, refurbished, or recycled item of Material is not available, the Contractor shall apply to Canada to substitute a similar item for the one specified.

3) If Canada agrees that the Contractor's application for substitution of a reused, refurbished or recycled item is warranted, and that the substitute item is of acceptable quality and value to that specified and is suitable for the intended purpose, Canada may approve the substitution, subject to the following:

   (a) the request for substitution shall be made in writing to Canada and shall be substantiated by information in the form of the manufacturer's literature, samples and other data that may be required by Canada;

   (b) the Contractor shall make the request for substitution in a manner that shall not negatively affect the progress schedule of the Contract and well in advance of the time the item of Material must be ordered;

   (c) substitution of Material shall be permitted only with the prior written approval of Canada, and any substituted items that are supplied or installed without such approval shall be removed from the site of the Work at the expense of the Contractor, and specified items installed at no additional cost to Canada; and

   (d) the Contractor shall be responsible for all additional expenses incurred by Canada, the Contractor, its subcontractors and suppliers at any tier due to the Contractor's use of the substitute.

GC3.6 SUBCONTRACTING

1) Subject to the provisions of this clause, the Contractor may subcontract any part of the Work but not the whole of the Work.

2) The Contractor shall notify Canada in writing of the Contractor's intention to subcontract.

3) A notification referred to in paragraph 2) of GC3.6 shall identify the part of the Work and the Subcontractor with whom the Contractor intends to subcontract.

4) Canada may for reasonable cause, object to the intended subcontracting by notifying the Contractor in writing within six (6) days of receipt by Canada of a notification referred to in paragraph 2) of GC3.6.

5) If Canada objects to a subcontracting, the Contractor shall not enter into the intended subcontract.

6) The Contractor shall not change, nor permit to be changed, a Subcontractor engaged by the Contractor, in accordance with this clause, without the written consent of Canada.

7) The Contractor shall ensure that all the terms and conditions of the Contract that are of general application shall be incorporated in every other contract issued as a consequence of the Contract, at whatever tier, except those contracts issued solely to suppliers at any tier for the supply of Plant or Material.

8) Neither a subcontracting nor Canada's consent to a subcontracting shall be construed to relieve the Contractor from any obligation under the Contract or to impose any liability upon Canada.

GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS

1) Canada reserves the right to send other contractors or workers, with or without Plant and Material, onto the site of the Work.

2) When other contractors or workers are sent on to the site of the Work, Canada shall

   (a) enter into separate contracts, to the extent it is possible, with the other contractors under conditions of contract that are compatible with the conditions of the Contract;

   (b) ensure that the insurance coverage provided by the other contractors is co-ordinated with the insurance coverage of the Contractor as it affects the Work; and

   (c) take all reasonable precautions to avoid labour disputes or other disputes arising from the work of the other contractors or workers.

3) When other contractors or workers are sent on to the site of the Work, the Contractor shall

   (a) co-operate with them in the carrying out of their duties and obligations;

   (b) co-ordinate and schedule the Work with the work of the other contractors and workers;

   (c) participate with other contractors and workers in reviewing their construction schedules when directed to do so;

   (d) where part of the Work is affected by or depends upon the work of other contractors or workers for its proper execution, promptly report to Canada in writing and prior to proceeding with that part of the Work, any apparent deficiencies in such work. Failure by the Contractor to so report shall invalidate any claims against Canada by reason of the deficiencies in the work of other contractors or workers except those deficiencies that are not then reasonably discoverable; and

   (e) when designated as being responsible for construction safety at the place of work in accordance with the applicable provincial or territorial laws, carry out its duties in that role and in accordance with those laws.

4) If, when entering into the Contract, the Contractor could not have reasonably foreseen nor anticipated the sending of other contractors or workers on to the site of the Work and provided the Contractor

   (a) incurs extra expense in complying with the requirements of paragraph 3) of GC3.7; and

   (b) gives Canada written notice of a claim for that extra expense within thirty (30) days of the date that the other contractors or workers were sent onto the Work or its site;

   Canada shall pay the Contractor the cost of the extra labour, Plant and Material that was necessarily incurred, calculated in accordance with GC6.4 DETERMINATION OF PRICE.

GC3.8 LABOUR

1) To the extent to which they are available, consistent with proper economy and the expeditious carrying out of the Work, the Contractor shall, in the performance of the Work, employ a reasonable number of persons who have been on active service with the Armed Forces of Canada and have been honourably discharged therefrom.

2) The Contractor shall maintain good order and discipline among the Contractor's employees and workers engaged in the Work and shall not employ on the site of the Work anyone not skilled in the tasks assigned.

GC3.9 TRUCK HAULAGE RATES

CANCELLED

GC3.10 MATERIAL, PLANT AND REAL PROPERTY BECOME PROPERTY OF CANADA

1) Subject to paragraph 9) of GC1.8 LAWS PERMITS AND TAXES, all Material and Plant and the interest of the Contractor in all real property, licences, powers and privileges purchased, used or consumed by the Contractor for the Work shall, immediately after the time of their purchase, use or consumption be the property of Canada for the purposes of the Work and they shall continue to be the property of Canada

   (a) in the case of Material, until Canada indicates that the Materials shall not be required for the Work; and

   (b) in the case of Plant, real property, licences, powers and privileges, until Canada indicates that the interest vested in Canada therein is no longer required for the purposes of the Work.

2) Material or Plant, that is the property of Canada by virtue of paragraph 1) of GC3.10, shall not be taken away from the site of the Work nor used nor disposed of except for the purposes of the Work without the written consent of Canada.

3) Canada is not liable for loss of nor damage from any cause to the Material or Plant referred to in paragraph 1) of GC3.10, and the Contractor is liable for such loss or damage notwithstanding that the Material or Plant is the property of Canada.

GC3.11 DEFECTIVE WORK

1) The Contractor shall promptly remove from the site of the Work and replace or re-execute defective Work whether or not the defective Work has been incorporated in the Work and whether or not the defect is the result of poor workmanship, use of defective Material, or damage through carelessness or other act or omission of the Contractor.

2) The Contractor, at the Contractor's expense, shall promptly make good other work destroyed or damaged by such removals or replacements.

3) If, in the opinion of Canada, it is not expedient to correct defective Work or Work not performed as provided for in the Contract documents, Canada may deduct from the amount otherwise due to the Contractor the difference in value between the Work as performed and that called for by the contract documents.

4) The failure of Canada to reject any defective Work or Material shall not constitute acceptance of the defective Work or Material.

GC3.12 CLEANUP OF SITE

1) The Contractor shall maintain the Work and its site in a tidy condition and free from an accumulation of waste material and debris.

2) Before the issue of a Certificate of Substantial Performance, the Contractor shall remove waste material and debris, and all Plant and Material not required for the performance of the remaining Work and, unless otherwise stipulated in the Contract Documents, shall cause the Work and its site to be clean and suitable for occupancy by Canada.

3) Before the issue of a Certificate of Completion, the Contractor shall remove all surplus Plant and Materials and any waste products and debris from the site of the Work.

4) The Contractor's obligations described in paragraphs 1) to 3) of GC3.12 do not extend to waste products and other debris caused by Canada's servants, or by other contractors and workers referred to in GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS.

GC3.13 WARRANTY AND RECTIFICATION OF DEFECTS IN WORK

1) Without restricting any warranty or guarantee implied or imposed by law or contained in the Contract, the Contractor shall, at the Contractor's expense

   (a) rectify and make good any defect or fault that appears in the Work or comes to the attention of Canada with respect to those parts of the Work accepted in connection with the Certificate of Substantial Performance within 12 months from the date of Substantial Performance; and

   (b) rectify and make good any defect or fault that appears in or comes to the attention of Canada in connection with those parts of the Work described in the Certificate of Substantial Performance within 12 months from the date of the Certificate of Completion.

   (c) transfer and assign, to Canada, any subcontractor, manufacturer or supplier extended warranties or guarantees implied or imposed by law or contained in the Contract covering periods beyond the 12 months stipulated above. Extended warranties or guarantees referred to herein shall not extend the 12-month period whereby the Contractor, except as may be provided elsewhere in the Contract, must rectify and make good any defect or fault that appears in the Work or comes to the attention of Canada.

   (d) provide, to Canada prior to the issuance of the Certificate of Completion, a list of all extended warranties and guarantees referred to in paragraph (c) above.

2) Canada may direct the Contractor to rectify and make good any defect or fault referred to in paragraph 1) of GC3.13 or covered by any other expressed or implied warranty or guarantee and the Contractor shall rectify and make good such defect within the time stipulated in the direction.

3) A direction referred to in paragraph 2) GC3.13 shall be in writing and shall be given to the Contractor in accordance with GC2.3 NOTICES.

GC4 PROTECTIVE MEASURES

GC4.1 PROTECTION OF WORK AND PROPERTY

1) The Contractor shall protect the Work and its site against loss or damage from any cause and shall similarly protect all Material, Plant and real property under the Contractor's care, custody and control whether or not such Material, Plant and real property are supplied by Canada to the Contractor.

2) The Contractor shall provide all facilities necessary for the purpose of maintaining security, and shall assist any person authorized by Canada to inspect or to take security measures in respect of the Work and its site.

3) Canada may direct the Contractor to do such things and to perform such work as Canada considers reasonable and necessary to ensure compliance with or to remedy a breach of paragraphs 1) or 2) of GC4.1, and the Contractor, shall comply with such direction.

GC4.2 PRECAUTIONS AGAINST DAMAGE, INFRINGEMENT OF RIGHTS, FIRE AND OTHER HAZARDS

1) The Contractor shall do whatever is necessary to ensure that

   (a) no person, property, right, easement nor privilege is injured, damaged or infringed upon by reasons of the Contractor's activities in performing the Work;

   (b) pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted nor endangered by the performance or existence of the Work, Material or Plant;

   (c) fire hazards in or about the site of the Work are eliminated and any fire is promptly extinguished;

   (d) the health and safety of all persons employed in the performance of the Work is not endangered by the methods nor means of their performance;

   (e) adequate medical services are available to all persons employed on the Work or its site at all times during the performance of the Work;

   (f) adequate sanitation measures are taken in respect of the Work and its site; and

   (g) all stakes, buoys and marks placed on the Work or its site by Canada are protected and are not removed, defaced, altered nor destroyed.

2) Canada may direct the Contractor to do such things and to perform such work as Canada considers reasonable and necessary to ensure compliance with or to remedy a breach of paragraph 1) of GC4.2, and the Contractor shall comply with the direction of Canada.

GC4.3 MATERIAL, PLANT AND REAL PROPERTY SUPPLIED BY CANADA

1) Subject to paragraph 2) of GC4.3, the Contractor is liable to Canada for any loss of or damage to Material, Plant or real property that is supplied or placed in the care, custody and control of the Contractor by Canada for use in connection with the Contract, whether or not that loss or damage is attributable to causes beyond the Contractor's control.

2) The Contractor is not liable to Canada for any loss or damage to Material, Plant or real property referred to in paragraph 1) of GC4.3 if that loss or damage results from and is directly attributable to reasonable wear and tear.

3) The Contractor shall not use any Material, Plant or real property supplied by Canada except for the purpose of performing the Contract.

4) When the Contractor fails to make good any loss or damage for which the Contractor is liable under paragraph 1) within a reasonable time, Canada may cause the loss or damage to be made good at the Contractor's expense, and the Contractor shall thereupon be liable to Canada for the cost thereof and shall, on demand, pay to Canada an amount equal to that cost.

5) The Contractor shall keep records of all Material, Plant and real property supplied by Canada as Canada requires and shall satisfy Canada, when requested, that such Material, Plant and real property are at the place and in the condition in which they ought to be.

GC4.4 CONTAMINATED SITE CONDITIONS

1) For the purposes of GC4.4, a contaminated site condition exists when a solid, liquid, gaseous, thermal or radioactive irritant or contaminant, or other hazardous or toxic substance or material, including moulds and other forms of fungi, is present at the site of the Work to an extent that constitutes a hazard, or potential hazard, to the environment, property, or the health or safety of any person.

2) If the Contractor encounters a contaminated site condition of which the Contractor is not aware or about which the Contractor has not been advised, or if the Contractor has reasonable grounds to believe that such a site condition exists at the site of the Work, the Contractor shall

   (a) take all reasonable steps, including stopping the Work, to ensure that no person suffers injury, sickness or death, and that neither property nor the environment is injured or destroyed as a result of the contaminated site condition;

   (b) immediately notify Canada of the circumstances in writing; and

   (c) take all reasonable steps to minimize additional costs that may accrue as a result of any work stoppage.

3) Upon receipt of a notification from the Contractor, Canada shall promptly determine whether a contaminated site condition exists, and shall notify the Contractor in writing of any action to be taken, or work to be performed, by the Contractor as a result of Canada's determination.

4) If the Contractor's services are required by Canada, the Contractor shall follow the direction of Canada with regard to any excavation, treatment, removal and disposal of any polluting substance or material.

5) Canada, at Canada's sole discretion, may enlist the services of experts and specialty contractors to assist in determining the existence of, and the extent and treatment of contaminated site conditions, and the Contractor shall allow them access and co-operate with them in the carrying out of their duties and obligations.

6) Except as may be otherwise provided for in the Contract, the provisions of GC6.4 DETERMINATION OF PRICE shall apply to any additional work made necessary because of a contaminated site condition.

GC5 TERMS OF PAYMENT

GC5.1 INTERPRETATION

In these Terms of Payment

1) The "payment period" means a period of 30 consecutive days or such other longer period as may be agreed between the Contractor and Canada.

2) An amount is "due and payable" when it is due and payable by Canada to the Contractor according to GC5.4 PROGRESS PAYMENT, GC5.5 SUBSTANTIAL PERFORMANCE OF THE WORK or GC5.6 FINAL COMPLETION.

3) An amount is “overdue” when it remains unpaid on the first day following the day upon which it is due and payable.

4) The "date of payment" means the date of the negotiable instrument of an amount due and payable by the Receiver General for Canada.

5) The "Bank Rate" means the rate of interest established by the Bank of Canada as the minimum rate at which it makes short term advances to members of the Canadian Payments Association.

6) The "Average Bank Rate" means the simple arithmetic mean of the Bank Rate in effect at 4:00 p.m. Eastern Time each day during the calendar month which immediately precedes the calendar month in which payment is made.

GC5.2 AMOUNT PAYABLE

1) Subject to any other provisions of the Contract, Canada shall pay the Contractor, at the times and in the manner hereinafter set out, the amount by which the amounts payable by Canada to the Contractor in accordance with the Contract exceed the amounts payable by the Contractor to Canada, and the Contractor shall accept that amount as payment in full satisfaction for everything furnished and done by the Contractor in respect of the Work to which the payment relates.

2) When making any payment to the Contractor, the failure of Canada to deduct an amount payable to Canada by the Contractor shall not constitute a waiver of the right to do so, or an admission of lack of entitlement to do so in any subsequent payment to the Contractor.

3) Should any payment be made by Canada in excess of what is owed to the Contractor for the actual work performed, the Contractor will reimburse Canada the excess immediately, with or without demand, and any amounts outstanding shall bear simple interest at the Average Bank rate plus 3 percent per annum from the date of overpayment until the day prior to the date of repayment by the Contractor.

4) No payment other than a payment that is expressly stipulated in the Contract shall be made by Canada to the Contractor for any extra expense or any loss or damage incurred or sustained by the Contractor.

GC5.3 (2016-05-01) INCREASED OR DECREASED COSTS

1. The Contract Amount shall not be increased nor decreased by reason of any increase or decrease in the cost of the Work that is brought about by an increase or decrease in the cost of labour, Plant, Material or any wage adjustment.

2. Notwithstanding paragraph 1) of GC5.3, if any change, including a new imposition or repeal, of any tax, customs or other duty, charge, or any similar imposition that is imposed under sales, customs 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

   a) after the date of submission by the Contractor of its bid; or

   b) after the date of submission of the last revision, if the Contractor's bid was revised;

   c) the Contract Amount shall be adjusted in the manner provided in paragraph 3) of GC5.3.

3. If a change referred to in paragraph 2) of GC5.3 occurs, the Contract Amount shall be increased or decreased by an amount established by an examination by Canada of the relevant records of the Contractor referred to in GC2.8, "Accounts and Audits", to be the increase or decrease in the cost incurred by the Contractor that is directly attributable to that change.

4. For the purpose of paragraph 2) of GC5.3, if a tax is changed after the tender closing, but public notice of the change has been given by the Minister of Finance or the corresponding Provincial or Territorial authority before that closing, the change shall be deemed to have occurred before the solicitation closing.

5. Notwithstanding paragraphs 2) to 4) of GC5.3, no adjustment to the Contract Amount in respect of the Work or a part thereof shall be made for a change in any imposition referred to in this section that occurs after the date required by the Contract for completion of the Work or that part of the Work.

GC5.4 (2016-05-01) PROGRESS PAYMENT

1) On the expiration of a payment period, the Contractor shall deliver to Canada

   a) a written progress claim in a form acceptable to Canada that fully describes any part of the Work that has been completed, and any Material that was delivered to the Work site but not incorporated into the Work, during that payment period, and

b) a completed and signed statutory declaration containing a declaration that, up to the date of the progress claim, the Contractor has complied with all lawful obligations and that, in respect of the Work, all lawful obligations of the Contractor to its Subcontractors and Suppliers, referred to collectively in the declaration as " subcontractors and suppliers", have been fully discharged.

2) Within 10 days of receipt of a progress claim and statutory declaration from the Contractor, Canada shall inspect, or cause to have inspected, the part of the Work and the Material described in the progress claim, and shall issue a progress report to the Contractor, that indicates the value of the part of the Work and the 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 relating to the Contract.

3) Subject to GC5.2, "Amount Payable", and paragraph 5) of GC5.4, Canada shall pay the Contractor an amount that is equal to

a) 95 percent of the value that is indicated in Canada's progress report if a labour and material payment bond has been furnished by the Contractor; or

b) 90 percent of the value that is indicated in Canada's progress report if a labour and material payment bond has not been furnished by the Contractor.

4) Canada shall pay the amount referred to in paragraph 3) of GC5.4 not later than

a) 30 days after receipt by Canada of both a progress claim and a statutory declaration referred to in paragraph 1) of GC5.4; or

b) 15 days after receipt by Canada of the Contractor's progress schedule or updated progress schedule, in accordance with GC3.1, "Progress Schedule",

whichever is later.

5) In the case of the Contractor's first progress claim, it is a condition precedent to Canada's obligation under paragraph 3) of GC5.4 that the Contractor has provided all necessary documentation required by the Contract for the first progress claim.

GC5.5 (2016-05-01) SUBSTANTIAL PERFORMANCE OF THE WORK

1. If, at any time before the issuance of a Certificate of Completion, Canada determines that the Work has reached Substantial Performance as described in subparagraph 1) (b) of GC1.1.4, "Substantial Performance", Canada shall issue a Certificate of Substantial Performance to the Contractor. The Certificate of Substantial Performance shall state or describe

a) the date of Substantial Performance;

b) the parts of the Work not completed to the satisfaction of Canada; and

c) all things that must be done by the Contractor before a Certificate of Completion is issued and before the 12-month warranty period referred to in GC3.13, "Warranty and Rectification of Defects in Work", commences for the said parts and all the said things.

2. The issuance of a Certificate of Substantial Performance does not relieve the Contractor from the Contractor's obligations under GC3.11, "Defective Work".

3. Subject to GC5.2, "Amount Payable", and paragraph 4) of GC5.5, Canada shall pay the Contractor the amount referred to in paragraph 1) of GC5.2, "Amount Payable", less the aggregate of

   a) the sum of all payments that were made pursuant to GC5.4, "Progress Payment";

   b) an amount that is equal to Canada's estimate of the cost to Canada of rectifying defects described in the Certificate of Substantial Performance; and

   c) an amount that is equal to Canada's estimate of the cost to Canada of completing the parts of the Work described in the Certificate of Substantial Performance other than defects listed therein.

4. Canada shall pay the amount referred to in paragraph 3) of GC5.5 not later than

   a) 30 days after the date of issue of a Certificate of Substantial Performance, or

   b) 15 days after the Contractor has delivered to Canada

      I. a statutory declaration containing a declaration by the Contractor that up to the date of the Certificate of Substantial Performance, the Contractor has complied with all lawful obligations, discharged all its lawful obligations to its Subcontractors and Suppliers in respect of the work under the Contract, and discharged its lawful obligations referred to in GC1.8, "Laws, Permits and Taxes";

      II. evidence of compliance with workers' compensation legislation in accordance with GC1.9, "Workers' Compensation"; and

      III. an update of the progress schedule in accordance with the requirements of GC3.1, "Progress Schedule"; whichever is later.

GC5.6 FINAL COMPLETION

1) When Canada is of the opinion that the Contractor has complied with the Contract and all orders and directions made pursuant thereto, and that the Work has been completed as described in GC1.1.5 COMPLETION, Canada shall issue a Certificate of Completion to the Contractor and, if the Work or a portion of the Work is subject to a Unit Price Arrangement, Canada shall issue a Certificate of Measurement that shall, subject to GC8, be binding upon and conclusive between Canada and the Contractor as to the quantities referred to therein.

2) Subject to GC5.2 AMOUNT PAYABLE and paragraph 3) of GC5.6, Canada shall pay the Contractor the amount referred to in GC5.2 AMOUNT PAYABLE, less the aggregate of the sum of all payments that were made pursuant to GC5.4 PROGRESS PAYMENT and GC5.5 SUBSTANTIAL PERFORMANCE OF WORK.

3) Canada shall pay the amount referred to in paragraph 2) of GC5.6 not later than

   (a) 60 days after the date of issue of a Certificate of Completion; or

   (b) 15 days after the Contractor has delivered to Canada

(i) a statutory declaration which contains a declaration by the Contractor that all of the Contractor's lawful obligations and any lawful claims against the Contractor that arose out of the performance of the Contract have been discharged and satisfied; and

(ii) evidence of compliance with workers' compensation legislation in accordance with GC1.9 WORKERS' COMPENSATION;

whichever is later.

GC5.7 (2016-05-01) PAYMENT NOT BINDING ON CANADA

1) Neither acceptance of a progress claim or progress report, nor any payment made by Canada under the Contract, nor partial or entire use or occupancy of the Work by Canada shall constitute an acceptance by Canada of any portion of the Work or Material that is not in accordance with the requirements of the Contract.

GC5.8 CLAIMS AND OBLIGATIONS

1) The Contractor shall discharge all the Contractor's lawful obligations and shall satisfy all lawful claims against the Contractor arising out of the performance of the Work at least as often as the Contract requires Canada to pay the Contractor.

2) Whenever requested to do so by Canada, the Contractor shall make a statutory declaration declaring to the existence and condition of any obligations and claims against the Contractor arising out of the performance of the Work.

3) In order to discharge lawful obligations of and satisfy lawful claims against the Contractor or its Subcontractors arising out of the performance of the Contract, Canada may pay an amount that is due and payable to the Contractor directly to the claimant. Such payment 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.

4) For the purposes of paragraph 3) of GC5.8, and subject to paragraph 6) of GC5.8, a claim or obligation shall be considered lawful when it is so determined by

(a) a court of legal jurisdiction;

(b) an arbitrator duly appointed to arbitrate the claim; or

(c) the written consent of the Contractor authorizing payment of the claim or obligation.

5) If a claim or obligation would have been subject to the provisions of Provincial or Territorial lien legislation or, in the Province of Quebec, the law relating to legal hypothecs had the Contractor been performing the Work for an entity other than Canada

(a) such amount as may be paid by Canada pursuant to paragraphs 3) and 4) of GC5.8 shall not exceed the amount that the Contractor would have been obliged to pay had the provisions of such legislation or law been applicable to the Work;

(b) a 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 privilege which the claimant might have had; and

(c) for the purposes of determining the entitlement of a claimant, the notice required by paragraph 8) of GC5.8 shall be deemed to replace the registration or provision of notice after the performance of work as required by any applicable legislation and no claim shall be deemed to have expired, become void or unenforceable by reason of the claimant not commencing any action within the time prescribed by such legislation.

6) The Contractor shall, at the request of any claimant, submit to binding arbitration those questions that need to be answered to establish the entitlement of the claimant to payment. The arbitration shall have as parties to it any Subcontractor or Supplier to whom the claimant supplied Material, performed work or rented equipment should such Subcontractor or Supplier wish to be adjoined, and Canada shall not be a party to such arbitration. Subject to any agreement between the Contractor and the claimant, the arbitration shall be conducted in accordance with the governing Provincial or Territorial legislation applicable to the site of the Work.

7) Paragraph 3) of GC5.8 shall apply only to claims and obligations

(a) the notification of which has set forth the amount claimed to be owing and the person who by contract is primarily liable and has been received by Canada in writing before final payment is made to the Contractor pursuant to GC5.6 FINAL COMPLETION, and within 120 days of the date on which the claimant

(i) should have been paid in full under the claimant's contract with the Contractor, its Subcontractor or Supplier if the claim is for money that was lawfully required to be held back from the claimant; or

(ii) performed the last of the services, work or labour, or furnished the last of the Material pursuant to the claimant's contract with the Contractor or its Subcontractor or Supplier where the claim is for money not lawfully required to be held back from the claimant; and

(b) the proceedings to determine the right to payment of which, pursuant to paragraph 5) of GC5.8, shall have commenced within one year from the date that the notification required by subparagraph 7)(a) of GC5.8 was received by Canada.

8) Upon receipt of a notice of claim, Canada may 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.

9) Canada shall notify the Contractor in writing in a timely manner of receipt of any claim and of the intention of Canada to withhold funds. At any time thereafter and until payment is made to the claimant, the Contractor may be entitled to post, with Canada, security in a form acceptable to Canada in an amount equal to the value of the claim, and upon receipt of such security Canada shall release to the Contractor any funds that would be otherwise payable to the Contractor, that were withheld pursuant to the provisions of this clause in respect of the claim of any claimant for whom the security stands.

GC5.9 RIGHT OF SETOFF

1) Without limiting any right of setoff or deduction given or implied by law or elsewhere in the Contract, Canada may set off any amount payable to Canada by the Contractor under the Contract, or under any current contract, against any amount payable to the Contractor under the Contract.

2) For the purposes of paragraph 1) of GC5.9, "current contract" means a contract between Canada and the Contractor

   (a) under which the Contractor has an undischarged obligation to perform or supply work, labour or material; or

   (b) in respect of which Canada has, since the date of the Contract, exercised any right to take the work that is the subject of that contract out of the Contractor's hands.

GC5.10 ASSESSMENTS AND DAMAGES FOR LATE COMPLETION

1) For the purposes of this clause

   (a) the Work shall be deemed to be completed on the date of the Certificate of Completion; and

   (b) the "period of delay" means the number of days commencing on the day fixed for completion of the Work and ending on the day immediately preceding the day on which the Work is completed but does not include any day within a period of extension granted pursuant to GC6.5 DELAYS AND EXTENSION OF TIME and any other day on which, in the opinion of Canada, completion of the Work was delayed for reasons beyond the control of the Contractor.

2) If the Contractor does not complete the Work by the day fixed for its completion but completes it thereafter, the Contractor shall pay Canada an amount equal to the aggregate of

   (a) all salaries, wages and travelling expenses incurred by Canada in respect of persons overseeing the performance of the Work during the period of delay;

   (b) the cost incurred by Canada as a result of the inability to use the completed Work for the period of delay; and

   (c) all other expenses and damages incurred or sustained by Canada during the period of delay as a result of the Work not being completed by the day fixed for its completion.

3) Canada may waive the right of Canada to the whole or any part of the amount payable by the Contractor pursuant to paragraph 2) of GC5.10 if, in the opinion of Canada, it is in the public interest to do so.

GC5.11 DELAY IN MAKING PAYMENT

1) Notwithstanding GC1.5 TIME OF THE ESSENCE, any delay by Canada in making any payment when it is due pursuant to GC5 TERMS OF PAYMENT, shall not be a breach of the Contract by Canada.

2) Subject to paragraph 3) of GC5.11, Canada shall pay to the Contractor simple interest at the Average Bank Rate plus 3 percent per annum on any amount that is overdue pursuant to paragraph 3) of GC5.1 INTERPRETATION, and the interest shall apply from and include the day such amount became overdue until the day prior to the date of payment.

3) Interest shall be paid without demand by the Contractor except that

(a) in respect of amounts that are less than 15 days overdue, no interest shall be paid in respect of payment made within such 15 days unless the Contractor so demands after such amounts have become due and payable; and

(b) interest shall not be payable or paid on overdue advance payments, if any.

GC5.12 INTEREST ON SETTLED CLAIMS

1) For the purposes of this clause, a claim means a disputed amount subject to negotiation between Canada and the Contractor under the Contract.

2) A claim is deemed to have been settled when an agreement in writing is signed by Canada and the Contractor setting out the amount of the claim to be paid by Canada and the items of work for which the said amount is to be paid.

3) A settled claim is deemed to be outstanding from the day immediately following the date the said claim would have been due and payable under the Contract had it not been disputed.

4) Canada shall pay to the Contractor simple interest on the amount of a settled claim at the Average Bank Rate plus 3 percent per annum from the date the settled claim was deemed to be outstanding until the day prior to the date of payment.

GC5.13 RETURN OF SECURITY DEPOSIT

1) After a Certificate of Substantial Performance has been issued, and if the Contractor is not in breach of nor in default under the Contract, Canada shall return to the Contractor all or any part of a Security Deposit that, in the opinion of Canada, is not required for the purposes of the Contract.

2) After a Certificate of Completion has been issued, Canada shall return to the Contractor the remainder of any security deposit unless the Contract stipulates otherwise.

3) If the security deposit was paid into the Consolidated Revenue Fund of Canada, Canada shall pay interest thereon to the Contractor at a rate established pursuant to section 21(2) of the *Financial Administration Act (FAA)*.

GC6 DELAYS AND CHANGES IN THE WORK

GC6.1 CHANGES IN THE WORK

1) At any time before issuance of a Certificate of Completion, Canada may issue orders for additions, deletions or other changes to the Work, or changes in the location or position of the whole or any part of the Work, if the addition, deletion, change or other revision is deemed by Canada to be consistent with the general intent of the Contract.

2) An order referred to in paragraph 1) of GC6.1 shall be in writing and given to the Contractor in accordance with GC2.3 NOTICES.

3) Upon receipt of an order, the Contractor shall promptly perform the work in accordance with the order as if the order had appeared in and been part of the original Contract.

4) If anything done or omitted by the Contractor pursuant to an order increases or decreases the cost of the Work to the Contractor, payment for the work shall be made in accordance with GC6.4 DETERMINATION OF PRICE.

GC6.2 CHANGES IN SUBSURFACE CONDITIONS

1) If, during the performance of the Work, the Contractor encounters subsurface conditions that are substantially different from the subsurface conditions described in the tender documents supplied to the Contractor, or a reasonable assumption of fact based thereon, the Contractor shall give notice to Canada immediately upon becoming aware of the situation.

2) If the Contractor is of the opinion that the Contractor may incur or sustain any extra expense or any loss or damage that is directly attributable to the changed subsurface conditions, the Contractor shall within 10 days of the date the changed subsurface conditions were encountered, give Canada written notice of intention to claim for that extra expense, loss or damage.

3) If the Contractor has given a notice referred to in paragraph 2) of GC6.2, the Contractor shall give Canada a written claim for extra expense, loss or damage no later than 30 days after the date that a Certificate of Substantial Performance is issued.

4) A written claim referred to in paragraph 3) of GC6.2 shall contain a sufficient description of the facts and circumstances of the occurrence that is the subject of the claim to enable Canada to determine whether or not the claim is justified, and the Contractor shall supply such further and other information for that purpose as Canada requires.

5) If Canada determines that a claim referred to in paragraph 3) of GC6.2 is justified, Canada shall make an extra payment to the Contractor in an amount that is calculated in accordance with GC6.4 DETERMINATION OF PRICE.

6) If, in the opinion of Canada, the Contractor effects a saving of expenditure that is directly attributable to a substantial difference between the information relating to subsurface conditions at the site of the Work that is contained in the tender documents, or a reasonable assumption of fact based thereon, and the actual subsurface conditions encountered by the Contractor, the Contract Amount shall be reduced by the amount of the saving of expenditure determined in accordance with GC6.4 DETERMINATION OF PRICE.

7) If the Contractor fails to give a notice referred to in paragraph 2) of GC6.2 and a claim referred to in paragraph 3) of GC6.2 within the times stipulated, an extra payment shall not be made to the Contractor in respect of the occurrence.

8) Canada does not warrant the content expressed in any subsurface report available for the perusal of the Contractor that does not form part of the tender and contract documents.

GC6.3 HUMAN REMAINS, ARCHAEOLOGICAL REMAINS AND ITEMS OF HISTORICAL OR SCIENTIFIC INTEREST

1) For the purposes of this clause

   (a) "human remains" means the whole or any part of a deceased human being, irrespective of the time of death;

   (b) "archaeological remains" are items, artefacts or things made, modified or used by human beings in antiquity and may include, but not be limited to, stone, wood or iron structures or monuments, dump deposits, bone artefacts, weapons, tools, coins, and pottery; and

   (c) "items of historical or scientific interest" are naturally occurring or manufactured objects or things of any age that are not archaeological remains but may be of interest to society because of their historical or scientific significance, value, rarity, natural beauty, or other quality.

2) If, during the course of the Work, the Contractor encounters any object, item or thing which is described in paragraph 1) of GC6.3 or which resembles any object, item or thing described in paragraph 1) of GC6.3, the Contractor shall

   (a) take all reasonable steps, including stopping work in the affected area, to protect and preserve the object, item or thing;

   (b) immediately notify Canada of the circumstances in writing; and

   (c) take all reasonable steps to minimize additional costs that may accrue as a result of any work stoppage.

3) Upon receipt of a notification in accordance with subparagraph 2)(b) of GC6.3, Canada shall promptly determine whether the object, item or thing is one described in, or contemplated by paragraph 1) of GC6.3, and shall notify the Contractor in writing of any action to be performed, or work to be carried out, by the Contractor as a result of Canada's determination.

4) Canada may, at any time, enlist the services of experts to assist in the investigation, examination, taking of measurements or other such recordings, placing of permanent protection around or removing of the object, item or thing encountered by the Contractor, and the Contractor shall, to the satisfaction of Canada, allow them access and co-operate with them in the carrying out of their duties and obligations.

5) Human remains, archaeological remains and items of historical or scientific interest encountered at the site of the Work shall be deemed to be the property of Canada.

6) Except as may be otherwise provided for in the Contract, the provisions of GC6.4 DETERMINATION OF PRICE and GC6.5 DELAYS AND EXTENSION OF TIME shall apply.

GC6.4 DETERMINATION OF PRICE

GC6.4.1 Price Determination Prior to Undertaking Changes

1) If 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 plus a negotiated allowance for supervision, co-ordination, administration, overhead, margin and the risk of undertaking the work within the stipulated amount.

2) If 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 quantities and prices per unit to the Unit Price Table.

3) A price per unit referred to in paragraph 2) of GC6.4.1 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, plus a negotiated allowance.

4) To facilitate approval of the price of the change or the additional price per unit as applicable, 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 negotiated allowance.

5) If no agreement is reached as contemplated in paragraph 1) of GC6.4.1, the price shall be determined in accordance with GC6.4.2.

6) If no agreement is reached, as contemplated in paragraphs 2) and 3) of GC6.4.1, Canada 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 GC6.4.2.

GC6.4.2 Price Determination Following Completion of Changes

1) If it is not possible to predetermine, or if 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

   (a) 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 paragraph 2) of GC6.4.2, that are directly attributable to the performance of the Contract;

   (b) an allowance for profit and all other expenditures or costs, including overhead, general administration costs, financing and interest charges, in an amount that is equal to 10 percent of the sum of the expenses referred to in subparagraph 1)(a) of GC6.4.2; and

   (c) interest on the amounts determined under subparagraphs 1)(a) and 1)(b) of GC6.4.2 calculated in accordance with GC5.12 INTEREST ON SETTLED CLAIMS;

2) The cost of labour, Plant and Material referred to in subparagraph 1)(a) of GC6.4.2 shall be limited to the following categories of expenditure:
   (a) payments to Subcontractors and Suppliers;

   (b) wages, salaries, bonuses and, if applicable, travel and lodging expenses of employees of the Contractor located at the site of the Work and that portion of wages, salaries, bonuses and, if applicable, travel and lodging 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;

   (c) 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 Applicable Taxes collection costs;

   (d) 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 has been approved by Canada;

   (e) 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 Canada, 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;

   (f) 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;

   (g) 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

   (h) any other payments made by the Contractor with the approval Canada that are necessary for the performance of the Contract in accordance with the Contract Documents.

GC6.4.3 Price Determination - Variations in Tendered Quantities

1) Except as provided in paragraphs 2), 3), 4) and 5) of GC6.4.3, if it appears that the final quantity of labour, Plant and Material under a price per unit item shall exceed or be less than the estimated tendered quantity, the Contractor shall perform the Work or supply the Plant and Material required to complete the item and payment shall be made for the actual Work performed or Plant and Material supplied at the price per unit set out in the Contract.

2) If the final quantity of the price per unit item exceeds the estimated tendered quantity by more than 15 percent, either party to the Contract may make a written request to the other party to negotiate an amended price per unit for that portion of the item which exceeds 115 percent of the estimated tendered quantity, and to facilitate approval of any amended price per unit, the Contractor shall, on request, provide Canada with

   (a) detailed records of the actual cost to the Contractor of performing or supplying the tendered quantity for the price per unit item up to the time the negotiation was requested; and

(b) the estimated unit cost of labour, Plant and Material required for the portion of the item that is in excess of 115 percent of the tendered quantity.

3) If agreement is not reached as contemplated in paragraph 2) of GC6.4.3, the price per unit shall be determined in accordance with GC6.4.2.

4) If it appears that the final quantity of labour, Plant and Material under a price per unit item shall be less than 85 percent of the estimated tendered quantity, either party to the Contract may make a written request to the other party to negotiate a change to the price per unit for the item if

(a) there is a demonstrable difference between the unit cost to the Contractor of performing or supplying the estimated tendered quantity and the unit cost to the Contractor for performing or supplying the final quantity; and

(b) the difference in unit cost is due solely to the decrease in quantity and not to any other cause.

5) For the purposes of the negotiation referred to in paragraph 4) of GC6.4.3

(a) the onus of establishing, justifying and quantifying a proposed change lies with the party making the request for negotiation; and

(b) in no event shall the total price for an item that has been amended as a result of a reduction in quantity pursuant to paragraph 4) of GC6.4.3 exceed the amount that would have been payable to the Contractor had 85 percent of the tendered quantity actually been performed or supplied.

GC6.5 DELAYS AND EXTENSION OF TIME

1) Upon application of the Contractor made before the date first fixed for completion of the Work or before any other date previously fixed under this clause, Canada may extend the time for completion of the Work by fixing a new date if Canada determines that causes beyond the control of the Contractor have delayed its completion.

2) The Contractor's application shall be accompanied by the written consent of the bonding company whose bond forms part of the Contract Security.

3) Subject to paragraph 4) of GC6.5, no payment, other than a payment that is expressly stipulated in the Contract, shall be made by Canada to the Contractor for any extra expense, loss or damage incurred or sustained by the Contractor due to delay, whether or not the delay is caused by circumstances beyond the control of the Contractor.

4) If the Contractor incurs or sustains any extra expense or any loss or damage that is directly attributable to any neglect or delay that occurs after the date of the Contract on the part of Canada in providing any information or in doing any act that the Contract either expressly requires Canada to do or that would ordinarily be done by an owner in accordance with the practice of the trade, the Contractor shall give Canada written notice of intention to claim for that extra expense or loss or damage within ten working days of the date the neglect or delay first occurred.

5) When the Contractor has given a notice referred to in paragraph 4) of GC6.5, the Contractor shall give Canada a written claim for the extra expense, loss or damage no later than 30 days after the date that a Certificate of Completion is issued and not afterwards.

6) A written claim referred to in paragraph 5) of GC6.5 shall contain a sufficient description of the facts and circumstances of the occurrence that is the subject of the claim to enable Canada to determine whether or not the claim is justified and the Contractor shall supply such further and other information for that purpose as Canada may require.

7) If Canada determines that a claim referred to in paragraph 5) of GC6.5 is justified, Canada shall make an extra payment to the Contractor in an amount that is calculated in accordance with GC6.4 DETERMINATION OF PRICE.

8) If the Contractor fails to give a notice referred to in paragraph 4) and a claim referred to in paragraph 5) of GC6.5 within the times stipulated, an extra payment shall not be made to the Contractor in respect of the occurrence.

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 in accordance with GC2.3 NOTICES, Canada, without any other authorization, 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 diligent performance of the Work to the satisfaction of Canada within six days of Canada giving notice to the Contractor in writing in accordance with GC2.3 NOTICES;

   (b) defaults in the completion of any part of the Work within the time fixed for its completion by the Contract;

   (c) becomes insolvent, or has committed 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 of the Contract without the consent required by GC1.16 ASSIGNMENT; 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, subject only to paragraph 3) of GC7.1, extinguished, and the Contractor is liable to pay Canada, upon demand, an amount that is equal to the amount of all loss and damage incurred or sustained by Canada in respect of the Contractor's failure to complete the Work.

3) If the whole or any part of the Work that is taken out of the Contractor's hands is completed by Canada, Canada may pay the Contractor the amount, if any, of the holdback or a progress claim as determined by Canada that had accrued and was due prior to the date on which the Work was taken out of the Contractor's hands and 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.

4) The taking of the Work or any part thereof out of the Contractor's hands does not relieve the Contractor from any obligation under the Contract or imposed by law except the obligation to complete the performance of that part of the Work that was taken out of the Contractor's hands.

5) If the Work or any part thereof is taken out of the Contractor's hands, all Plant and Material and the interest of the Contractor, or its suppliers or subcontractors at any tier, in all real property, licences, powers and privileges acquired, used or provided by the Contractor, or its suppliers or subcontractors at any tier, under the Contract shall continue to be the property of Canada without compensation.

6) When Canada certifies that any Plant, Material, or any interest of the Contractor is no longer required for the purposes 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.

7) If the Contractor has become insolvent or has committed an act of bankruptcy, and has either made a proposal to its creditors or filed a notice of intention to make such a proposal, pursuant to the *Bankruptcy and Insolvency Act*, the Contractor shall immediately forward a copy of the proposal or the notice of intention to Canada.

GC7.2 SUSPENSION OF WORK

1) When, in Canada's opinion, it is in the public interest to do so, Canada may require the Contractor to suspend performance of the Work either for a specified or an unspecified period, by giving a notice of suspension in writing to the Contractor in accordance with GC2.3 NOTICES.

2) When a notice of suspension is received by the Contractor, the Contractor shall suspend all operations in respect of the Work except those that Canada determines are necessary for the care and preservation of the Work, Plant and Material.

3) During a period of suspension, the Contractor shall not remove any part of the Work, Plant or Material from its site without the consent of Canada.

4) If a period of suspension is 60 days or less, the Contractor shall resume the performance of the Work on the expiration of that period, and the Contractor is entitled to be paid the extra costs necessarily incurred by the Contractor as a result of the suspension, determined in accordance with GC6.4 DETERMINATION OF PRICE.

5) If a period of suspension is more than 60 days, Canada and the Contractor may agree that the performance of the Work shall be continued by the Contractor, and the Contractor shall resume performance of the Work subject to any terms and conditions agreed upon by Canada and the Contractor. If Canada and the Contractor do not agree that performance of the Work shall be continued by the Contractor, or upon the terms and conditions under which the Contractor shall continue the Work, the notice of suspension shall be deemed to be a notice of termination pursuant to GC7.3 TERMINATION OF CONTRACT.

GC7.3 TERMINATION OF CONTRACT

1) Canada may terminate the Contract at any time by giving a notice of termination in writing to the Contractor in accordance with GC2.3 NOTICES.

2) If the Contractor receives a notice of termination, the Contractor shall forthwith cease all operations in performance of the Contract, subject to any conditions stipulated in the notice.

3) Subject to paragraph 4) of GC7.3, if the Contract is terminated, Canada shall pay the Contractor an amount determined to be due to the Contractor pursuant to GC6.4 DETERMINATION OF PRICE less the aggregate of all amounts that were paid to the Contractor by Canada and all amounts that are due to Canada from the Contractor pursuant to the Contract.

4) In no event shall the total amount payable by Canada to the Contractor exceed the amount, calculated in accordance with GC5 TERMS OF PAYMENT, that would have been payable to the Contractor had the Contractor completed the Work.

5) Payment to the Contractor, if any, shall be made as soon as practicable under the circumstances.

GC7.4 SECURITY DEPOSIT - FORFEITURE OR RETURN

1) If the Work is taken out of the Contractor's hands, or the Contractor is in breach of, or in default under, the Contract, Canada may convert a security deposit to Canada's own use.

2) If Canada converts a security deposit, the amount realized shall be deemed to be an amount due from Canada to the Contractor under the Contract.

3) Any balance of the amount realized that remains after payment of all losses, damage and claims of Canada and others shall be paid by Canada to the Contractor if, in the opinion of Canada, it is not required for the purposes of the Contract.

GC8 DISPUTE RESOLUTION

GC8.1 INTERPRETATION

1) "dispute" means any disagreement regarding any issue identified by the Contractor in the notice submitted to Canada in accordance with paragraph 2 of GC8.3 NOTICE OF DISPUTE, and includes any claim by the Contractor arising from such disagreement and any counterclaim by Canada, but does not include any claim by either party for punitive or exemplary damages, injury to persons, death, or any claim based on an allegation of libel or slander.

2) The alternative dispute resolution procedures set out in GC8, do not apply to any claim by Canada against the Contractor except any counterclaim in a dispute as defined in paragraph 1 of GC8.1, including, but not limited to, any claim of setoff regarding any amount due to Canada under GC5.10 ASSESSMENT AND DAMAGES FOR LATE COMPLETION.

GC8.2 CONSULTATION AND CO-OPERATION

1) The parties agree to maintain open and honest communication throughout the performance of the Contract.

2) The parties agree to consult and co-operate with each other in the furtherance of the Work and the resolution of problems or differences that may arise.

GC8.3 NOTICE OF DISPUTE

1) Any difference between the parties to the Contract of any nature arising out of or in connection with the Contract which could result in a claim by the Contractor against Canada, and which is not settled by consultation and co-operation as envisaged in GC8.2

CONSULTATION AND CO-OPERATION, shall be resolved in the first instance by Canada, whose written decision or direction shall be final and binding subject only to the provisions of GC8. Such written decision or direction includes, but is not limited to, any written decision or direction by Canada under any provision of the General Conditions.

2) The Contractor shall be deemed to have accepted the decision or direction of Canada referred to in paragraph 1) of GC8.3 and to have expressly waived and released Canada from any claim in respect of the particular matter dealt with in that decision or direction unless, within 15 working days after receipt of the decision or direction, the Contractor submits to Canada a written notice of dispute requesting formal negotiation under GC8.4 NEGOTIATION. Such notice shall refer specifically to GC8.4 NEGOTIATION, and shall specify the issues in contention and the relevant provisions of the Contract.

3) The giving of a written notice in accordance with paragraph 2) of GC8.3 shall not relieve the Contractor from complying with the decision or direction that is the subject of the dispute. Such compliance, however, shall not be construed as an admission by the Contractor of the correctness of such decision or direction.

4) If a dispute is not resolved promptly, Canada shall give such instructions as, in Canada's opinion, are necessary for the proper performance of the Work and to prevent delays pending a resolution of the matter. Unless Canada terminates the Contract, orders the Contractor to suspend the Work, or takes the Work out of the hands of the Contractor, the Contractor shall continue to perform the Work in accordance with the provisions and requirements of the Contract and the instructions of Canada. Such performance shall not prejudice any claim that the Contractor may have.

5) Nothing in GC8 relieves the Contractor from its obligation to provide any other notice required by the Contract within the time specified in the Contract, including but not limited to, any notice required under GC6.2 CHANGES IN SUBSURFACE CONDITIONS.

GC8.4 NEGOTIATION

1) Within 10 working days after receipt by Canada of a notice referred to in paragraph 2) of GC8.3 NOTICE OF DISPUTE, or within such other period of time as may be mutually agreed to, the parties shall commence formal negotiations in order to resolve the dispute. Negotiations shall occur initially between representatives of the Contractor and Canada who play a direct supervisory role in the performance, administration or management of the Contract.

2) If the representatives referred to in paragraph 1) of GC8.4 are unable to resolve some or all of the issues which are the subject of the negotiations within 10 working days, the parties shall refer the remaining issues which are in dispute to a second level of negotiation between a principal or principals of the Contractor and a senior level manager or senior level managers representing Canada.

3) If negotiations fail to resolve the dispute within 30 working days from the date of delivery of the notice referred to in paragraph 2) of GC8.3 NOTICE OF DISPUTE, or within such longer period as may have been agreed to by the parties, the Contractor may, by giving written notice to Canada, in accordance with GC2.3 NOTICES, within 10 working days from the end of such period, request that mediation be undertaken to assist the parties to reach agreement on the outstanding issues.

3) If the Contractor does not request mediation within the period permitted by paragraph 3) of GC8.4, the Contractor shall be deemed to have accepted the decision or direction of Canada under paragraph 1) of GC8.3 NOTICE OF DIPUTE and to have expressly waived and

released Canada from any claim in respect of the particular matter dealt with in that decision or direction.

GC8.5 MEDIATION

1) If the Contractor has requested mediation in accordance with paragraph 3) of GC8.4 NEGOTIATION, mediation shall be conducted in accordance with GC8.8 RULES FOR MEDIATION OF DISPUTES.

2) If a Project Mediator has not previously been appointed for the purposes of the Contract, a Project Mediator shall be appointed in accordance with GC8.8 RULES FOR MEDIATION OF DISPUTES forthwith after delivery of a notice in accordance with paragraph 3) of GC8.4 NEGOTIATION, requesting mediation.

3) If the dispute has not been resolved within

   (a) Ten (10) working days following the appointment of a Project Mediator in accordance with paragraph 2) of GC8.5, if a Project Mediator was not previously appointed;

   (b) Ten (10) working days following receipt by Canada of a written notice in accordance with paragraph 3) of GC8.4 NEGOTIATION, if a Project Mediator was previously appointed; or

   (c) such other longer period as may have been agreed to by the parties;

   the Project Mediator shall terminate the mediation by giving written notice to the parties stating the effective date of termination.

GC8.6 BINDING ARBITRATION

1) If mediation of the dispute is terminated pursuant to the provisions of GC8.5, "Mediation", and

   a) the termination of mediation occurs prior to the applicable date set out in paragraph 4) of GC8.6; and

   b) the disputed issues involve issues of fact or issues of arbitral questions of law or issues of mixed fact and arbitral questions of law;

   either party, by giving notice in writing to the other party in accordance with GC2.3, "Notices", may require that the dispute be resolved by binding arbitration pursuant to GC8.6.

2) A notice referred to in paragraph 1) of GC8.6 shall be given within 10 working days of the date of termination of mediation under GC8.5 Mediation and shall be in accordance with GC2.3, "Notices".

3) If no notice is given within the period set out in paragraph 2) of GC8.6, or if the conditions set out in subparagraphs 1)(a) and 1)(b) of GC8.6 are not met, the arbitration provisions set out in GC8.6 do not apply to the dispute.

4) Unless otherwise agreed, the arbitration of the dispute shall be held in abeyance until the earlier of

   a) the date of issuance of a Certificate of Substantial Performance under GC5.5, "Substantial Performance of the Work";

b) the date the Work is taken out of the Contractor's hands; and

c) the date of termination of the Contract;

and consolidated with all other such disputes into a single arbitration.

5) Arbitral proceedings under this GC8.6 shall be governed by and conducted in accordance with the **Commercial Arbitration Act**, R.S. 1985, c. 17 (2nd Supp.) and the provisions of GC8.11, "Rules for Arbitration of Disputes".

6) For the purposes of calculating time under the Rules for Arbitration referred to in paragraph 5) of GC8.6, arbitration proceedings shall commence on the applicable date set out in paragraph 4) of GC8.6.

7) Notwithstanding anything else contained in GC8.6, the arbitration provisions in GC8.6 do not apply if the aggregate amount of all claims by the Contractor required to be arbitrated on the applicable date set out in paragraph 4) of GC8.6 is less than $25,000.

GC8.7 DISPUTES NOT SUBJECT TO ARBITRATION

1) Where the arbitration provisions in GC8.6, "Binding Arbitration", do not apply to a dispute as a result of paragraphs 3) or 7) of GC8.6, "Binding Arbitration", either party may take such court action or proceedings as it considers appropriate, including, without limiting the foregoing, all suits that would otherwise have been immediately available to it but for the provisions of these Dispute Resolution Conditions. Subject to the provisions of paragraph 2) of GC8.7, the Contractor shall initiate any such action or proceeding no later than three calendar months after the date that a Certificate of Completion is issued under GC5.6, "Final Completion", and not afterwards, except where it is otherwise provided by law.

2) Any action or proceeding resulting from a direction under GC3.13, "Warranty and Rectification of Defects in Work", shall be initiated by the Contractor no later than three calendar months after the expiry of the warranty or guarantee period and not afterwards, except where it is otherwise provided by law.

GC8.8 (2016-05-01) CONFIDENTIALITY

All information exchanged during alternative dispute resolution procedures, by whatever means, shall be without prejudice and shall be treated as confidential by the parties and their representatives, unless otherwise required by law. However, evidence that is independently admissible or discoverable shall not be rendered inadmissible or non-discoverable by virtue of its use during an alternative dispute resolution process.

GC8.9 (2016-05-01) SETTLEMENT

Any agreement to settle all or any part of a dispute, by whatever means, shall be in writing and be signed by the parties or their authorized representatives.

GC8.10 (2016-05-01) RULES FOR MEDIATION OF DISPUTES

GC8.10.1 Interpretation

In these Rules

1) "Coordinator" means the person designated by Canada to act as the Dispute Resolution Coordinator.

GC8.10.2 Application

1) By mutual agreement, the parties may change or make additions to the Rules.

GC8.10.3 Communication

1) Written communications pursuant to these Rules shall be given in accordance with GC2.3 NOTICES.

GC8.10.4 Appointment of Project Mediator

1) The parties to the Contract may, by mutual consent, at any time after entry into the Contract, appoint a mediator (the "Project Mediator") to conduct mediation proceedings in accordance with these Rules for Mediation of Disputes, in regard to any dispute that may arise with regard to the interpretation, application or administration of the Contract. In this case, they shall jointly enter into a contract with the appointed Project Mediator, which contract shall be in a form drafted by the Coordinator and agreed to by the parties.

2) If the parties do not appoint a Project Mediator pursuant to paragraph 1) of GC8.8.4, the parties shall appoint a Project Mediator within 17 working days following receipt of a written notice from the Contractor, in accordance with GC2.3 NOTICES, requesting that mediated negotiations be undertaken in accordance with these Rules to assist the parties to reach agreement on any outstanding issues that may be in dispute. Any contract entered into with the appointed Project Mediator shall meet the requirements as set out for the contract described in paragraph 1) of GC8.8.4.

3) When mediation is requested by the Contractor pursuant to paragraph 3) of GC8.4 NEGOTIATION, if the parties have previously entered into a contract with a Project Mediator, the parties shall within 2 days send to both the Project Mediator and the Coordinator

   (a) a copy of the notice requesting negotiation under paragraph 2) of GC8.3 NOTICE OF DISPUTE;

   (b) a copy of Canada's written position in relation to the notice, the issues in contention and the relevant provisions of the contract; and

   (c) a copy of the Contractor's written request for mediation required under paragraph 3) of GC8.4 NEGOTIATION.

4) If the parties have not agreed on a Project Mediator, the parties shall forthwith provide the Coordinator with the written materials referred to in subparagraphs 3)(a), 3)(b) and 3)(c) of GC8.8.4 together with a request that the Coordinator assist in the appointment of a mutually acceptable Project Mediator in accordance with these Rules.

5) Within 5 working days following receipt of the request and materials referred to in paragraph 4) of GC8.8.4, the Coordinator shall provide the parties with a list of qualified private sector mediators obtained from an independent and impartial entity, together with instructions to

each party to individually and confidentially select and rank their preferred and fully acceptable choices of mediator in descending order. Each mediator listed shall be impartial and independent of the parties, and shall be an experienced and skilled commercial mediator, preferably with knowledge of the subject matter of the dispute.

6) Within 10 working days of receipt of the list referred to in paragraph 5) of GC8.8.4 each party shall comply with the instructions accompanying the list(s) and shall deliver the completed listing to the Coordinator.

7) Within 2 working days following receipt of the completed listings, the Coordinator shall select the highest common ranked mediator to act as Project Mediator for the purposes of the contract.

8) In the event of a tie, the Coordinator shall consult both parties to re-evaluate their rankings in order to assist the Coordinator in selecting a Project Mediator acceptable to both parties. If the parties cannot agree upon a Project Mediator, the Coordinator shall forthwith provide the parties with a second list of mediators and the procedure shall be repeated.

9) If the parties have not previously entered into a contract with a mutually acceptable Project Mediator, the Coordinator shall use reasonable efforts to negotiate a contract with a mutually acceptable Project Mediator on behalf of the parties, which contract shall incorporate or otherwise comply with the provisions of these Rules. If negotiations are unsuccessful, or if for other reason the individual is unwilling or unable to enter into a contract to act as Project Mediator, the Coordinator shall repeat the process with the second-highest common ranked mediator.

10) The parties agree that, upon successful completion of the negotiations referred to in paragraph 9) of GC8.8.4, they shall jointly enter into a contract with the selected Project Mediator, which contract shall be in a form drafted by the Coordinator and agreed to by the parties.

11) Upon execution of the contract with the Project Mediator referred to in paragraph 10) of GC8.8.4 the Coordinator shall provide the Project Mediator with copies of the documents referred to in paragraph 3) of GC8.8.4.

GC8.10.5 Confidentiality

1) Subject to paragraph 2) of GC8.8.5, and unless otherwise agreed in writing by the parties, the Project Mediator, the parties and their counsel or representatives shall keep confidential all matters and documents disclosed during mediation proceedings except where the disclosure is necessary for any implementation of any agreement reached or is required by law.

2) Evidence that is independently admissible or discoverable in any arbitral or judicial proceeding shall not be rendered inadmissible or non-discoverable by virtue of its use in mediation proceedings.

3) Neither party shall make transcripts, minutes or other records of a mediation conference.

4) The personal notes and written opinions of the Project Mediator made in relation to mediation are in the Project Mediator's sole possession and control, are confidential, and may not be used in any subsequent proceeding between the parties or where they are opposed in interest without the express written permission of the parties.

5) All information exchanged during mediation procedures, by whatever means, shall be without prejudice and shall be treated as confidential by the parties and their representatives, unless otherwise required by law.

GC8.10.6 Time and Place of Mediation

1) The Project Mediator, in consultation with the parties shall set the date, time and place of any mediation conference as soon as possible, bearing in mind that, subject to agreement to the contrary between the parties, only 10 working days are available within which to attempt to settle the dispute.

GC8.10.7 Representation

1) Representatives of the parties may be accompanied at the mediation conference by legal counsel or any other person.

2) If the Project Mediator is a lawyer, the Project Mediator shall not provide legal advice to a party during the course of the mediation conference, but may recommend that a party obtain independent legal advice before finalizing a settlement agreement.

GC8.10.8 Procedure

1) The parties agree to an exchange of all facts, information and documents upon which they intend to rely in any oral or written presentation during the mediation. This exchange shall be completed no later than 2 working days prior to the date set for a mediation conference.

2) The Project Mediator shall be free to meet with the parties individually during a mediation conference if the Project Mediator is of the opinion that this may improve the chances of a mediated settlement, and either party may request such an individual meeting at any time.

3) The parties may agree to extend the 10 working days available for settlement of the dispute through mediation, and the Project Mediator shall record that agreement in writing.

GC8.10.9 Settlement Agreement

1) The parties shall record in writing any settlement agreement reached, with sufficient detail to ensure a clear understanding of

   (a) the issues resolved;

   (b) any obligations assumed by each party including criteria to determine if and when these obligations have been met; and

   (c) the consequences of failure to comply with the agreement reached.

2) The parties agree to carry out the terms of a settlement agreement as soon as possible and, in any event, within any time periods specified in the agreement.

GC8.10.10 Termination of Mediation

1) Either party may withdraw from mediation at any time without reason and, in that event, the Project Mediator shall give each party a written notice terminating the mediation and establishing the effective date of termination.

2) If, in the opinion of the Project Mediator, either party fails to mediate in good faith or fails to comply with the terms of these Rules, or if the Project Mediator, at any time during mediation, is of the opinion that further negotiations will fail to resolve the issues outstanding, the Project Mediator may terminate the negotiations by providing the parties with a written notice of termination, stating therein the Project Mediator's reasons for the termination, and the effective date of termination.
3) If a dispute has not been resolved within 10 working days or such other longer period as may have been agreed to by the parties, the Project Mediator shall terminate the mediation by giving written notice to the parties stating the effective date of termination.

GC8.10.11 Costs

1) The parties agree that they will each be responsible for the costs of their own representatives and advisors and associated travel and living expenses. Fees and expenses of the Project Mediator and all administrative costs of mediation, such as the cost of the meeting room(s), if any, shall be borne equally by the parties.

GC8.10.12 Subsequent Proceedings

1) The parties shall not rely on or introduce as evidence in any arbitral or judicial proceeding, whether or not such proceeding relates to the subject matter of mediation,

   (a) any documents of other parties that are not otherwise producible in those proceedings;

   (b) any views expressed or suggestions made by any party in respect of a possible settlement of issues;

   (c) any admission made by any party in the course of mediation unless otherwise stipulated by the admitting party; and

   (d) the fact that any party has indicated a willingness to make or accept a proposal or recommendation for settlement.

2) The Project Mediator shall neither represent nor testify on behalf of either of the parties in any subsequent investigation, action or proceeding relating to the issues in mediation proceedings.

3) The Project Mediator shall not be subpoenaed to give evidence relating to

   (a) the Project Mediator's role in mediation; or

   (b) the matters or issues in mediation;

   in any subsequent investigation, action or proceeding and the parties agree to vigorously oppose any effort to have the Mediator so subpoenaed.

GC9 CONTRACT SECURITY

GC9.1 OBLIGATION TO PROVIDE CONTRACT SECURITY

1) The Contractor shall, at the Contractor's expense and within 14 days after the date that the Contractor receives notice that the Contractor's bid was accepted by Canada, obtain and deliver Contract Security to Canada in one of the forms prescribed in GC9.2 TYPES AND AMOUNTS OF CONTRACT SECURITY.

2) If the whole or a part of the Contract Security provided is in the form of a security deposit, it shall be held and disposed of in accordance with GC5.13 RETURN OF SECURITY DEPOSIT and GC7.4 SECURITY DEPOSIT - FORFEITURE OR RETURN.

3) If a part of the Contract Security provided is in the form of a labour and material payment bond, the Contractor shall post a copy of that bond at the site of the Work.

4) It is a condition precedent to the release of the first progress payment that the Contractor has provided the Contract Security as specified herein.

GC9.2 (2016-05-01) TYPES AND AMOUNTS OF CONTRACT SECURITY

1) The Contractor shall deliver to Canada either (a) or (b).

   a) A performance bond and a labour and material payment bond each in an amount that is equal to not less than 50 percent of the Contract Amount (excluding applicable tax(es)).

   b) A security deposit or an irrevocable standby letter of credit in an amount that is equal to not less than 20 percent of the Contract Amount (excluding applicable tax(es)).

2) A performance bond and a labour and material payment bond referred to in paragraph 1) of GC9.2 shall be in a form and be issued by a bonding or surety company that is approved by Canada.

   (a) The approved form for the performance bond is displayed at the following Website: http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494&section=text#appS

   (b) The approved form for the labour and material payment bond is displayed at the following website: http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494&section=text#appS ; and

   (c) The list of approved bonding or surety companies is displayed at the following Website: http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494&section=text#appL

3) A security deposit referred to in subparagraph 1)(b) of GC9.2 shall be in the form of

   a. a bill of exchange, bank draft or money order made payable to the Receiver General for Canada and certified by an approved financial institution or drawn by an approved financial institution on itself; or

b. bonds of, or unconditionally guaranteed as to principal and interest by, the Government of Canada.

4) For the purposes of subparagraph 3)(a) of GC9.2

a) a bill of exchange is an unconditional order in writing signed by the Contractor and addressed to an approved financial institution, requiring the said institution to pay, on demand, at a fixed or determinable future time a sum certain of money to, or to the order of, the Receiver General for Canada;

b) if a bill of exchange, bank draft or money order is certified by or drawn on an institution or corporation other than a chartered bank, it must be accompanied by proof that the said institution or corporation meets at least one of the criteria described in subparagraph 4)(c) of GC9.2, either by letter or by a stamped certification on the bill of exchange, bank draft or money; and

c) An approved financial institution is

I. a corporation or institution that is a member of the Canadian Payments Association as defined in the Canadian Payments Act;

II. a corporation that accepts deposits that are insured, to the maximum permitted by law, by the Canada Deposit Insurance Corporation or the "Autorité des marchés financiers";

III. a corporation that accepts deposits from the public if repayment of the deposit is guaranteed by Her Majesty the Queen in right of a province;

IV. a corporation, association or federation incorporated or organized as a credit union or co-operative credit society that conforms to the requirements of a credit union which are more particularly described in paragraph 137(6) of the Income Tax Act; or

V. Canada Post Corporation.

5) Bonds referred to in subparagraph 3)(b) of GC9.2 shall be provided on the basis of their market value current at the date of the Contract, and shall be

a) made payable to bearer; or

b) accompanied by a duly executed instrument of transfer of the bonds to the Receiver General for Canada in the form prescribed by the Domestic Bonds of Canada Regulations; or

c) registered as to principal, or as to principal and interest, in the name of the Receiver General for Canada pursuant to the Domestic Bonds of Canada Regulations.

6) An irrevocable standby letter of credit referred to in subparagraph 1)(b) of GC9.2 shall

a) be an arrangement, however named or described, whereby a financial institution (the "Issuer") acting at the request and on the instructions of a customer (the "Applicant") or on its own behalf,

I. is to make a payment to, or to the order of, Canada as the beneficiary;

II. is to accept and pay bills of exchange drawn by Canada;

III. authorizes another financial institution to effect such payment or accept and pay such bills of exchange; or

IV. authorizes another financial institution to negotiate against written demand(s) for payment provided that the terms and conditions of the letter of credit are complied with;

b) state the face amount that may be drawn against it;

c) state its expiry date;

d) provide for sight payment to the Receiver General for Canada by way of the financial institution's draft against presentation of a written demand for payment signed by Canada;

e) provide that more than one written demand for payment may be presented subject to the sum of those demands not exceeding the face value of the letter of credit;

f) provide that it is subject to the International Chamber of Commerce (ICC) Uniform Customs and Practice (UCP) for Documentary Credits, 2007 Revision, ICC Publication No. 600. Pursuant to the ICC UCP, a credit is irrevocable even if there is no indication to that effect; and

g) be issued or confirmed, in either official language in a format left to the discretion of the issuer or confirmer, by an approved financial institution on its letterhead.

GC10 INSURANCE

GC10.1 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 paragraph 1) of GC10.1 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 GC10.2 INSURANCE PROCEEDS.

GC10.2 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 GC10.1 INSURANCE CONTRACTS, 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 GC10.1 INSURANCE CONTRACTS, the proceeds of the claim shall be paid by the insurer directly to the claimant.

3) If an election is made pursuant to paragraph 1) of GC10.2, 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 subparagraph 1)(b) of GC10.2; 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 paragraph 3) of GC10.2 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 paragraph 4) of GC10.2, 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 paragraph 3) of GC10.2, be deemed to have been expended and discharged.

6) If an election is not made pursuant to subparagraph 1)(b) of GC10.2, the contractor shall, subject to paragraph 7) of GC10.2, 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 paragraph 6) of GC10.2, Canada shall pay the contractor out of the monies referred to in paragraph 1) of GC10.2 so far as they will thereunto extend.

8) Subject to paragraph 7) of GC10.2, payment by Canada pursuant to paragraph 7) of GC10.2 shall be made in accordance with the contract but the amount of each payment shall be 100 percent of the amount claimed notwithstanding subparagraphs 3)(a) and 3)(b) of GC5.4 PROGRESS PAYMENT.

Appendix "E"

TECHNICAL SPECIFICATIONS & PLANS

9160, boul. Leduc, Bureau 210 – Quartier Dix30, Brossard, Québec J4Y 0E3

AGRICULTURE AND AGRI-FOOD CANADA

Replacement of CR-2 and CR-3 water towers
Research and Development Center

Project no : 532971

TECHNICAL SPECIFICATIONS

Issued for Bid

Prepared by:

Nicolas Bélanger, P. Eng. | Mechanical and General conditions

Réal Ouimet, P. Eng. | Electrical

August 19, 2019

WSP Project: 191-08126-00

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PART 1 GENERAL

1.1 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Accompany submissions with transmittal letter, in [duplicate], containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.4 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

1.2 INSPECTION

.1 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.3 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.4 MILL TESTS

.1 Submit mill test certificates.

1.5 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical and electrical systems.

1.6 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Remove from site all such work after use.

1.7 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

1.8 HOISTING

.1 Provide, operate and maintain hoists or cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.

.2 Hoists or cranes to be operated by qualified operator.

1.9 ELEVATORS

.1 Designated existing elevators to be used by construction personnel and transporting of materials. Co-ordinate use with DCC Representative.

.2 Provide protective coverings for finish surfaces of cars and entrances.

1.10 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.11 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

1.12 SECURITY

.1 Provide and pay for responsible security

1.13 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.14 SANITARY FACILITIES

.1 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.15 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by DCC Representative.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

1.16 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

1.17 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant and the DCC Representative of findings.

.2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points.

1.18 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Consultant and DCC Representative of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment.

1.19 PREPARATION

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

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.20 EXECUTION

.1 Fit several parts together, to integrate with other Work.

.2 Remove and replace defective and non-conforming Work.

.3 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.4 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.5 Restore work with new products in accordance with requirements of Contract Documents.

.6 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.7 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

1.21 DELIVERY, STORAGE AND HANDLING

.1 Storage Requirements: Implement a recycling/reuse program that includes separate collection of waste materials as appropriate to the project waste and the available recycling and reuse programs in the project area.

.2 Handling Requirements: Clean materials that are contaminated before placing in collection containers and ensure that waste destined for landfill does not get mixed in with recycled materials:

.1 Deliver materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.

.2 Arrange for collection by or delivery to the appropriate recycling or reuse facility.

.3 Hazardous Waste and Hazardous Materials: Handle in accordance with applicable regulations.

1.22 INFORMATIONAL SUBMITTALS AND TRAINING

.1 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Consultant's and DCC Representative's approval.

.2 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

.3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.23 QUALITY ASSURANCE

.1 When specified in individual Sections requiring manufacturer to provide authorized representative to demonstrate operation of equipment and systems:

.1 Instruct Owner's personnel.

.2 Provide written report that demonstration and instructions have been completed.

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 General conditions of the contract apply.

1.2 REFERENCE STANDARDS

.1 American Society of Mechanical Engineers International (ASME)

- .1 ANSI/ASME B16.15, Cast Cooper Alloy Threaded Fittings, Classes 125 and 250.
- .2 ANSI/ASME B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.
- .3 ANSI/ASME B16.22, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- .4 ANSI/ASME B16.24, Cast Copper Alloy Pipe Flanges and Flanged Fittings: Class 150, 300, 400, 600, 900, 1500 and 2500.
- .5 ASME B16.26, Cast Copper Alloy Fittings for Flared Copper Tubes.
- .6 ASME B31.9, Building Services Piping.
- .7 ASME B36.19M, Stainless Steel Pipe.

.2 ASTM International (ASTM)

- .1 ASTM A182/A 182M, Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
- .2 ASTM A269, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- .3 ASTM A307 , Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .4 ASTM A312/A312M, Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
- .5 ASTM A351/A351M, Castings, Austenitic, for Pressure Containing Parts.
- .6 ASTM A403/A403M, Wrought Austenitic Stainless Steel Piping Fittings.
- .7 ASTM A536, Standard Specification for Ductile Iron Castings.
- .8 ASTM B32, Standard Specification for Solder Metal.
- .9 ASTM B42, Seamless Copper Tube, Standard Sizes.
- .10 ASTM B88M, Standard Specification for Seamless Copper Water Tube (Metric).
- .11 ASTM F876, Standard Specification for Crosslinked Polyethylene (PEX) Tubing.
- .12 ASTM F877, Standard Specification for Crosslinked Polyethylene (PEX) Hot and Cold Water Distribution System.

.3 American National Standards Institute/American Water Works Association (ANSI)/(AWWA)

- .1 ANSI/AWWA C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
- .2 ANSI/AWWA C151/A21.51, Ductile Iron Pipe, Centrifugally Cast, for Water.

.4 CSA Group (CSA)

- .1 CSA B137.5, Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications.
- .2 CSA B242, Groove and Shoulder Type Mechanical Pipe Couplings.

.5 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC S101, Fire Endurance Tests of Buildings Construction and Materials.

.2 CAN/ULC S102.2, Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

.3 CAN/ULC S115, Standard Method of Fire Tests of Firestop.

.6 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS).

.1 MSS-SP-80, Bronze Gate, Globe, Angle and Check Valves.

.7 National Research Council (NRC)

.1 National Plumbing Code of Canada (NPC).

PART 2 Products

2.1 PIPING

.1 Domestic hot, cold and recirculation systems, within building.

.1 Above ground:

.1 Copper tube, hard drawn, type L: to ASTM B88M.

2.2 FITTINGS

.1 Bronze pipe flanges and flanged fittings, Class 150: to ANSI/ASME B16.24.

.2 Cast bronze threaded fittings, Class 125: to ANSI/ASME B16.15.

.3 Cast copper, solder type: to ANSI/ASME B16.18.

.4 Wrought copper and copper alloy, solder type: to ANSI/ASME B16.22.

.5 NPS 2 and larger:

.1 ANSI/ASME B16.18 or ANSI/ASME B16.22 roll grooved to CSA B242.

.6 NPS 1 ½ and smaller:

.1 Cast copper to ANSI/ASME B16.18; with 301 stainless steel internal components and EPDM seals. Suitable for operating pressure to 1380 kPa.

2.3 JOINTS

.1 Rubber gaskets, 1.6 mm thick: to AWWA C111.

.2 Bolts, nuts, hex head and washers: to ASTM A307, heavy series.

.3 Solder: 95/5.

.4 Teflon tape: for threaded joints.

.5 Grooved couplings: designed with angle bolt pads to provide rigid joint, complete with EPDM gasket.

.6 Dielectric connections between dissimilar metals: dielectric fitting, complete with thermoplastic liner.

2.4 BALL VALVES

.1 NPS 2 and under, screwed:

.1 Class 150.

.2 Bronze body, stainless steel ball, PTFE adjustable packing, brass gland and PTFE seat, steel lever handle.

.2 NPS 2 and under, soldered:

.1 To ANSI/ASME B16.18, Class 150.

.2 Bronze body, stainless steel ball, PTFE adjustable packing, brass gland and PTFE seat, steel lever handle, with NPT to copper adaptors.

PART 3 EXECUTION

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install in accordance with NPC.

.2 Assemble piping using fittings manufactured to ANSI and Standard Council of Canada (SCC) standards.

.3 Valves

.1 Isolate equipment, fixtures and branches with ball valves.

3.3 PRESSURE TESTS

.1 Test pressure: greater of 1 times maximum system operating pressure or 860 kPa.

3.4 START-UP

.1 Start-up procedures:

.1 Establish circulation and ensure that air is eliminated.

.2 Check pressurization to ensure proper operation and to prevent water hammer, flashing and/or cavitation.

.3 Check control, limit, safety devices for normal and safe operation.

.2 Rectify start-up deficiencies.

3.5 OPERATION REQUIREMENTS

.1 Co-ordinate operation and maintenance requirements including, cleaning and maintenance of specified materials and products with Section 23 05 15- Common Installation Requirements for HVAC Pipework.

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 General conditions of the contract apply.

1.2 REFERENCE STANDARDS

.1 ASTM International (ASTM)

.1 ASTM D2564, Standard Specification for Solvent Cements for Poly (Vinyl-Chloride) (PVC) Plastic Piping Systems.

.2 CSA Group (CSA)

.1 CAN/CSA-Series B1800, Thermoplastic Nonpressure Pipe Compendium - B1800 Series.

.3 Green Seal Environmental Standards (GSES)

.1 Standard GS-36, Commercial Adhesives.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (SDS).

.5 National Research Council Canada (NRC)

.1 National Plumbing Code of Canada 2015 (NPC).

.6 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168, Adhesive and Sealant Applications.

PART 2 PRODUCTS

2.1 PIPING AND FITTINGS

.1 For above ground DWV piping to:

.1 CAN/CSA B1800.

2.2 JOINTS

.1 Solvent weld for PVC: to ASTM D2564.

PART 3 EXECUTION

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 In accordance with Section 23 05 15- Common installation requirements for HVAC pipework.

3.3 TESTING

.1 Hydraulically test to verify grades and freedom from obstructions.

3.4 PERFORMANCE VERIFICATION

.1 Cleanouts:

.1 Ensure accessible and that access doors are correctly located.

.2 Open, cover with linseed oil and re-seal.

.3 Verify cleanout rods can probe as far as the next cleanout, at least.

.2 Test to ensure traps are fully and permanently primed.

.3 Affix applicable label (storm, sanitary, vent, pump discharge) c/w directional arrows every floor or 4.5 m (whichever is less).

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 General conditions of the contract apply.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for the water towers and their accessories

.2 Shop Drawings:

.1 Indicate on drawings:

.1 Mounting arrangements.

.2 Operating and maintenance clearances.

.2 Shop drawings and product data accompanied by:

.1 Detailed drawings of bases, supports, and anchor bolts.

.2 Acoustical sound power data, where applicable.

.3 Points of operation on performance curves.

.4 Manufacturer to certify current model production.

.5 Certification of compliance to applicable codes.

1.3 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: submit operation and maintenance data

.1 Operation and maintenance manual approved by, and final copies deposited with Consultant before final inspection.

.2 Operation data to include:

.1 Control schematics for systems including environmental controls.

.2 Description of systems and their controls.

.3 Description of operation of systems at various loads together with reset schedules and seasonal variances.

.4 Operation instruction for systems and component.

.5 Description of actions to be taken in event of equipment failure.

.6 Valves schedule and flow diagram.

.7 Colour coding chart.

.3 Maintenance data to include:

.1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.

.2 Data to include schedules of tasks, frequency, tools required and task time.

.4 Performance data to include:

.1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.

.2 Equipment performance verification test results.

.3 Special performance data as specified.

.4 Testing, adjusting and balancing reports as specified in Section 23 05 93- Testing, Adjusting and Balancing for HVAC.

.5 Approvals:

.1 Submit [2] copies of draft Operation and Maintenance Manual to Consultant for approval.

.2 Make changes as required and re-submit as directed Consultant

.6 Additional data:

.1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.

.7 Site records:

.1 Consultant will provide reproducible mechanical drawings.

.2 Transfer information to reproducibles, revising reproducibles to show work as actually installed.

.3 Use different colour waterproof ink for each service.

.4 Make available for reference purposes and inspection.

.8 As-built drawings:

.1 Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.

.2 Identify each drawing in lower right-hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).

.3 Submit to Consultant for approval and make corrections as directed.

.4 Perform testing, adjusting and balancing for HVAC using as-built drawings.

.5 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

.9 Submit copies of as-built drawings for inclusion in final TAB report.

1.4 MAINTENANCE MATERIAL SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Furnish spare parts as follows:

.1 One set of packing for each pump.

.3 Provide one set of special tools required to service equipment as recommended by manufacturers.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Storage and Handling Requirements:

.1 Store materials off ground]and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 MATERIAL

.1 N/A

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable before installation.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PAINTING REPAIRS AND RESTORATION

.1 Prime and touch up marred finished paintwork to match original.

.2 Restore to new condition, finishes which have been damaged.

3.3 SYSTEM CLEANING

.1 Clean interior and exterior of all systems including strainers. Vacuum interior of ductwork and air handling units.

3.4 FIELD QUALITY CONTROL

.1 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 - ACTION AND INFORMATIONAL 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.

3.5 DEMONSTRATION

.1 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.

.2 Use operation and maintenance manual, as-built drawings, and audio-visual aids as part of instruction materials.

.3 Instruction duration time requirements are 8 hours in two (2) visits.

3.6 CLEANING

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.7 PROTECTION

.1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 Electrical motors, drives and guards for mechanical equipment and systems.

.2 Supplier and installer responsibility indicated in Motor, Control and Equipment Schedule on electrical drawings and related mechanical responsibility is indicated on Mechanical Equipment Schedule on mechanical drawings.

.3 Control wiring and conduit is specified in Division 26 except for conduit, wiring and connections below 50 V which are related to control systems specified in Division 22 and 23. Refer to Division 26 for quality of materials and workmanship.

.2 Related Requirements

.1 Section 23 05 00 applies to the present section.

1.2 REFERENCE STANDARDS

.1 American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE)

.1 ASHRAE 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings (IESNA cosponsored; ANSI approved; Continuous Maintenance Standard).

.2 Electrical Equipment Manufacturers' Association Council (EEMAC)

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (SDS).

1.3 QUALITY ASSURANCE

.1 Regulatory Requirements: work to be performed in compliance with TDGA.

.2 Health and Safety Requirements: do construction occupational health and safety

PART 2 PRODUCTS

2.1 GENERAL

.1 Motors: high efficiency, in accordance with local Hydro company standards and to ASHRAE 90.1.

2.2 MOTORS

.1 Provide motors for mechanical equipment as specified.

.2 Motors under 1/2 HP: speed as indicated, continuous duty, built-in overload protection, resilient mount, single phase, 120 V, unless otherwise specified or indicated.

.3 Motors 1/2 HP and larger: EEMAC Class B, squirrel cage induction, speed as indicated, continuous duty, drip proof, ball bearing, maximum temperature rise 40 degrees C, 3 phase.

2.3 BELT DRIVES

.1 Fit reinforced belts in sheave matched to drive. Multiple belts to be matched sets.

.2 Use cast iron or steel sheaves secured to shafts with removable keys unless otherwise indicated.

.3 For motors under 10 HP: standard adjustable pitch drive sheaves, having plus or minus 10% range. Use mid-position of range for specified r/min.

.4 For motors 10 HP and over: sheave with split tapered bushing and keyway having fixed pitch unless specifically required for item concerned. Provide sheave of correct size to suit balancing.

.5 Correct size of sheave determined during commissioning.

.6 Minimum drive rating: 1.5 times nameplate rating on motor. Keep overhung loads within manufacturer's design requirements on prime mover shafts.

.7 Motor slide rail adjustment plates to allow for centre line adjustment.

2.4 DRIVE GUARDS

.1 Provide guards for unprotected drives.

.2 Guards for belt drives;

.1 Expanded metal screen welded to steel frame.

.2 Minimum 1.2 mm thick sheet metal tops and bottoms.

.3 38 mm dia holes on both shaft centres for insertion of tachometer.

.4 Removable for servicing.

.3 Provide means to permit lubrication and use of test instruments with guards in place.

.4 Install belt guards to allow movement of motors for adjusting belt tension.

.5 Guard for flexible coupling:

.1 "U" shaped, minimum 1.6 mm thick galvanized mild steel.

.2 Securely fasten in place.

.3 Removable for servicing.

.6 Unprotected fan inlets or outlets:

.1 Wire or expanded metal screen, galvanized, 19 mm mesh.

.2 Net free area of guard: not less than 80% of fan openings.

.3 Securely fasten in place.

.4 Removable for servicing.

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 datasheet.

3.2 INSTALLATION

.1 Fasten securely in place.

.2 Make removable for servicing, easily returned into, and positively in position.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 23 05 00 applies to the present section.

1.2 REFERENCE STANDARDS

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.

.2 Green Seal Environmental Standards (GSES)

.1 Standard GS-11, Environmental Standard for Paints and Coatings.

.3 National Research Council Canada (NRC)

.1 National Fire Code of Canada (NFC).

.4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1113, Architectural Coatings.

.2 SCAQMD Rule 1168, Adhesive and Sealant Applications.

PART 2 PRODUCTS

2.1 MATÉRIAL

.1 Paint: zinc-rich to CAN/CGSB-1.181.

2.2 BUTTERFLY VALVES – RESILIENT SEAT – 200 PSIG

.1 Except to specialty valves, to be of single manufacturer.

.2 To be suitable for dead-end service.

.3 CRN registration number required for products.

.4 Sizes:

.1 Lug type: NPS 2 to 30.

.2 Grooved end type: NPS 2 to 12.

.5 Pressure rating for tight shut-off at temperatures up to maximum for seat material.

.1 NPS 2 - 12: 200 psig.

.6 Minimum seat temperature ratings to 121 degrees C.

.7 Application: on-off operation.

.8 Full lug body (threaded).

.9 Designed to comply with MSS SP-67 and API 609.

.10 Compatible with ANSI Class 125/Class 150 flanges.

.11 Construction:

.1 Body: stainless steel

.2 Disc: 316 SS.

.3 Seat: EPDM.

.4 Shaft: 316 stainless steel

.5 Taper pin: 316 SS.

.6 Key: stainless.

.7 O-Ring: EPDM.

.8 Bushings: Teflon.

PART 3 EXECUTION

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 CONNECTIONS TO EQUIPMENT

.1 In accordance with manufacturer's instructions unless otherwise indicated.

.2 Use valves and either unions or flanges for isolation and ease of maintenance and assembly.

.3 Use double swing joints when equipment mounted on vibration isolation and when piping subject to movement.

3.3 CLEARANCES

.1 Provide clearance around systems, equipment and components for observation of operation, inspection, servicing, maintenance and as recommended by manufacturer

.2 Provide space for disassembly, removal of equipment and components as recommended by manufacturer without interrupting operation of other system, equipment, components.

3.4 DRAINS

.1 Install piping with grade in direction of flow except as indicated.

.2 Install drain valve at low points in piping systems, at equipment and at section isolating valves.

.3 Pipe each drain valve discharge separately to above floor drain.

.1 Discharge to be visible.

.4 Drain valves: NPS 3/4 gate or globe valves unless indicated otherwise, with hose end male thread, cap and chain.

3.5 AIR VENTS

.1 Install air vents to at high points in piping systems.

.2 Install isolating valve at each automatic air valve.

.3 Install drain piping to approved location and terminate where discharge is visible.

3.6 DIELECTRIC COUPLINGS

.1 General: compatible with system, to suit pressure rating of system.

.2 Locations: where dissimilar metals are joined.

.3 NPS 2 and under: isolating unions or bronze valves.

.4 Over NPS 2: isolating flanges.

3.7 PIPEWORK INSTALLATION

.1 Install pipework to CAN/CSA B139.

.2 Screwed fittings jointed with Teflon tape.

.3 Protect openings against entry of foreign material.

.4 Install to isolate equipment and allow removal without interrupting operation of other equipment or systems.

.5 Assemble piping using fittings manufactured to ANSI standards.

.6 Saddle type branch fittings may be used on mains if branch line is no larger than half size of main.

.1 Hole saw (or drill) and ream main to maintain full inside diameter of branch line prior to welding saddle.

.7 Install exposed piping, equipment, rectangular cleanouts and similar items parallel or perpendicular to building lines.

.8 Install concealed pipework to minimize furring space, maximize headroom, conserve space.

.9 Slope piping, except where indicated, in direction of flow for positive drainage and venting.

.10 Install, except where indicated, to permit separate thermal insulation of each pipe.

.11 Ream pipes, remove scale and other foreign material before assembly.

.12 Use eccentric reducers at pipe size changes to ensure positive drainage and venting.

.13 Provide for thermal expansion as indicated.

.14 Valves:

.1 Install in accessible locations.

.2 Remove interior parts before soldering.

.3 Install with stems above horizontal position unless indicated.

.4 Valves accessible for maintenance without removing adjacent piping.

.5 Install globe valves in bypass around control valves.

.6 Use butterfly or ball valves at branch take-offs for isolating purposes except where specified.

.7 Install butterfly valves on chilled water systems only.

.8 Install butterfly valves between weld neck flanges to ensure full compression of liner.

.15 Check Valves:

.1 Install silent check valves in vertical pipes with downward flow and as indicated.

.2 Install swing check valves in horizontal lines and as indicated.

3.8 FLUSHING OUT OF PIPING SYSTEMS

.1 Before start-up, clean interior of piping systems in accordance with requirements of relevant mechanical sections.

.2 Preparatory to acceptance, clean and refurbish equipment and leave in operating condition, including replacement of filters in piping systems.

3.9 PRESSURE TESTING OF EQUIPMENT AND PIPEWORK

.1 Advise Consultant 48 hours minimum prior to performance of pressure tests.

.2 Pipework: test as specified in relevant sections of heating, ventilating and air conditioning work.

.3 Maintain specified test pressure without loss for 4 hours minimum unless specified for longer period in relevant mechanical sections.

.4 Prior to tests, isolate equipment and other parts which are not designed to withstand test pressure or media.

.5 Insulate or conceal work only after approval and certification of tests by Consultant.

3.10 EXISTING SYSTEMS

.1 Connect into existing piping systems at times approved [DCC Representative.

.2 Request written approval by DCC Representative 5 days minimum, prior to commencement of work.

.3 Be responsible for damage to existing plant by this work.

3.11 VALVE INSTALLATION

.1 Install valves according to manufacturer's instructions.

.2 Don’t insert gaskets between flanges and valves unless instructed otherwise by the valve manufacturer.

.3 Check the valve identification label to ensure that each is suitable for the type of fluid being conveyed.

.4 Mount the actuators on the valves before installing them.

.5 Handle valves carefully to avoid damaging throttle and bearing faces.

.6 On horizontal piping, mount valves with rod horizontally to minimize wear of sleeve and packing.

.7 Ensure valves are centered between fixing bolts before tightening bolts, then open and close valves to check if butterfly moves freely. If there is an obstacle to the shutter movement, for example due to the excessive wall thickness of the pipe, correct the problem by chamfering the ends of the piping adjacent to the valve.

3.12 CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 23 05 00 applies to the present section.

1.2 REFERENCE STANDARDS

.1 American Society of Mechanical Engineers (ASME)

.1 ASME B31.1, Power Piping.

.2 ASTM International (ASTM)

.1 ASTM A125, Standard Specification for Steel Springs, Helical, Heat-Treated.

.2 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.3 ASTM A563, Standard Specification for Carbon and Alloy Steel Nuts.

.3 Factory Mutual (FM)

.4 Manufacturer's Standardization Society of the Valves and Fittings Industry (MSS)

.1 MSS SP58, Pipe Hangers and Supports - Materials, Design and Manufacture.

.2 MSS SP69, Pipe Hangers and Supports - Selection and Application.

.3 MSS SP89, Pipe Hangers and Supports - Fabrication and Installation Practices.

.5 National Research Council Canada (NRC)

.1 National Plumbing Code of Canada (NPC).

.6 Underwriter's Laboratories of Canada (ULC)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

.1 Design Requirements:

.1 Construct pipe hanger and support to manufacturer's recommendations utilizing manufacturer's regular production components, parts and assemblies.

.2 Base maximum load ratings on allowable stresses prescribed by ASME B31.1 or MSS SP58.

.3 Ensure that supports, guides, anchors do not transmit excessive quantities of heat to building structure.

.4 Design hangers and supports to support systems under conditions of operation, allow free expansion and contraction, prevent excessive stresses from being introduced into pipework or connected equipment.

.5 Provide for vertical adjustments after erection and during commissioning. Amount of adjustment in accordance with MSS SP58.

.2 Performance Requirements:

.1 Design supports, platforms, catwalks, hangers to withstand seismic loads due to moderate risk location – St-Jean sur-Richelieu.

2.2 GENERAL

.1 Fabricate hangers, supports and sway braces in accordance with MSS SP58. ANSI B31.1 and

.2 Use components for intended design purpose only. Do not use for rigging or erection purposes.

2.3 PIPE HANGERS

.1 Finishes:

.1 Pipe hangers and supports: galvanized or painted with zinc-rich paint after manufacture.

.2 The elements must be galvanized.

.3 Ensure steel hangers in contact with copper piping are epoxy coated or copper plated.

.2 Upper attachment structural: suspension from lower flange of I-Beam:

.1 Cold piping NPS 2 maximum: malleable iron C-clamp with hardened steel cup point setscrew, locknut carbon steel retaining clip.

.1 Rod: 9 mm UL listed.

.2 Cold piping NPS 2 1/2 or greater, hot piping: malleable iron beam clamp, eye rod, jaws and extension with carbon steel retaining clip, tie rod, nuts and washers, UL.

.3 Upper attachment structural: suspension from upper flange of I-Beam:

.1 Cold piping NPS 2 maximum: ductile iron top-of-beam C-clamp with hardened steel cup point setscrew, locknut and carbon steel retaining clip, UL listed.

.2 Cold piping NPS 2 1/2 or greater, hot piping: malleable iron top-of-beam jaw-clamp with hooked rod, spring washer, plain washer and nut UL listed.

.3 Upper attachment to concrete.

.4 Ceiling: carbon steel welded eye rod, clevis plate, clevis pin and cotters with weldless forged steel eye nut. Ensure eye 6 mm minimum greater than rod diameter.

.5 Concrete inserts: wedge shaped body with UL listed knockout protector plate.

.6 Shop and field-fabricated assemblies.

.7 Sway braces for seismic restraint systems: for moderate risk location St-Jean sur-Richelieu.

.4 Hanger rods: threaded rod material to MSS SP58:

.1 Ensure that hanger rods are subject to tensile loading only.

.2 Provide linkages where lateral or axial movement of pipework is anticipated.

.3 Do not use 22 mm or 28 mm rod.

.5 Pipe attachments: material to MSS SP58:

.1 Attachments for steel piping: carbon steel galvanized.

.2 Attachments for copper piping: copper plated black steel.

.3 Use insulation shields for hot pipework.

.4 Oversize pipe hangers and supports.

.6 Adjustable clevis: material to MSS SP69 UL listed, clevis bolt with nipple spacer and vertical adjustment nuts above and below clevis.

.7 Yoke style pipe roll: carbon steel yoke, rod and nuts with cast iron roll, to MSS SP69.

.8 U-bolts: carbon steel to MSS SP69 with 2 nuts at each end to ASTM A563.

.1 Finishes for steel pipework: galvanized.

.9 Pipe rollers: cast iron roll and roll stand with carbon steel rod to MSS SP69.

2.4 RISER CLAMPS

.1 Steel or cast iron pipe: galvanized carbon steel to MSS SP58, type 42,[UL listed.

.2 Copper pipe: carbon steel copper plated to MSS SP58, type 42.

.3 Bolts: to ASTM A307.

.4 Nuts: to ASTM A563.

2.5 INSULATION PROTECTION SHIELDS

.1 Insulated cold piping:

.1 64 kg/m^{3}density insulation plus insulation protection shield to: MSS SP69, galvanized sheet carbon steel. Length designed for maximum 3 m span.

.2 Insulated hot piping:

.1 Curved plate 300 mm long, with edges turned up, welded-in centre plate for pipe sizes NPS 12 and over, carbon steel to comply with MSS SP69.

2.6 CONSTANT SUPPORT SPRING HANGERS

.1 Springs: alloy steel to ASTM A125, shot peened, magnetic particle inspected, with ±5% spring rate tolerance, tested for free height, spring rate, loaded height and provided with Certified Mill Test Report (CMTR).

.2 Load adjustability: 10 % minimum adjustability each side of calibrated load. Adjustment without special tools. Adjustments not to affect travel capabilities.

.3 Provide upper and lower factory set travel stops.

.4 Provide load adjustment scale for field adjustments.

.5 Total travel to be actual travel + 20%. Difference between total travel and actual travel 25 mm minimum.

.6 Individually calibrated scales on each side of support calibrated prior to shipment, complete with calibration record.

2.7 VARIABLE SUPPORT SPRING HANGERS

.1 Vertical movement: 13 mm minimum, 50 mm maximum, use single spring pre-compressed variable spring hangers.

.2 Vertical movement greater than 50 mm: use double spring pre-compressed variable spring hanger with 2 springs in series in single casing.

.3 Variable spring hanger complete with factory calibrated travel stops.

.4 Steel alloy springs: to ASTM A125, shot peened, magnetic particle inspected, with ±5 % spring rate tolerance, tested for free height, spring rate, loaded height and provided with CMTR.

2.8 EQUIPMENT SUPPORTS

.1 Fabricate equipment supports not provided by equipment manufacturer from structural grade steel meeting requirements of Section 05 12 23- Structural Steel for Buildings. Submit calculations with shop drawings.

2.9 EQUIPMENT ANCHOR BOLTS AND TEMPLATES

.1 Provide templates to ensure accurate location of anchor bolts.

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 datasheet.

3.2 INSTALLATION

.1 Install in accordance with:

.1 Manufacturer's instructions and recommendations.

.2 Vibration Control Devices:

.1 Install on piping systems at pumps, boilers, chillers, cooling towers, and as indicated.

.3 Clamps on riser piping:

.1 Support independent of connected horizontal pipework using riser clamps and riser clamp lugs welded to riser.

.2 Bolt-tightening torques to industry standards.

.3 Steel pipes: install below coupling or shear lugs welded to pipe.

.4 Cast iron pipes: install below joint.

.4 Clevis plates:

.1 Attach to concrete with 4 minimum concrete inserts, one at each corner.

.5 Provide supplementary structural steelwork where structural bearings do not exist or where concrete inserts are not in correct locations.

.6 Use approved constant support type hangers where:

.1 Vertical movement of pipework is 13 mm or more,

.2 Transfer of load to adjacent hangers or connected equipment is not permitted.

.7 Use variable support spring hangers where:

.1 Transfer of load to adjacent piping or to connected equipment is not critical.

.2 Variation in supporting effect does not exceed 25 % of total load.

3.3 HANGER SPACING

.1 Plumbing piping: to National Plumbing Code of Canada (NPC) specified by authority having jurisdiction.

.2 Fire protection: to applicable fire code.

.3 Gas and fuel oil piping: up to NPS 1/2: every 1.8 m.

.4 Copper piping: up to NPS 1/2: every 1.5 m.

.5 Flexible joint roll groove pipe: in accordance with table below for steel, but not less than one hanger at joints. Table listings for straight runs without concentrated loads and where full linear movement is not required.

.6 Within 300 mm of each elbow.

Maximum Pipe Size : NPS	Maximum Spacing Steel	Maximum Spacing Copper
up to 1-1/4	2.4 m	1.8 m
1-1/2	3.0 m	2.4 m
2	3.0 m	2.4 m
2-1/2	3.7 m	3.0 m
3	3.7 m	3.0 m
3-1/2	3.7 m	3.3 m
4	3.7 m	3.6 m
5	4.3 m	
6	4.3 m	
8	4.3 m	
10	4.9 m	
12	4.9 m	

.7 Pipework greater than NPS 12: to MSS SP69.

3.4 HANGER INSTALLATION

.1 Install hanger so that rod is vertical under operating conditions.

.2 Adjust hangers to equalize load.

.3 Support from structural members. Where structural bearing does not exist or inserts are not in suitable locations, provide supplementary structural steel members.

3.5 HORIZONTAL MOVEMENT

.1 Angularity of rod hanger resulting from horizontal movement of pipework from cold to hot position not to exceed 4 degrees from vertical.

.2 Where horizontal pipe movement is less than 13 mm, offset pipe hanger and support so that rod hanger is vertical in the hot position.

3.6 FINAL ADJUSTMENT

.1 Adjust hangers and supports:

.1 Ensure that rod is vertical under operating conditions.

.2 Equalize loads.

.2 Adjustable clevis:

.1 Tighten hanger load nut securely to ensure proper hanger performance.

.2 Tighten upper nut after adjustment.

.3 C-clamps:

.1 Follow manufacturer's recommended written instructions and torque values when tightening C-clamps to bottom flange of beam.

.4 Beam clamps:

.1 Hammer jaw firmly against underside of beam.

3.7 CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 Vibration isolation materials and components, seismic control measures and their installation.

.2 Related Requirements

.1 Section 23 05 00 applies to the present section.

1.2 REFERENCE STANDARDS

.1 National Building Code of Canada (NBC).

PART 2 PRODUCTS

2.1 GENERAL

.1 Size and shape of bases type and performance of vibration isolation as indicated.

2.2 ELASTOMERIC PADS

.1 Type EP1 - neoprene waffle or ribbed; 9 mm minimum thick; 50 durometer; maximum loading 350 kPa.

.2 Type EP2 - rubber waffle or ribbed; 9 mm minimum thick; 30 durometer natural rubber; maximum loading 415 kPa.

.3 Type EP3 - neoprene-steel-neoprene; 9 mm minimum thick neoprene bonded to 1.71 mm steel plate; 50 durometer neoprene, waffle or ribbed; holes sleeved with isolation washers; maximum loading 350 kPa.

.4 Type EP4 - rubber-steel-rubber; 9 mm minimum thick rubber bonded to 1.71 mm steel plate; 30 durometer natural rubber, waffle or ribbed; holes sleeved with isolation washers; maximum loading 415 kPa.

2.3 ELASTOMERIC MOUNTS

.1 Type M1 - colour coded; neoprene in shear; maximum durometer of 60; threaded insert and two bolt-down holes; ribbed top and bottom surfaces.

2.4 SPRINGS

.1 Design stable springs: ratio of lateral to axial stiffness is equal to or greater than 1.2 times ratio of static deflection to working height. Select for 50% travel beyond rated load. Units complete with levelling devices.

.2 Ratio of height when loaded to diameter of spring between 0.8 to 1.0.

.3 Colour code springs.

2.5 SPRING MOUNT

.1 Zinc or cadmium plated hardware; housings coated with rust resistant paint.

.2 Type M2 - stable open spring: support on bonded 6 mm minimum thick ribbed neoprene or rubber friction and acoustic pad.

.3 Type M3 - stable open spring: 6 mm minimum thick ribbed neoprene or rubber friction and acoustic pad, bonded under isolator and on isolator top plate; levelling bolt for rigidly mounting to equipment.

.4 Type M4 - restrained stable open spring: supported on bonded 6 mm minimum thick ribbed neoprene or rubber friction and acoustic pad; built-in resilient limit stops, removable spacer plates.

.5 Type M5 - enclosed spring mounts with snubbers for isolation up to 950 kg maximum.

.6 Performance: as indicated by manufacturer.

2.6 HANGERS

.1 Colour coded springs, rust resistant, painted box type hangers. Arrange to permit hanger box or rod to move through a 30 degrees arc without metal to metal contact.

.2 Type H1 - neoprene - in-shear, moulded with rod isolation bushing which passes through hanger box.

.3 Type H2 - stable spring, elastomeric washer, cup with moulded isolation bushing which passes through hanger box.

.4 Type H3 - stable spring, elastomeric element, cup with moulded isolation bushing which passes through hanger box.

.5 Type H4 - stable spring, elastomeric element with precompression washer and nut.

.6 Performance: as indicated.

2.7 ACOUSTIC BARRIERS FOR ANCHORS AND GUIDES

.1 Acoustic barriers: between pipe and support, consisting of 25 mm minimum thick heavy-duty duck and neoprene isolation material.

2.8 HORIZONTAL THRUST RESTRAINT

.1 Spring and elastomeric element housed in box frame; assembly complete with rods and angle brackets for equipment and ductwork attachment; provision for adjustment to limit maximum start and stop movement to 9 mm.

.2 Arrange restraints symmetrically on either side of unit and attach at centerline of thrust.

2.9 STRUCTURAL BASES

.1 Type B1 - Prefabricated steel base: integrally welded on sizes up to 2400 mm on smallest dimension, split for field welding on sizes over 2400 mm on smallest dimension and reinforced for alignment of drive and driven equipment; without supplementary hold down devices; complete with isolation element attached to base brackets arranged to minimize height; pre-drilled holes to receive equipment anchor bolts; and complete with adjustable built-in motor slide rail where indicated.

.2 Type B2 - Steel rail base: structural steel, positioned for alignment of drive and driven equipment; without supplementary hold down devices; complete with isolation element attached to base brackets arranged to minimize height; and pre-drilled holes to receive equipment anchor bolts.

.3 Bases to clear housekeeping pads by 25 mm minimum.

2.10 INERTIA BASE

.1 Type B3 - Full depth perimeter structural or formed channels, frames: welded in place reinforcing rods running in both directions; spring mounted, carried by gussetted height-saving brackets welded to frame; and clear housekeeping pads by 50 mm minimum.

.2 Pump bases: "T" shaped, where applicable, to provide support for elbows.

2.11 SEISMIC CONTROL MEASURES

.1 General:

.1 Following systems and/or equipment to remain operational during and after earthquakes:

.2 Seismic control systems to work in every direction.

.3 Fasteners and attachment points to resist same maximum load as seismic restraint.

.4 Drilled or power driven anchors and fasteners not permitted.

.5 No equipment, equipment supports or mounts to fail before failure of structure.

.6 Supports of cast iron or threaded pipe not permitted.

.2 Static equipment:

.1 Anchor equipment to equipment supports. Anchor equipment supports to structure.

.2 Suspended equipment:

.1 Use one or more of following methods:

.1 Install tight to structure.

.2 Cross brace in every direction.

.3 Brace back to structure.

.4 Cable restraint system.

.3 Seismic restraints:

.1 Cushioning action gentle and steady.

.2 Never reach metal-like stiffness.

.3 Vibration isolated equipment:

.1 Seismic control measures not to jeopardize noise and vibration isolation systems. Provide 6 to 9 mm clearance during normal operation of equipment and systems between seismic restraint and equipment.

.2 Incorporate seismic restraints into vibration isolation system to resist complete isolator unloading.

.3 As indicated.

.4 Piping systems:

.1 Piping systems: hangers longer than 305 mm; brace at each hanger.

.2 Compatible with requirements for anchoring and guiding of piping systems.

.5 Bracing methods:

.1 Approved by Consultant.

.2 Structural angles or channels.

.3 Cable restraint system incorporating grommets, shackles and other hardware to ensure alignment of restraints and to avoid bending of cables at connection points. Incorporate neoprene into cable connections to reduce shock loads.

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 datasheet.

3.2 INSTALLATION

.1 Seismic control measures to meet requirements of NBC.

.2 Install vibration isolation equipment in accordance with manufacturers instructions and adjust mountings to level equipment.

.3 Ensure piping, ducting and electrical connections to isolated equipment do not reduce system flexibility and that piping, conduit and ducting passage through walls and floors do not transmit vibrations.

.4 Unless indicated otherwise, support piping connected to isolated equipment with spring mounts or spring hangers with 25 mm minimum static deflection as follows:

.1 Up to NPS4: first 3 points of support. NPS5 to NPS8: first 4 points of support. NPS10 and Over: first 6 points of support.

.2 First point of support: static deflection of twice deflection of isolated equipment, but not more than 50 mm.

.5 Where isolation is bolted to floor use vibration isolation rubber washers.

.6 Block and shim level bases so that ductwork and piping connections can be made to rigid system at operating level, before isolator adjustment is made. Ensure that there is no physical contact between isolated equipment and building structure.

3.3 FIELD QUALITY CONTROL

.1 Inspection and Certification:

.1 Experienced and competent sound and vibration testing professional engineer to take vibration measurement for HVAC system after start up and TAB of systems.

.2 Take vibration measurements for the water towers.

.3 Establish adequacy of equipment isolation and acceptability of noise levels in occupied areas and where appropriate, remedial recommendations (including sound curves).

.4 Submit complete report of test results.

3.4 CLEANING

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

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 Materials and requirements for the identification of piping systems, duct work, valves and controllers, including the installation and location of identification systems.

.2 Related Requirements

.1 Section 23 05 00 applies to the present section.

1.2 REFERENCE STANDARDS

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.60, Interior Alkyd Gloss Enamel.

.2 CAN/CGSB-24.3, Identification of Piping Systems.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Product data to include paint colour chips, other products specified in this section.

PART 2 PRODUCTS

2.1 MANUFACTURER'S EQUIPMENT NAMEPLATES

.1 Metal or plastic laminate nameplate mechanically fastened to each piece of equipment by manufacturer.

.2 Lettering and numbers raised or recessed.

.3 Information to include, as appropriate:

.1 Equipment: manufacturer's name, model, size, serial number, capacity.

.2 Motor: voltage, Hz, phase, power factor, duty, frame size.

2.2 SYSTEM NAMEPLATES

.1 Colours:

.1 Hazardous: red letters, white background.

.2 Elsewhere: black letters, white background (except where required otherwise by applicable codes).

.2 Construction:

.1 3 mm thick, laminated plastic or white anodized aluminum, matte finish, with square corners, letters accurately aligned and machine engraved into core.

.3 Sizes:

.1 Conform to following table:

Size #	Sizes (mm)	No. of Lines	Height of Letters (mm)
1	10 x 50	1	3
2	13 x 75	1	5
3	13 x 75	2	3
4	20 x 100	1	8
5	20 x 100	2	5
6	20 x 200	1	8
7	25 x 125	1	12
8	25 x 125	2	8
9	35 x 200	1	20

.2 Use maximum of 25 letters/numbers per line.

.4 Locations:

.1 Terminal cabinets, control panels: use size # 5.

.2 Equipment in Mechanical Rooms: use size # 9.

.5 Identification for PSPC Preventive Maintenance Support System (PMSS):

.1 Use arrangement of Main identifier, Source identifier, Destination identifier.

.2 Equipment in Mechanical Room:

.1 Main identifier: size #9.

.2 Source and Destination identifiers: size #6.

.3 Terminal cabinets, control panels: size #5.

.3 Equipment elsewhere: sizes as appropriate.

2.3 EXISTING IDENTIFICATION SYSTEMS

.1 Apply existing identification system to new work.

.2 Where existing identification system does not cover for new work, use identification system specified this section.

.3 Before starting work, obtain written approval of identification system DCC Representative.

2.4 IDENTIFICATION OF PIPING SYSTEMS

.1 Identify contents by background colour marking, pictogram (as necessary), legend; direction of flow by arrows. To CAN/CGSB 24.3 except where specified otherwise.

.2 Legend:

.1 Block capitals to sizes and colours listed in CAN/CGSB 24.3.

.3 Arrows showing direction of flow:

.1 Outside diameter of pipe or insulation less than 75 mm: 100 mm long x 50 mm high.

.2 Outside diameter of pipe or insulation 75 mm and greater: 150 mm long x 50 mm high.

.3 Use double-headed arrows where flow is reversible.

.4 Extent of background colour marking:

.1 To full circumference of pipe or insulation.

.2 Length to accommodate pictogram, full length of legend and arrows.

.5 Materials for background colour marking, legend, arrows:

.1 Pipes and tubing 20 mm and smaller: waterproof and heat-resistant pressure sensitive plastic marker tags.

.2 Other pipes: pressure sensitive plastic-coated cloth or vinyl with protective overcoating, waterproof contact adhesive undercoating, suitable for ambient of 100% RH and continuous operating temperature of 150 degrees C and intermittent temperature of 200 degrees C.

.6 Colours and Legends:

.1 Where not listed, obtain direction from DCC Representative.

2.5 IDENTIFICATION DUCTWORK SYSTEMS

.1 50 mm high stencilled letters and directional arrows 150 mm long x 50 mm high.

.2 Colours: back, or co-ordinated with base colour to ensure strong contrast.

2.6 VALVES, CONTROLLERS

.1 Brass tags with 12 mm stamped identification data filled with black paint.

.2 Include flow diagrams for each system, of approved size, showing charts and schedules with identification of each tagged item, valve type, service, function, normal position, location of tagged item.

2.7 CONTROLS COMPONENTS IDENTIFICATION

.1 Identify all systems, equipment, components, controls, sensors with system nameplates specified in this section.

.2 Inscriptions to include function and (where appropriate) fail-safe position.

2.8 LANGUAGE

.1 Identification in French.

.2 Use one nameplate and label for each language.

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 datasheet.

3.2 TIMING

.1 Provide identification only after painting has been completed.

3.3 INSTALLATION

.1 Perform work in accordance with CAN/CGSB-24.3 except as specified otherwise.

.2 Provide ULC and CSA registration plates as required by respective agency.

.3 Identify systems, equipment to conform to PWGSC PMSS.

3.4 NAMEPLATES

.1 Locations:

.1 In conspicuous location to facilitate easy reading and identification from operating floor.

.2 Standoffs:

.1 Provide for nameplates on hot and/or insulated surfaces.

.3 Protection:

.1 Do not paint, insulate or cover.

3.5 LOCATION OF IDENTIFICATION ON PIPING AND DUCTWORK SYSTEMS

.1 On long straight runs in open areas in boiler rooms, equipment rooms, galleries, tunnels: at not more than 17 m intervals and more frequently if required to ensure that at least one is visible from any one viewpoint in operating areas and walking aisles.

.2 Adjacent to each change in direction.

.3 At least once in each small room through which piping or ductwork passes.

.4 On both sides of visual obstruction or where run is difficult to follow.

.5 On both sides of separations such as walls, floors, partitions.

.6 Where system is installed in pipe chases, ceiling spaces, galleries, confined spaces, at entry and exit points, and at access openings.

.7 At beginning and end points of each run and at each piece of equipment in run.

.8 At point immediately upstream of major manually operated or automatically controlled valves, and dampers. Where this is not possible, place identification as close as possible, preferably on upstream side.

.9 Identification easily and accurately readable from usual operating areas and from access points.

.1 Position of identification approximately at right angles to most convenient line of sight, considering operating positions, lighting conditions, risk of physical damage or injury and reduced visibility over time due to dust and dirt.

3.6 VALVES, CONTROLLERS

.1 Valves and operating controllers, except at plumbing fixtures, radiation, or where in plain sight of equipment they serve: Secure tags with non-ferrous chains or closed "S" hooks.

.2 Install one copy of flow diagrams, valve schedules mounted in frame behind non-glare glass where directed by DCC Representative. Provide one copy (reduced in size if required) in each operating and maintenance manual.

.3 Number valves in each system consecutively.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 TAB is used throughout this Section to describe the process, methods and requirements of testing, adjusting and balancing for HVAC.

.2 TAB means to test, adjust and balance to perform in accordance with requirements of Contract Documents and to do other work as specified in this section.

.3 Contractor to take hydronic flow and air readings on existing systems prior to demolition for performance comparison at end of work.

1.2 QUALIFICATIONS OF TAB PERSONNEL

.1 Provide documentation confirming qualifications, successful experience.

.2 Recommendations and suggested practices contained in the TAB Standard: mandatory.

.3 Use TAB Standard provisions, including checklists, and report forms to satisfy Contract requirements.

.4 Use TAB Standard for TAB, including qualifications for TAB Firm and Specialist and calibration of TAB instruments.

.5 Where instrument manufacturer calibration recommendations are more stringent than those listed in TAB Standard, use manufacturer's recommendations.

.6 TAB Standard quality assurance provisions such as performance guarantees form part of this contract.

.1 For systems or system components not covered in TAB Standard, use TAB procedures developed by TAB Specialist.

1.3 PURPOSE OF TAB

.1 Test to verify proper and safe operation, determine actual point of performance, evaluate qualitative and quantitative performance of equipment, systems and controls at design, average and low loads using actual or simulated loads

.2 Adjust and regulate equipment and systems to meet specified performance requirements and to achieve specified interaction with other related systems under normal and emergency loads and operating conditions.

.3 Balance systems and equipment to regulate flow rates to match load requirements over full operating ranges.

1.4 CO-ORDINATION

.1 Schedule time required for TAB (including repairs, re-testing) into project construction and completion schedule to ensure completion before acceptance of project.

.2 Do TAB of each system independently and subsequently, where interlocked with other systems, in unison with those systems.

1.5 START-UP

.1 Follow start-up procedures as recommended by equipment manufacturer unless specified otherwise.

.2 Follow special start-up procedures specified elsewhere in Division 23.

1.6 OPERATION OF SYSTEMS DURING TAB

.1 Operate systems for length of time required for TAB and as required for verification of TAB reports.

1.7 START OF TAB

.1 Notify the Consultant 7 days prior to start of TAB.

.2 Start TAB when building is essentially completed, including:

.3 Application of weather stripping, sealing, and caulking.

.4 Pressure, leakage, other tests specified elsewhere Division 23.

.5 Provisions for TAB installed and operational.

.6 Start-up, verification for proper, normal and safe operation of mechanical and associated electrical and control systems affecting TAB including but not limited to:

.1 Proper thermal overload protection in place for electrical equipment.

.2 Air systems:

.1 Filters in place, clean.

.2 Duct systems clean.

.3 Ducts, air shafts, ceiling plenums are airtight to within specified tolerances.

.4 Correct fan rotation.

.5 Volume control dampers installed and open.

.6 Coil fins combed, clean.

.7 Access doors, installed, closed.

.8 Outlets installed, volume control dampers open.

.3 Liquid systems:

.1 Flushed, filled, vented.

.2 Correct pump rotation.

.3 Strainers in place, baskets clean.

.4 Isolating and balancing valves installed, open.

.5 Calibrated balancing valves installed, at factory settings.

.6 Chemical treatment systems complete, operational.

1.8 APPLICATION TOLERANCES

.1 Perform testing, tuning and balancing of systems to obtain results with no more than the following deviations, plus or minus, from the theoretical values.

1.9 ACCURACY TOLERANCES

.1 Measured values accurate to within plus or minus 2 % of actual values.

1.10 INSTRUMENTS

.1 Calibrate in accordance with requirements of most stringent of referenced standard for either applicable system or HVAC system.

1.11 PRELIMINARY TAB REPORT

.1 Submit for checking and approval of Consultant, prior to submission of formal TAB report, sample of rough TAB sheets. Include:

.1 Details of instruments used.

.2 Details of TAB procedures employed.

.3 Calculations procedures.

.4 Summaries.

1.12 TAB REPORT

.1 Format in accordance with referenced standards.

.2 TAB report to show results in SI units and to include:

.1 Project record drawings.

.2 System schematics.

.3 Submit TAB Report to the Consultant for verification and approval.

1.13 SETTINGS

.1 After TAB is completed to satisfaction of the Consultant, replace drive guards, close access doors, lock devices in set positions, ensure sensors are at required settings.

.2 Permanently mark settings to allow restoration at any time during life of facility. Do not eradicate or cover markings.

1.14 COMPLETION OF TAB

.1 TAB considered complete when final TAB Report received and approved by Consultant .

1.15 OTHER TAB REQUIREMENTS

.1 General requirements applicable to work specified this paragraph:

.1 Qualifications of TAB personnel: as for air systems specified this section.

.2 Quality assurance: as for air systems specified this section.

.2 Measurement of noise and vibration from equipment specified in Division 23.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 23 05 00 applies to the present section.

1.2 REFERENCE STANDARDS

.1 American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

.1 ANSI/ASHRAE/IESNA 90.1, SI; Energy Standard for Buildings Except Low-Rise Residential Buildings.

.2 ASTM International (ASTM)

.1 ASTM B209M, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).

.2 ASTM C335, Standard Test Method for Steady State Heat Transfer Properties of Pipe Insulation.

.3 ASTM C411, Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.

.4 ASTM C449/C449M, Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.

.5 ASTM C547, Standard Specification for Mineral Fiber Pipe Insulation.

.6 ASTM C553, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.

.7 ASTM C612, Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

.8 ASTM C795, Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.

.9 ASTM C921, Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.

.3 Canadian General Standards Board (CGSB)

.1 CGSB 51-GP-52Ma, Vapour Barrier, Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.

.4 Green Seal Environmental Standards (GSES)

.1 Standard GS-36, Commercial Adhesives.

.5 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168, Adhesive and Sealant Applications.

.6 Thermal Insulation Association of Canada (TIAC): National Insulation Standards (2005).

.7 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.2 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3 DEFINITIONS

.1 For purposes of this section:

.1 "CONCEALED" - insulated mechanical services and equipment in suspended ceilings and non-accessible chases and furred-in spaces.

.2 "EXPOSED" - means "not concealed" as previously defined.

.3 Insulation systems - insulation material, fasteners, jackets, and other accessories.

.2 TIAC Codes:

.1 CRD: Code Round Ductwork,

.2 CRF: Code Rectangular Finish.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Provide manufacturer's printed product literature and datasheets for duct insulation, and include product characteristics, performance criteria, physical size, finish and limitations.

.1 Description of equipment giving manufacturer's name, type, model, year and capacity.

.2 Details of operation, servicing and maintenance.

.3 Recommended spare parts list.

.2 Manufacturers' Instructions:

.1 Provide manufacture's written duct insulation jointing recommendations. and special handling criteria, installation sequence, cleaning procedures.

PART 2 PRODUCTS

2.1 FIRE AND SMOKE RATING

.1 To CAN/ULC-S102:

.1 Maximum flame spread rating: 25.

.2 Maximum smoke developed rating: 50.

2.2 INSULATION

.1 Mineral fibre: as specified includes glass fibre, rock wool, slag wool.

.2 Thermal conductivity ("k" factor) not to exceed specified values at 24 degrees C mean temperature when tested in accordance with ASTM C335.

.3 TIAC Code C-1: Rigid mineral fibre board to ASTM C612, with factory applied vapour retarder jacket to CGSB 51-GP-52Ma (as scheduled in PART 3 of this Section).

.4 TIAC Code C-2: Mineral fibre blanket to ASTM C553 faced with factory applied vapour retarder jacket to CGSB 51-GP-52Ma (as scheduled in PART 3 of this section).

.1 Mineral fibre: to ASTM C553.

.2 Jacket: to CGSB 51-GP-52Ma.

.3 Maximum "k" factor: to ASTM C553.

.5 TIAC Code A-3: rigid moulded mineral fibre with factory applied vapour retarder jacket.

.1 Mineral fibre: to CAN/ULC-S702.

.2 Jacket: to CGSB 51-GP-52Ma.

.3 Maximum "k" factor: to CAN/ULC-S702.

2.3 JACKETS

.1 Polyvinyl Chloride (PVC):

.1 One-piece moulded type to CAN/CGSB-51.53 with pre-formed shapes as required.

.2 Colours: white.

.3 Minimum service temperatures: -20 degrees C.

.4 Maximum service temperature: 65 degrees C.

.5 Moisture vapour transmission: 0.02 perm.

.6 Thickness: 0.5 mm.

.7 Fastenings:

.1 Use solvent weld adhesive compatible with insulation to seal laps and joints.

.2 Tacks.

.3 Pressure sensitive vinyl tape of matching colour.

.2 Lagging adhesive: compatible with insulation.

.1 Maximum VOC limit 200 g/L to GSES GS-36.

2.4 ACCESSORIES

.1 Lap adhesive:

.1 Water based, fire retardant type, compatible with insulation.

.1 Maximum VOC limit 200 to GSES GS-36.

.2 Indoor Vapour Retarder Finish:

.1 Vinyl emulsion type acrylic, compatible with insulation.

.3 Insulating Cement: hydraulic setting on mineral wool, to ASTM C449.

.4 ULC Listed Canvas Jacket:

.1 220 gm/m^2cotton, plain weave, treated with dilute fire-retardant lagging adhesive to ASTM C921.

.5 Tape: self-adhesive, aluminum, plain, 75 mm wide minimum.

.6 Tie wire: 1.5 mm stainless steel.

.7 Banding: 19 mm wide, 0.5 mm thick stainless steel.

.8 Facing: 25 mm galvanized steel hexagonal wire mesh stitched on one face of insulation with expanded metal lath on other face.

.9 Fasteners: 4 mm diameter pins with 35 mm square clips, length to suit thickness of insulation.

PART 3 EXECUTION

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 PRE-INSTALLATION REQUIREMENTS

.1 Pressure test ductwork systems complete, witness and certify.

.2 Ensure surfaces are clean, dry, free from foreign material.

3.3 INSTALLATION

.1 Install in accordance with TIAC National Standards.

.2 Apply materials in accordance with manufacturers instructions and as indicated.

.3 Use 2 layers with staggered joints when required nominal thickness exceeds 75 mm.

.4 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.

.1 Ensure hangers, and supports are outside vapour retarder jacket.

.5 Hangers and supports in accordance with Section 23 05 29- Hangers and Supports for HVAC Piping and Equipment.

.1 Apply high compressive strength insulation where insulation may be compressed by weight of ductwork.

.6 Fasteners: install at 300 mm on centre in horizontal and vertical directions, minimum 2 rows each side.

3.4 REMOVABLE, PRE-FABRICATED, INSULATION AND ENCLOSURES

.1 Application: to install on flanges and unions connecting pipes to serviced appliances and valves.

.2 Design: to permit movement of expansion joint without damage to adjacent insulation.

.3 Insulation:

.1 Insulation, fastenings and finishes: same as system.

.2 Jacket: PVC.

3.5 DUCTWORK INSULATION SCHEDULE

.1 Insulation types and thicknesses: conform to following table:

	Code ACIT	Pare-Vapeur	Épaisseur (mm)
Rectangular cold and dual temperature supply air ducts	C-1	Yes	50
Exhaust duct between dampers and louvres	C-1	No	25

.2 TIAC Code: A-3.

.1 Securements: Tape at 300 mm on centre.

.2 Seals: VR lap seal adhesive, VR lagging adhesive.

.3 Installation: TIAC Code: 1501-C.

.3 Thickness of insulation as listed in following table.

.1 Run-outs to individual units and equipment not exceeding 4000 mm long.

Application	Temp. degrees Celsius	TIAC Code	Pipe sizes (NPS) and insulation thickness (0 to 65 mm)
Chilled Water	4 - 13	A-3	25
Domestic CWS	4 - 13	A-3	25
Domestic CWS with vapour retarder	4 - 13	C-2	25

3.6 CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 23 05 00 applies to the current section.

1.2 CLEANING AND START-UP OF MECHANICAL PIPING SYSTEMS

.1 In accordance with Section 23 08 02- Cleaning and Start-up of Mechanical Piping Systems.

1.3 SYSTEM PERFORMANCE VERIFICATION (PV)

.1 Perform systems performance verification after cleaning is completed and system is in full operation.

.2 When systems are operational, perform following tests:

.1 Conduct full scale tests at maximum design flow rates, temperatures and pressures for continuous consecutive period of 48 hours to demonstrate compliance with design criteria.

.2 Verify performance of hydronic system circulating pumps as specified, recording system pressures, temperatures, fluctuations by simulating maximum design conditions and varying.

.1 Pump operation.

.2 Boiler and/or chiller operation.

.3 Pressure bypass open/closed.

.4 Control pressure failure.

.5 Maximum heating demand.

.6 Maximum cooling demand.

.7 Boiler and/or chiller failure.

.8 Cooling tower (and/or industrial fluid cooler) fan failure.

.9 Outdoor reset. Re-check heat exchanger output supply temperature at 100% and 50% reset, maximum water temperature.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

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PART 1 GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 Procedures and cleaning solutions for cleaning mechanical piping systems.

.2 Related Requirements

.1 Section 23 05 00 applies to the current section.

PART 2 PRODUCTS

2.1 CLEANING SOLUTIONS

.1 Tri-sodium phosphate: 0.40 kg per 100 L water in system.

.2 Sodium carbonate: 0.40 kg per 100 L water in system.

.3 Low-foaming detergent: 0.01 kg per 100 L water in system.

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 datasheet.

3.2 CLEANING HYDRONIC SYSTEMS

.1 Timing: systems operational, hydrostatically tested and with safety devices functional, before cleaning is carried out.

.2 Cleaning Agency:

.1 Retain qualified water treatment specialist to perform system cleaning.

.3 Install instrumentation such as flow meters, orifice plates, pitot tubes, flow metering valves only after cleaning is certified as complete.

.4 Cleaning procedures:

.1 Provide detailed report outlining proposed cleaning procedures at least 4 weeks prior to proposed starting date. Report to include:

.1 Cleaning procedures, flow rates, elapsed time.

.2 Chemicals and concentrations used.

.3 Inhibitors and concentrations.

.4 Specific requirements for completion of work.

.5 Special precautions for protecting piping system materials and components.

.6 Complete analysis of water used to ensure water will not damage systems or equipment.

.5 Conditions at time of cleaning of systems:

.1 Systems: free from construction debris, dirt and other foreign material.

.2 Control valves: operational, fully open to ensure that terminal units can be cleaned properly.

.3 Strainers: clean prior to initial fill.

.4 Install temporary filters on pumps not equipped with permanent filters.

.5 Install pressure gauges on strainers to detect plugging.

.6 Report on Completion of Cleaning:

.1 When cleaning is completed, submit report, complete with certificate of compliance with specifications of cleaning component supplier.

.7 Hydronic Systems:

.1 Fill system with water, ensure air is vented from system.

.2 Fill expansion tanks 1/3 to 1/2 full, charge system with compressed air to at least 35 kPa (does not apply to diaphragm type expansion tanks).

.3 Use water metre to record volume of water in system to +/- 0.5%.

.4 Add chemicals under direct supervision of chemical treatment supplier.

.5 Closed loop systems: circulate system cleaner at 60 degrees C for at least 36 h. Drain as quickly as possible. Refill with water and inhibitors. Test concentrations and adjust to recommended levels.

.6 Flush velocity in system mains and branches to ensure removal of debris. System pumps may be used for circulating cleaning solution provided that velocities are adequate.

.7 Add chemical solution to system.

3.3 START-UP OF HYDRONIC SYSTEMS

.1 After cleaning is completed and system is filled:

.1 Establish circulation and expansion tank level, set pressure controls.

.2 Ensure air is removed.

.3 Check pumps to be free from air, debris, possibility of cavitation when system is at design temperature.

.4 Dismantle system pumps used for cleaning, inspect, replace worn parts, install new gaskets and new set of seals.

.5 Clean out strainers repeatedly until system is clean.

.6 Check water level in expansion tank with cold water with circulating pumps OFF and again with pumps ON.

.7 Repeat with water at design temperature.

.8 Check pressurization to ensure proper operation and to prevent water hammer, flashing, cavitation. Eliminate water hammer and other noises.

.9 Bring system up to design temperature and pressure over a 48 hour period.

.10 Perform TAB as specified in Section 23 05 93- Testing, Adjusting and Balancing for HVAC.

.11 Adjust pipe supports, hangers, springs as necessary.

.12 Monitor pipe movement, performance of expansion joints, loops, guides, anchors.

.13 Re-tighten bolts using torque wrench, to compensate for heat-caused relaxation. Repeat several times during commissioning.

.14 Check operation of drain valves.

.15 Adjust valve stem packings as systems settle down.

.16 Fully open balancing valves (except those that are factory-set).

.17 Check operation of over-temperature protection devices on circulating pumps.

.18 Adjust alignment of piping at pumps to ensure flexibility, adequacy of pipe movement, absence of noise or vibration transmission.

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 23 05 00 applies to the current section.

1.2 REFERENCE STANDARDS

.1 American National Standards Institute/American Water Works Association (ANSI/AWWA)

.1 ANSI/AWWA C111/A21.11, Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.2 American Society of Mechanical Engineers (ASME)

.1 ASME B16.1, Grey Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.

.2 ASME B16.3, Malleable Iron Threaded Fittings: Classes 150 and 300.

.3 ASME B16.5, Pipe Flanges and Flanged Fittings: NPS ½ through NPS 24 Metric/Inch Standard.

.4 ASME B16.9, Factory-Made Wrought Buttwelding Fittings.

.5 ASME B18.2.1, Square Hex, Heavy Hex and Askew Head Bolts and Hex, Heavy Hex, Hex Flange. Loded Head and Lag Screws (Inch Series).

.6 ASME B18.2.2, Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series).

.3 ASTM International (ASTM)

.1 ASTM A47/A47M, Standard Specification for Ferritic Malleable Iron Castings.

.2 ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless.

.3 ASTM A536, Standard Specification for Ductile Iron Castings.

.4 ASTM B61, Standard Specification for Steam or Valve Bronze Castings.

.5 ASTM B62, Standard Specification for Composition Bronze or Ounce Metal Castings.

.6 ASTM E202, Standard Test Method for Analysis of Ethylene Glycols and Propylene Glycols.

.4 CSA Group (CSA)

.1 CSA B242-[05(R2011)] , Groove and Shoulder Type Mechanical Pipe Couplings.

.2 CSA W48-[06] , Filler Metals and Allied Materials for Metal Arc Welding.

.5 Manufacturer's Standardization of the Valve and Fittings Industry (MSS)

.1 MSS-SP-67, Butterfly Valves.

.2 MSS-SP-70, Grey Iron Gate Valves, Flanged and Threaded Ends.

.3 MSS-SP-71, Grey Iron Swing Check Valves Flanged and Threaded Ends.

.4 MSS-SP-80, Bronze Gate, Globe, Angle and Check Valves.

.5 MSS-SP-85, Grey Iron Globe and Angle Valves, Flanged and Threaded Ends.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for hydronic systems and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Shop Drawings:

.1 Indicate on drawings:

.1 Components and accessories.

PART 2 PRODUCTS

2.1 PIPE

.1 Steel pipe: to ASTM A53/A53M, Grade B, as follows:

.1 To NPS 6: Schedule 4.

2.2 PIPE JOINTS

.1 NPS 2 and under: screwed fittings with PTFE tape.

.2 NPS 2-1/2 and over: welding fittings and flanges to CSA W48.

.3 Flanges: plain to ANSI/AWWA C111/ A21.11.

.4 Orifice flanges: slip-on raised face, 2100 kPa.

.5 Flange gaskets: ANSI/AWWA C111/ A21.11.

.6 Pipe thread: taper.

.7 Bolts and nuts: to ASME B18.2.1 or ASME B18.2.2.

.8 Roll grooved coupling gaskets: type EPDM.

2.3 FITTINGS

.1 Screwed fittings: malleable iron, to ASME B16.3, Class 150.

.2 Pipe flanges and flanged fittings:

.1 Cast iron: to ASME B16.1, Class 125.

.2 Steel: to ASME B16.5.

.3 Butt-welding fittings: steel, to ASME B16.9.

.4 Unions: malleable iron, to ASTM A47/A47M and ASME B16.3.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for hydronic systems installation in accordance with manufacturer's written instructions.

3.2 INSTALLATION OF PIPING

.1 Install piping in accordance with Section 23 05 15 - Common installation requirements for HVAC pipework

3.3 CIRCUIT BALANCING VALVES

.1 Install flow measuring stations and flow balancing valves as indicated.

.2 Remove handwheel after installation and when TAB is complete.

.3 Tape joints in prefabricated insulation on valves installed in chilled water mains.

3.4 CLEANING, FLUSHING AND START-UP

.1 In accordance with Section 23 08 02 – Cleaning and Start-Up of Mechanical Piping Systems.

3.5 TESTING

.1 Test system in accordance with Section 23 05 00 - Common Work Results for HVAC.

3.6 BALANCING

.1 Balance water systems to within plus or minus 5 % of design output.

.2 In accordance with Section 23 05 93- Testing, Adjusting and Balancing for HVAC for applicable procedures.

3.7 PERFORMANCE VERIFICATION

.1 In accordance with Section 23 08 01- Performance Verification Mechanical Piping Systems.

3.8 CLEANING

.1 Leave Work area clean at end of each day.

.2 Remove recycling bins and bins from site and dispose of materials at appropriate facilities.

3.9 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by hydronic systems installation.

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 23 05 00 applies to the present section.

1.2 REFERENCE STANDARDS

.1 American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

.2 ASTM International (ASTM)

.1 ASTM A480/A480M, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.

.2 ASTM A635/A635M, Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Alloy, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability, General Requirements for.

.3 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

.3 Green Seal Environmental Standards (GS)

.1 GS-36, Standard for Adhesives for Commercial Use.

.4 National Fire Protection Association (NFPA)

.1 NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems.

.2 NFPA 90B, Standard for the Installation of Warm Air Heating and Air-Conditioning Systems.

.3 NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

.5 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

.1 SMACNA HVAC Duct Construction Standards - Metal and Flexible.

.2 SMACNA HVAC Air Duct Leakage Test Manual.

.3 IAQ Guideline for Occupied Buildings Under Construction.

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1168, Adhesives and Sealants Applications.

PART 2 PRODUCTS

2.1 SEAL CLASSIFICATION

.1 Classification as follows:

Maximum Pressure Pa	Seal Class SMACNA
500	C
250	C
125	C
125	Unsealed

.2 Seal classification:

.1 Class A: longitudinal seams, transverse joints, duct wall penetrations and connections made airtight with sealant and tape.

.2 Class B: longitudinal seams, transverse joints and connections made airtight with tape or combination thereof.

.3 Class C: transverse joints and connections made air tight with gaskets, tape, or combination thereof sealant. Longitudinal seams unsealed.

.4 Unsealed seams and joints.

2.2 SEALANT

.1 Sustainability Characteristics:

.1 Adhesives and sealants: VOC limit 250 g/L maximum.

.2 Sealant: oil resistant, water borne, polymer type flame resistant duct sealant. Temperature range of minus 30 degrees C to plus 93 degrees C.

2.3 TAPE

.1 Tape: polyvinyl treated, open weave fiberglass tape, 50 mm wide.

2.4 DUCT LEAKAGE

.1 In accordance with SMACNA HVAC Air Duct Leakage Test Manual.

2.5 FITTINGS

.1 Fabrication: to SMACNA.

2.6 GALVANIZED STEEL

.1 Lock forming quality: to ASTM A653/A653M, Z90 zinc coating.

.2 Thickness, fabrication and reinforcement: to SMACNA and ASHRAE.

.3 Joints: to SMACNA and ASHRAE.

2.7 HANGERS AND SUPPORTS

.1 Hangers and Supports: in accordance with Section 23 05 29 – Hangers and Supports for HVAC Piping and Equipment.

.1 Strap hangers: of same material as duct but next sheet metal thickness heavier than duct.

.1 Maximum size duct supported by strap hanger: 500.

.2 Hanger configuration: to ASHRAE and SMACNA.

.3 Hangers: galvanized steel angle with galvanized steel rods to following table:

Duct Size (mm)	Angle Size (mm)	Rod Size (mm)
up to 750	25 x 25 x 3	6
751 to 1050	40 x 40 x 3	6
1051 to 1500	40 x 40 x 3	10
1501 to 2100	50 x 50 x 3	10
2101 to 2400	50 x 50 x 5	10
2401 and over	50 x 50 x 6	10

.4 Upper hanger attachments:

.1 For concrete: manufactured concrete inserts.

.2 For steel joist: manufactured joist clamp and steel plate washer.

.3 For steel beams: manufactured beam clamps:

2.8 MULTI-LEAF DAMPERS

.1 Parallel blade type as indicated.

.2 Extruded aluminum or Structurally formed steel, interlocking blades, complete with extruded vinyl seals, spring stainless steel side seals, extruded aluminum frame.

.3 Pressure fit self-lubricated bronze bearings.

.4 Linkage: plated steel tie rods, brass pivots and plated steel brackets, complete with plated steel control rod.

.5 Performance:

.1 Leakage: in closed position less than 2% of rated air flow at pressure differential of the system.

.2 Pressure drop: at full open position minimal

.6 Insulated aluminum dampers:

.1 Frames: insulated with extruded polystyrene foam with RSI 0.88.

.2 Blades: constructed from aluminum extrusions with internal hollows insulated with polyurethane or polystyrene foam, RSI 0.88.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for metal duct installation in accordance with manufacturer's written instructions.

3.2 GENERAL

.1 Do work in accordance to SMACNA.

.2 Do not break continuity of insulation vapour barrier with hangers or rods.

.1 Insulate strap hangers 100 mm beyond insulated duct. Ensure diffuser is fully seated.

.3 Support risers in accordance to SMACNA.

.4 Install proprietary manufactured flanged duct joints in accordance with manufacturer's instructions.

3.3 HANGERS

.1 Strap hangers: install in accordance with SMACNA.

.2 Angle hangers: complete with locking nuts and washers.

.3 Hanger spacing: in accordance with as follows:

Duct Size (mm)	Spacing (mm)
to 1500	3000
1501 and over	2500

3.4 WATERTIGHT DUCT

.1 Provide watertight duct for:

.1 Fresh air intake of the towers.

.2 Form bottom of horizontal duct without longitudinal seams.

.1 Weld joints of bottom and side sheets.

.2 Seal other joints with duct sealer.

3.5 SEALING AND TAPING

.1 Apply sealant in accordance with SMACNA.

.2 Bed tape in sealant and recoat with minimum of 1 coat of sealant to manufacturers recommendations.

3.6 LEAKAGE TESTS

.1 In accordance with SMACNA HVAC Duct Leakage Test Manual.

.2 Make trial leakage tests as instructed to demonstrate workmanship.

.3 Complete test before performance insulation or concealment Work.

3.7 INSTALLATION OF THE DAMPERS

.1 Install where indicated.

.2 Install in accordance with recommendations of SMACNA and manufacturer's instructions.

.3 Seal multiple damper modules with silicon sealant.

.4 Install access door adjacent to each damper. See Section 23 33 00- Air Duct Accessories.

.5 Ensure dampers are observable and accessible.

3.8 CLEANING

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 23 05 00 applies to the present section.

1.2 REFERENCE STANDARDS

.1 ASTM International (ASTM)

.1 ASTM A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.2 ASTM C547, Standard Specification for Mineral Fiber Pipe Insulation.

.2 Cooling Technology Institute (CTI)

.1 CTI-ATC-105, Acceptance Test Code.

.2 CTI-STD-201, Standard for the Certification of Commercial Water Cooling Tower Thermal Performance.

.3 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102.2, Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Shop Drawings:

.1 Indicate on drawings:

.1 Connections, piping and fittings, valves, strainers, control assemblies and ancillaries, identifying factory and field assembled.

.2 Wiring as assembled and schematically.

.3 Dimensions, construction details, recommended installation and support, mounting bolt hole sizes and locations and point loads.

.4 Vibration and seismic control measures.

.5 Manufacturer's recommended clearances.

1.4 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: submit operation and maintenance data for cooling towers for incorporation into manual.

.1 Include:

.1 Description of equipment giving manufacturers name, model type and year, capacity.

.2 Start-up and commissioning procedures.

.3 Details of operation, servicing and maintenance.

.4 Recommended spare parts list.

1.5 MAINTENANCE MATERIAL SUBMITTALS

.1 Fan belts.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Coordinate the delivery with the installation schedule. No storage space.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Closed circuit induced draft crossflow discharge cooling tower. Air suction will be on one side.

.2 Bottom part of tower must be field erected (possibility of going through existing opening).

.3 Top part of the tower can be Factory assembled

.4 Steel: hot-dip galvanized to ASTM A153/A153M, with cut ends coated with zinc rich compound.

.5 Fibre glass reinforced plastic (FRP).

.6 Polyvinyl chloride, (PVC): with flame spread rating of 10, smoke developed of 25, to CAN/ULC-S102.2.

.7 Wood: pressure treated fir.

.8 Galvanized steel type G-235.

2.2 PERFORMANCE

.1 The thermal performance of the water tower will be certified by the Cooling Tower Institute according to Standard STD-201 Certification Standards (CTI) or, otherwise, performance tests will be conducted at the site in accordance with the ATC-105 code of the "ATC-105" Cooling Tower Institute" or by an independent qualified agency. (CTI Certification applies only when the coolant is water).

.2 Capacity: 8.07 L/s water 38.9 C to 31.7C and 22.8C wet bulb.

.3 Pressure drop through distribution headers and nozzles: 1.18 psi.

.4 Current intensity: 10.75 HP/Unit (pond heater does not operate when the circulation pump is running).

.5 Drift loss: maximum 0.002% of water circulated.

.6 Sound pressure level measured at: 5’-0’’ of the air intake: maximum 77 dBA.

2.3 DIMENSIONS

.1 The dimensions must allow entry through the existing opening.

.2 Elements extending beyond the existing opening must be mounted on site.

.3 Take dimensions before issuing shop drawings.

2.4 CASING AND FRAMEWORK

.1 Constructed in galvanized steel sheet G-235 with edges protected by a zinc-rich coating.

.2 The tower will be protected by the Polymer Corrosion Protection System.

.3 Access doors: on both end walls for servicing and maintenance.

2.5 COLD WATER BASIN

.1 The fan basin section will be built of G-235 galvanized steel in full bath and will be protected with the Polymer Corrosion Protection System.

.2 The accessories will include circular access doors, removable large-area screens made of galvanized steel in full bath, with perforations smaller than the sprayer openings, with anti-cavitation device to prevent air entrainment, and brass device for make-up water with a large diameter plastic float for easy adjustment.

2.6 HOT WATER DISTRIBUTION BASIN

.1 The water will be distributed evenly over the entire runoff surface by a spray system consisting of a collector and 40 schedule PVC ramps equipped with plastic sprayers with holes of at least 3/4 x 5/16. The ramps and sprayers will be held in place by rubber rings allowing quick dismantling for cleaning. The collector should allow the installation of external pressure measurement devices. Screw edging sprinklers will not be accepted.

2.7 FILL, ELIMINATORS AND LOUVRES

.1 Provided in easy handling sections, PVC drop removers. They will offer three changes of direction, with finish angle, to direct the air release in contrast to the suction of the fans.

2.8 FANS

.1 Fan

.1 Forward-tilted blade centrifugal fans will be balanced statically and dynamically. The volutes will have contoured hearing for uniform air suction and rectangular diffusers to release for increased fan performance and avoid possible water entry. The fans will be mounted on a steel shaft, supported by self-aligning, high-strength bearings with cast iron bodies.

.2 Fans, scrolls, inclined planes, fan diffusers and bearing supports will be protected and finished with the Polymer Corrosion Protection System.

.2 Motor and transmission:

.1 Each motor will be completely air-cooled (T.E.F.C.) with a ball pad, with a single winding with a 1.15 service factor. Each motor will be mounted on a base that is easily adjustable. The trapezoidal belt transmission will be calculated at 150% of the rated power of each engine. Transmissions and moving parts will be protected by removable panels and mesh in galvanized steel in the middle of a bath and finished with the Polymer Corrosion Protection System.

.3 Pump

.1 A single-block bronze centrifugal pump, with mechanical trim, will be mounted on the basin and fully connected from suction in the basin to the water distribution system. The pump will be installed to allow it to be fully drained.

.4 Closed fan section

.1 The unit will be supplied with a closed section finished with the Polymer Corrosion Protection System.

2.9 WARRANTY

.1 The mechanical equipment will be covered by a five (5) year warranty, offered by Baltimore Aircoil of Canada. If the heating elements supplied with the motor are connected, the engine warranty will be seven (7) years.

This warranty includes the following:

- Equipment supports;

- The fan;
- The fan shaft;
- The bearings;
- pulleys;
- The motor shaft;
- The engine.

2.10 ACCESSORIES

.1 Each tower will be equipped with a set of heating element in the basin to prevent frost when the tower is not in operation. The element set will be of sufficient capacity to keep the water temperature of the basin at 40 degrees F. (4.4 degrees C.) against an ambient temperature of -20 degrees F. (-28.8 degrees C.). The heating element set will be tubular and the terminals will be installed in a moisture-proof housing.

.2 A low-level control provided and installed in the factory will need to be connected to avoid the operation in the event of a low-level condition. A temperature control operating at 110V will be provided and installed in the factory by the manufacturer. The temperature control dial will be calibrated from 0 degrees F. (-18 degrees C.) to 250 degrees F. (121 degrees C.)

.3 All electrical connections, the magnetic contactor, its transformer, heating cables and the required insulation will be the responsibility of the electrical contractor.

.4 External lubrication line

.5 Mechanical float

.6 Basin heating element

.7 Vibration switch: turns off the power to the fan motors when there is too much vibration.

.8 The cooler's spare battery will be mounted in a heavily-thick galvanized steel sheet box and finished with the Polymer Corrosion Protection System. Each exchange section will be removable from the fan section.

.9 The battery itself will be run in a first-quality smooth tube at the manufacturer's factory and will be fully galvanized in the middle of a bath after manufacturing. It will be designed so that the fluid side load loss is low. The tubes will have a slope to facilitate the flow of fluid to the return collector. The exchange battery will have to withstand a test pressure of 375 lbs/2 under water.

2.11 VIBRATION ISOLATORS

.1 Vibration isolation in accordance with Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment.

2.12 ACCEPTABLE PRODUCTS

.1 Acceptable Products: Baltimore Air Coil (BAC) V Series.

2.13 CONTROL PANEL C/W SPEED INVERTER

.1 Supply and install a complete NEMA-1 control panel, completely profiled for installation in the building and including a disconnector, magnetic starters, a contactor for heating element, pump, lamps, indicator lights, switches, alarms, between dams, etc. All the connection is made by division 26 - Electricity.

.2 The basic design is based on the equipment of MGI Technologies Inc. or equivalent.

.3 BacNet MSTP communication.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for cooling tower installation in accordance with manufacturer's written instructions.

3.2 GENERAL

.1 Mount on structural supports and vibration isolators and to manufacturer's recommendations.

.2 Ensure clearance for servicing and maintenance as recommended by manufacturer.

.3 Manufacturer's field service representative to approve installation, to supervise start up and to instruct operators.

3.3 SITE TESTS

.1 Test under actual operating conditions in accordance with CTI-ATC-105 to verify specified performance.

3.4 CLEANING

.1 Leave Work area clean at end of each day.

END OF SECTION

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PART 1 GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 General requirements for building Energy Monitoring and Control System (EMCS) that are common to NMS EMCS Sections.

.2 Related Requirements

.1 General conditions of the contract apply.

1.2 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)/The Instrumentation, Systems and Automation Society (ISA).

.1 ANSI/ISA 5.5, Graphic Symbols for Process Displays.

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

.1 ANSI/IEEE 260.1, American National Standard Letter Symbols Units of Measurement (SI Units, Customary Inch-Pound Units, and Certain Other Units).

.3 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).

.1 ASHRAE STD 135, BACNET - Data Communication Protocol for Building Automation and Control Network.

.4 Canadian Standards Association (CSA Group).

.1 CAN/CSA-Z234.1, Canadian Metric Practice Guide.

.5 Consumer Electronics Association (CEA).

.1 CEA-709.1, Control Network Protocol Specification.

.6 Department of Justice Canada (Jus).

.1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.

.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.7 Electrical and Electronic Manufacturers Association (EEMAC).

.1 EEMAC 2Y-1, Light Grey Colour for Indoor Switch Gear.

.8 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (SDS).

.9 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.3 ABBREVIATIONS AND ACRONYMS

.1 Acronyms used in EMCS:

.1 AEL - Average Effectiveness Level

.2 AI - Analog Input

.3 AIT - Agreement on International Trade

.4 AO - Analog Output
.5 BACnet - Building Automation and Control Network.
.6 BC(s) - Building Controller(s).
.7 BECC - Building Environmental Control Centre.
.8 CAD - Computer Aided Design.
.9 CDL - Control Description Logic.
.10 CDS - Control Design Schematic.
.11 COSV - Change of State or Value.
.12 CPU - Central Processing Unit.
.13 DI - Digital Input.
.14 DO - Digital Output.
.15 DP - Differential Pressure.
.16 ECU - Equipment Control Unit.
.17 EMCS - Energy Monitoring and Control System.
.18 HVAC - Heating, Ventilation, Air Conditioning.
.19 IDE - Interface Device Equipment.
.20 I/O - Input/Output.
.21 ISA - Industry Standard Architecture.
.22 LAN - Local Area Network.
.23 LCU - Local Control Unit.
.24 MCU - Master Control Unit.
.25 NAFTA - North American Free Trade Agreement.
.26 NC - Normally Closed.
.27 NO - Normally Open.
.28 OS - Operating System.
.29 O&M - Operation and Maintenance.
.30 OWS - Operator Work Station.
.31 PC - Personal Computer.
.32 PCI - Peripheral Control Interface.
.33 PCMCIA - Personal Computer Micro-Card Interface Adapter.
.34 PID - Proportional, Integral and Derivative.
.35 RAM - Random Access Memory.
.36 SP - Static Pressure.
.37 ROM - Read Only Memory.
.38 TCU - Terminal Control Unit.
.39 USB - Universal Serial Bus.
.40 UPS - Uninterruptible Power Supply.
.41 VAV - Variable Air Volume.

1.4 DEFINITIONS

.1 Point: may be logical or physical.

.1 Logical points: values calculated by system such as setpoints, totals, counts, derived corrections and may include, but not limited to result of and statements in CDL's.

.2 Physical points: inputs or outputs which have hardware wired to controllers which are measuring physical properties, or providing status conditions of contacts or relays which provide interaction with related equipment (stop, start) and valve or damper actuators.

.2 Point Name: composed of two parts, point identifier and point expansion.

.1 Point identifier: comprised of three descriptors, "area" descriptor, "system" descriptor and "point" descriptor, for which database to provide 25character field for each point identifier. "System" is system that point is located on.

.1 Area descriptor: building or part of building where point is located.

.2 System descriptor: system that point is located on.

.3 Point descriptor: physical or logical point description. For point identifier "area", "system" and "point" will be short forms or acronyms. Database must provide [25] character field for each point identifier.

.2 Point expansion: comprised of three fields, one for each descriptor. Expanded form of shortform or acronym used in "area", "system" and "point" descriptors is placed into appropriate point expansion field. Database must provide 32character field for each point expansion.

.3 Bilingual systems to include additional point identifier expansion fields of equal capacity for each point name for second language.

.1 System to support use of numbers and readable characters including blanks, periods or underscores to enhance user readability for each of the above strings.

.3 Point Object Type: points fall into following object types:

.1 AI (analog input).

.2 AO (analog output).

.3 DI (digital input).

.4 DO (digital output).

.5 Pulse inputs.

.4 Symbols and engineering unit abbreviations utilized in displays: to ANSI/ISA S5.5.

.1 Printouts: to ANSI/IEEE 260.1.

1.5 SYSTEM DESCRIPTION

.1 Refer to control schematics for system architecture.

.2 Work consists of fully operational EMCS, including, but not limited to, following:

.1 Connection to the building controllers.

.2 Control devices as listed in I/O point summary tables.

.3 Data communications equipment necessary to effect EMCS data transmission system.

.4 Field control devices.

.5 Complete operating and maintenance manuals.

.6 Training of personnel.

.7 Acceptance tests, technical support during commissioning, full documentation.

.8 Wiring interface co-ordination of equipment supplied by others.

.9 Miscellaneous work as specified in these sections and as indicated.

.3 Design Requirements:

.1 Design and provide conduit and wiring linking elements of system.

.2 Supply sufficient programmable controllers of types to meet project requirements. Quantity and points contents as reviewed by Consultant prior to installation.

.3 Location of controller as reviewed by Consultant prior to installation.

.4 Metric references: in accordance with CAN/CSA Z234.1.

.4 Language Operating Requirements:

.1 Provide French operator selectable access codes.

.2 Use non-linguistic symbols for displays on graphic terminals wherever possible. Other information to be in French.

.3 Operating system executive: provide primary hardware-to-software interface specified as part of hardware purchase with associated documentation to be in French.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit for review:

.1 Equipment list, systems manufacturers.

.2 List existing field control devices to be re-used included in bid, along with unit price.

.2 Quality Control:

.1 Provide equipment and material from manufacturer's regular production, CSA certified, manufactured to standard quoted plus additional specified requirements.

.2 Where CSA certified equipment is not available submit such equipment to inspection authorities for special inspection and approval before delivery to site.

.3 Submit proof of compliance to specified standards with shop drawings and product.Label or listing of specified organization is acceptable evidence.

.4 For materials whose compliance with organizational standards/codes/specifications is not regulated by organization using its own listing or label as proof of compliance, furnish certificate stating that material complies with applicable referenced standard or specification.

.5 Permits and fees: in accordance with general conditions of contract.

.6 Existing devices intended for re-use: submit test report.

1.7 QUALITY ASSURANCE

.1 Provide record of successful previous installations submitting tender showing experience with similar installations utilizing computer-based systems.

.2 Ensure qualified supervisory personnel continuously direct and monitor Work and attend site meetings.

1.8 EXISTING- CONTROL COMPONENTS

.1 Utilize existing components piping as indicated.

.2 Re-use field control devices that are usable in their original configuration provided that they conform to applicable codes, standards specifications.

.1 Do not modify original design of existing devices without written permission from DCC Representative.

.2 Provide for new, properly designed device where re-usability of components is uncertain.

.3 Inspect and test existing devices intended for re-use within 30 days of award of contract, and prior to installation of new devices.

.1 Furnish test report within 40 days of award of contract listing each component to be re-used and indicating whether it is in good order or requires repair by DCC Representative.

.2 Failure to produce test report will constitute acceptance of existing devices by contractor.

.4 Non-functioning items:

.1 Provide with report specification sheets or written functional requirements to support findings.

.2 The Consultant or DCC Representative will repair or replace existing items judged defective yet deemed necessary for EMCS.

.5 Submit written request for permission to disconnect controls and to obtain equipment downtime before proceeding with Work.

.6 Assume responsibility for controls to be incorporated into EMCS after written receipt of approval from DCC Representative.

.1 Be responsible for items repaired or replaced DCC Representative.

.2 Be responsible for repair costs due to negligence or abuse of equipment.

.7 Remove existing controls not re-used or not required. Place in approved storage for disposition as directed.

PART 2 PRODUCTS

2.1 EQUIPMENT

.1 Products compatible with existing Siemens controller.

2.2 ADAPTORS

.1 Provide adaptors between metric and imperial components.

PART 3 EXECUTION

3.1 MANUFACTURER'S RECOMMENDATIONS

.1 Installation: to manufacturer's recommendations.

3.2 FIELD QUALITY CONTROL

.1 Verification requirements include:

.1 Materials and resources.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section [_____]

1.2 REFERENCE STANDARDS

.1 CSA Group

.1 CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations.

.2 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)

.1 IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.

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 SP1122.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets.

.3 Shop drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province Quebec, 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 of drawings clearances for operation, maintenance, and replacement of operating equipment devices.

.5 If changes are required, notify Departmental Representative, Consultant of these changes before they are made.

.4 Certificates:

.1 Provide CSA certified material & equipment.

.2 Where CSA certified equipment material is not available, submit such equipment material to authority having jurisdiction 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 authority having jurisdiction upon completion of Work to Departmental Representative.

.5 Manufacturer's Field Reports: submit to Consultant manufacturer's written report, within 5 days of review, verifying compliance of Work and electrical system and instrumentation testing, as described in PART 3 - FIELD QUALITY CONTROL.

1.5 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data

.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.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location indoors off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 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 labels, nameplates for control items in French & English.

.4 Use one nameplate for both languages.

2.2 MATERIALS AND EQUIPMENT

.1 Provide material equipment in accordance with Section 01 61 00- Common Product Requirements.

.2 Equipment, material to be CSA certified. Where CSA certified equipment material are not available, obtain special approval from authority having jurisdiction before delivery to site and submit such approval as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.3 Factory assemble control panels and component assemblies.

2.3 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

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

2.4 WARNING SIGNS

.1 Warning Signs: in accordance with requirements of Ministerial Representative.

2.5 WIRING TERMINATIONS

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

2.6 EQUIPMENT IDENTIFICATION

.1 Identify electrical equipment with nameplates as follows:

.1 Nameplates: lamicoid 3mm thick plastic engraving sheet, matt black finish 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 to be approved by Departmental Representative prior to manufacture.

.4 Allow for minimum of twenty-five (25) letters per nameplate.

.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. [_____] Departmental Representative.

.7 Disconnects, starters and contactors: indicate equipment being controlled and voltage.

.8 Terminal cabinets and pull boxes: indicate system and voltage.

.9 Transformers: indicate capacity, primary and secondary voltages.

2.7 WIRING IDENTIFICATION

.1 Identify wiring with permanent indelible identifying markings, 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.

2.8 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 15 m intervals.

.3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.

Type	Prime	Auxiliary
up to 250 V	Yellow	
up to 600 V	Yellow	Green
up to 5 kV	Yellow	Blue
up to 15 kV	Yellow	Red
Telephone	Green	
Other Communication Systems	Green	Blue
Fire Alarm	Red	
Emergency Voice	Red	Blue
Other Security Systems	Red	Yellow

2.9 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 "equipment green" finish.

.2 Paint indoor switchgear and distribution enclosures light gray.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for [_____]

.1 Visually inspect substrate in presence of Departmental Representative and Consultant.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSTALLATION

.1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.

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

3.3 NAMEPLATES AND LABELS

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

3.4 CONDUIT AND CABLE INSTALLATION

.1 Install conduit and sleeves prior to pouring of concrete.

.1 Sleeves through concrete: schedule 40 galvanised 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.

3.5 LOCATION OF OUTLETS

.1 Locate outlets in accordance with Section 26 05 32- Outlet Boxes, Conduit Boxes and Fittings.

.2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.

.3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.

.4 Locate light switches on latch side of doors.

.1 Locate disconnect devices in mechanical and elevator machine rooms on latch side of floor.

3.6 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: 1400 mm.

.2 Wall receptacles:

.1 General: 300 mm.

.2 Above top of continuous baseboard heater: 200 mm.

.3 Above top of counters or counter splash backs: 175 mm.

.4 In mechanical rooms: 1400 mm.

.3 Panelboards: as required by Code or as indicated.

.4 Telephone and interphone outlets: 300 mm.

.5 Wall mounted telephone and interphone outlets: 1500 mm.

.6 Fire alarm stations: 1500 mm.

.7 Fire alarm bells: 2100 mm.

.8 Television outlets: 300 mm.

.9 Wall mounted speakers: 2100 mm.

.10 Clocks: 2100 mm.

.11 Door bell pushbuttons: 1500 mm.

3.7 CO-ORDINATION OF PROTECTIVE DEVICES

.1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.8 FIELD QUALITY CONTROL

.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 - ACTION AND INFORMATIONAL 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 in accordance with Section 01 45 00- Quality Control.

.1 Power distribution system including phasing, voltage, grounding and load balancing.

.2 Circuits originating from branch distribution panels.

.3 Lighting and its control.

.4 Motors, heaters and associated control equipment including sequenced operation of systems where applicable.

.5 Systems: fire alarm, communications.

.6 Insulation resistance testing:

.1 Measure the insulation value of circuits, cables of existing feeder arteries using a megohmmeter.

.2 Check resistance to ground before energizing.

.3 Carry out tests in presence of Departmental Representative.

.4 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

.5 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 - ACTION AND INFORMATIONAL 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.

3.9 SYSTEM STARTUP

.1 Instruct Departmental Representative, 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.

3.10 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.1 Leave Work area clean at end of each day.

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

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CAN/CSA-C22.2 No.18-98(R2003), Outlet Boxes, Conduit Boxes and Fittings.

.2 CAN/CSA-C22.2 No.65-03(R2008), Wire Connectors (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)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for wire and box connectors and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for [wire and box connectors] for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground, in dry location indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse packaging materials.

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 TECK cable, flexible conduit, as required to: CAN/CSA-C22.2 No.18.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wire and box connectors installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant & Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSTALLATION

.1 Remove insulation carefully from ends of conductors, cables and:

.1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.

.2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No.65.

.3 Install fixture type connectors and tighten to CAN/CSA-C22.2 No. 65. Replace insulating cap.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.1 Leave Work area clean at end of each day.

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

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 REFERENCE STANDARDS

.1 [_____]

1.3 PRODUCT DATA

.1 Provide product data in accordance with Section 01 33 00- Submittal Procedures.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Packaging Waste Management: remove for reuse 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, RWU90 XLPE.

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 Inner jacket: polyvinyl chloride material.

.4 Armour: aluminum.

.5 Overall covering: thermoplastic polyvinyl chloride, compliant to applicable Building Code classification for this project.

.6 Fastenings:

- .1 One hole aluminum straps to secure surface cables 50 mm and smaller. Two-hole straps for cables larger than 50 mm.
- .2 Channel type supports for two or more cables at
- .3 Threaded rods: 6 mm diameter to support suspended channels.

.7 Connectors:

- .1 Watertight, approved for TECK cable.

2.3 ARMOURED CABLES

.1 Conductors: insulated, copper, size as indicated.

.2 Type: AC90.

.3 Armour: interlocking type fabricated from aluminum strip.

.4 Connectors: anti short connectors.

2.4 CONTROL CABLES

.1 Type: LVT: soft annealed copper conductors, sized as indicated:

.1 Insulation: thermoplastic.

.2 Sheath: thermoplastic jacket, and armour of closely wound aluminum wire.

.2 Type: low energy 300 V control cable: stranded annealed copper conductors sized as indicated LVT: 2 soft annealed copper conductors, sized as indicated:

2.5 NON-METALLIC SHEATHED CABLES

.1 This type of cable is not allowed.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

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

.2 Perform tests before energizing electrical system.

3.2 GENERAL CABLE INSTALLATION

.1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 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 Branch circuit wiring for surge suppression receptacles and permanently wired computer and electronic equipment to be 2-wire circuits only, i.e. common neutrals not permitted.

.7 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 Fastenings and Conduit Fittings.

.2 In underground ducts in accordance with Section 33.

.3 In surface and lighting fixture raceways in accordance with Section 26.

3.4 INSTALLATION OF TECK90 CABLE (0 -1000 V)

.1 Group cables wherever possible on channels.

.2 Install cable concealed, securely supported by straps, staples hangers.

3.5 INSTALLATION OF ARMOURED CABLES

.1 Group cables wherever possible on channels.

3.6 INSTALLATION OF CONTROL CABLES

.1 Install control cables in conduit.

.2 Ground control cable shield.

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for hangers and supports and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements, with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors in dry location, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect hangers and supports from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse packaging materials.

PART 2 PRODUCTS

2.1 SUPPORT CHANNELS

.1 U shape, size 41 x 41 mm, 2.5 mm thick, or as indicated.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for hangers and supports installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSTALLATION

.1 Secure equipment to solid masonry, tile and plaster surfaces with lead anchors.

.2 Secure equipment to poured concrete with expandable inserts.

.3 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.

.4 Secure surface mounted equipment with twist clip fasteners to inverted T bar ceilings. Ensure that T bars are adequately supported to carry weight of equipment specified before installation.

.5 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.

.6 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.

.7 Suspended support systems.

.1 Support individual cable or conduit runs with 6 mm diameter threaded rods and spring clips.

.2 Support 2 or more cables or conduits on channels supported by 6 mm diameter threaded rod hangers where direct fastening to building construction is impractical.

.8 For surface mounting of two or more conduits use channels at 1200 mm.

.9 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.

.10 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.

.11 Do not use wire lashing or perforated strap to support or secure raceways or cables.

.12 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of Consultant.

.13 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CSA C22.1-06, Canadian Electrical Code, Part 1, 20th Edition.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Provide shop drawings: in accordance with Section 01 33 00- Submittal Procedures.

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

.1 Separate waste materials for 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 covers.

2.3 CABINETS

.1 Construction: welded aluminum, hinged door, handle, lock 2 keys, latch and catch

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, PULL BOXES AND CABINETS INSTALLATION

.1 Install pull boxes in inconspicuous but accessible locations.

.2 Mount cabinets with top not higher than 2 m above finished floor except where indicated otherwise.

.3 Install terminal block as indicated in Type T cabinets.

.4 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 voltage and phase, system name or as indicated.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CSA C22.1-06, Canadian Electrical Code, Part 1, 20th Edition.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit samples for floor box in accordance with Section 01 33 00 - Submittal Procedures.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Waste Management and Disposal:

.1 Separate waste materials for recycling.

PART 2 PRODUCTS

2.1 OUTLET AND CONDUIT BOXES GENERAL

.1 Size boxes in accordance with CSA C22.1.

.2 102 mm square or larger outlet boxes as required.

.3 Gang boxes where wiring devices are grouped.

.4 Blank cover plates for boxes without wiring devices.

.5 347 V outlet boxes for 347 V switching devices.

.6 Combination boxes with barriers where outlets for more than one system are grouped.

2.2 GALVANIZED STEEL OUTLET BOXES

.1 One-piece electro-galvanized construction.

.2 Single and multi gang flush device boxes for flush installation, minimum size 76 x 50 x 38 mm or as indicated. 102 mm square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.

.3 Utility boxes for outlets connected to surface-mounted EMT conduit, minimum size 102 x 54 x 48 mm.

.4 102 mm square or octagonal outlet boxes for lighting fixture outlets.

.5 Extension and plaster rings for flush mounting devices in finished [tile] [plaster] walls.

2.3 MASONRY BOXES

.1 Electro-galvanized steel masonry and multi, single gang boxes for devices flush mounted in exposed block walls.

2.4 CONCRETE BOXES

.1 Electro-galvanized sheet steel concrete type boxes for flush mount in concrete with matching extension and plaster rings as required.

2.5 CONDUIT BOXES

.1 Cast FS, FD aluminum boxes with factory-threaded hubs and mounting feet for surface wiring of devices.

2.6 FITTINGS - GENERAL

.1 Bushing and connectors with nylon insulated throats.

.2 Knock-out fillers to prevent entry of debris.

.3 Conduit outlet bodies for conduit up to 35 mm and pull boxes for larger conduits.

.4 Double locknuts and insulated bushings on sheet metal boxes.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Support boxes independently of connecting conduits.

.2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.

.3 For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm of opening.

.4 Floor openings for recessed boxes shall be made by a cabinetmaker under the guidance of the general contractor.

.5 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Do not install reducing washers.

.6 Vacuum clean interior of outlet boxes before installation of wiring devices.

.7 Identify systems for outlet boxes as required.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Product data: submit manufacturer's printed product literature, specifications and datasheets.

.1 Submit cable manufacturing data.

.3 Quality assurance submittals:

.1 Test reports: submit certified test reports.

.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.3 Instructions: submit manufacturer's installation instructions.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling.

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.

2.2 CONDUITS

.1 Rigid metal conduit: to CSA C22.2 No. 45, hot dipped galvanized steel threaded.

.2 Epoxy coated conduit: to CSA C22.2 No. 45, with zinc coating and corrosion resistant epoxy finish inside and outside.

.3 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings.

.4 Rigid PVC conduit: to CSA C22.2 No. 211.2.

.5 Flexible metal conduit: to CSA C22.2 No. 56, liquid-tight flexible metal, aluminum.

2.3 CONDUIT FASTENINGS

.1 One hole steel straps to secure surface conduits NPS 2, 50 mm and smaller.

.1 Two hole steel straps for conduits larger than NPS 2, 50 mm.

.2 Beam clamps to secure conduits to exposed steel work.

.3 Channel type supports for two or more conduits at 1500 mm.

.4 Threaded rods, [6] mm diameter, to support suspended channels.

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, NPS 1 and larger conduits.

.3 Watertight connectors and couplings for EMT.

.1 Set-screws are not acceptable.

2.5 EXPANSION FITTINGS FOR RIGID CONDUIT

.1 Weatherproof expansion fittings with internal bonding assembly suitable for 100 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, and where indicated on drawings.

.3 Use electrical metallic tubing (EMT) above 2.4 m not subject to mechanical injury except in cast concrete.

.4 Use rigid PVC conduit underground.

.5 Use liquid tight flexible metal conduit for connection to motors or vibrating equipment in damp, wet or corrosive locations.

.6 Use explosion proof flexible connection for connection to explosion proof motors.

.7 Install conduit sealing fittings in hazardous areas.

.1 Fill with compound.

.8 Minimum conduit size for lighting and power circuits: 19 mm.

.9 Bend conduit cold:

.1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.

.10 Mechanically bend steel conduit over 19 mm diameter.

.11 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.

.12 Install fish cord in empty conduits.

.13 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 surface 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 CONDUITS IN CAST-IN-PLACE CONCRETE

.1 Conduits in cast-in-place concrete are not permitted.

3.6 CONDUITS IN CAST-IN-PLACE SLABS ON GRADE

.1 Conduits in cast-in-place slabs on grade are not permitted.

3.7 CONDUITS UNDERGROUND

.1 Slope conduits to provide drainage.

.2 Waterproof joints (PVC excepted) with heavy coat of bituminous paint.

3.8 CLEANING

.1 Proceed in accordance with Section 01 74 11- Cleaning.

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

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CSA C22.2 No.29-11, Panelboards and Enclosed Panelboards.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for panelboards and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.

.2 Include on drawings:

.1 Electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for panelboards for incorporation into O&M manual.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements, with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse of packaging materials.

PART 2 PRODUCTS

2.1 PANELBOARDS

.1 Panelboards: to CSA C22.2 No.29 and product of one manufacturer.

.1 Install circuit breakers in panelboards before shipment.

.2 In addition to CSA requirements manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.

.2 250 V panelboards: bus and breakers rated for minimum10 kA or according to the existing.

.3 600 V panelboards: bus and breakers rated for minimum 35 kA or according to the existing.

.4 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.

.5 Panelboards: mains, number of circuits, and number and size of branch circuit breakers as indicated.

.6 Minimum of 2 flush locks for each panel board.

.7 Two keys for each panelboard and key panelboards alike.

.8 Copper bus with neutral of same ampere rating of mains.

.9 Mains: suitable for bolt-on breakers.

.10 Trim with concealed front bolts and hinges (door in door option).

.11 Trim and door finish: as per colour schedule, baked enamel, air dried enamel.

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.

.3 Main breaker: separately mounted on top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker.

.4 Lock-on devices for receptacles, clock outlet, fire alarm, emergency, door supervisory, intercom, stairway, exit and night light circuits.

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

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for panelboards installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSTALLATION

.1 Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.

.2 Install surface mounted panelboards on plywood backboards in accordance with Section 06 10 00- Rough Carpentry. Where practical, group panelboards on common backboard.

.3 Mount panelboards to height specified in Section 26 05 00- Common Work Results for Electrical or as indicated.

.4 Connect loads to circuits.

.5 Connect neutral conductors to common neutral bus with respective neutral identified.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.1 Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials for recycling.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by panelboards installation.

END OF SECTION

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PART 1 GENERAL

1.1 SHOP DRAWINGS

.1 Indicate on drawings:

.1 Outline dimensions.

.2 Configuration of identified compartments.

.3 Floor anchoring method and dimensioned foundation template.

.4 Cable entry and exit locations.

.5 Dimensioned position and size of busbars and details of provision for future extension.

.6 Schematic and wiring diagrams.

PART 2 PRODUCTS

2.1 SUPPLY CHARACTERISTICS

.1 600 V connected, 3 phases, wye 60 Hz.

2.2 GENERAL DESCRIPTION

.1 Compartmentalized vertical sections with common power busbars.

.2 Floor mounting, free standing, enclosed dead front.

.3 Indoor CSA 1 enclosure.

.4 Unit for combinate starter and disconnect as indicated.

.5 Front mounting.

.6 Class I, Type B.

.7 Existing MCC is an GE model no: CR-2000.

2.3 VERTICAL SECTION CONSTRUCTION

.1 Independent vertical sections fabricated from rolled flat steel sheets bolted together to form rigid, completely enclosed assembly.

.2 Each vertical section divided into compartment units, as indicated.

.3 Each unit to have complete top and bottom steel plate for isolation between units.

.4 Horizontal wireways, equipped with cable supports, across top and bottom, extending full width of motor control centre, isolated from busbars by steel barriers.

.5 Vertical wireways c/w doors for load and control conductors extending full height of vertical sections, and equipped with cable tie supports. Installation wiring to units accessible with doors open and units in place.

.6 Openings, with removable cover plates, in side of vertical sections for horizontal wiring between sections.

.7 Incoming cables to enter at with terminals as indicated on top.

.8 Provision for outgoing cables to exit via top or bottom with terminals.

.9 Removable lifting means.

.10 Provision for future extension of both ends of motor control centre including busbars without need for further drilling, cutting or preparation in field.

.11 Divide assembly for shipment to site, as indicated complete with hardware and instructions for re-assembly.

2.4 SILLS

.1 Continuous.

2.5 BUSBARS

.1 Main horizontal and branch vertical, three phase high conductivity tin, plated, copper, aluminum busbars in separate compartment bare self-cooled, extending entire width and height of motor control centre, supported on insulators and rated:

.1 Main horizontal busbars: as indicated.

.2 Branch vertical busbars: as indicated.

.2 Branch vertical busbars for distribution of power to units in vertical sections.

.3 No other cables, wires, equipment in main and branch busbar compartments.

.4 Brace buswork to withstand effects of short-circuit current as indicated.

.5 Bus supports: with high dielectric strength, low moisture absorption, high impact material and long creepage surface designed to discourage collection of dust.

2.6 GROUND BUS

.1 Copper ground bus extending entire width of motor control centre.

2.7 STARTER UNIT COMPARTMENTS

.1 Units EEMAC size 5 and smaller, circuit breaker units 225A and smaller, plug-in type with self-disconnect. Guide rail supports for units to ensure that stabs make positive contact with vertical bus. Provision for units to be installed or removed, off load, while buses energized.

.2 Unit mounting:

.1 Engaged position - unit stabbed into vertical bus.

.2 Withdrawn position - unit isolated from vertical bus but supported by structure. Terminal block accessible for electrical testing of starter.

.3 Provision for positive latching in either engaged or withdrawn position and padlocking in withdrawn position.

.4 Stab-on connectors free floating tin plated clips, self-aligning, backed up with steel springs.

.3 External operating handle of circuit switch interlocked with door to prevent door opening with switch in "on" position. Provision for 3 padlocks to lock operating handle in "off" position and lock door closed.

.4 Hinge unit doors on same side.

.5 Overload relays manually reset from front with door closed.

.6 Selectors and indicating lights mounted on door front.

.7 Devices and components by one manufacturer to facilitate maintenance.

2.8 WIRING IDENTIFICATION

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

2.9 EQUIPMENT IDENTIFICATION

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

.1 Motor control centre main nameplate: size No. 7.

.2 Individual compartment nameplates: size No. 5, engraved as indicated.

2.10 FINISHES

.1 Apply finishes in accordance with Section 26 05 00- Common Work Results for Electrical.

.2 Paint motor control centre exterior light grey and interiors white.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Set and secure motor control centre in place on channel bases, rigid, plumb and square to building floor and wall.

.2 Make field power and control connections as indicated.

.3 Ensure correct overload heater elements are installed.

3.2 FIELD QUALITY CONTROL

.1 Ensure moving and working parts are lubricated where required.

.2 Operate starters in sequence to prove satisfactory performance of motor control centre.

.3 Ensure that overload rating are approximated for the associated motor.

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 common work results for electrical

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CSA C22.2 No.42-10, General Use Receptacles, Attachment Plugs and Similar Devices.

.2 CSA C22.2 No.55-FM1986(R2008), Special Use Switches.

.3 CSA C22.2 No.111-10, General-Use Snap Switches (Bi-national standard, with UL 20).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for wiring devices and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for wiring devices for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location, indoors, off the ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect wiring devices from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 SWITCHES

.1 15 A, 120 V, single pole, three-way switches to:CSA C22.2 No.111 and CSA C22.2 No.55 .

.2 Manually-operated general-purpose AC switches with following features:

.1 Terminal holes approved for No. 10 AWG wire.

.2 Silver alloy contacts.

.3 Urea or melamine moulding for parts subject to carbon tracking.

.4 Suitable for back and side wiring.

.5 Ivory toggle.

.3 Toggle operated fully rated for tungsten filament and fluorescent lamps, and up to 80% of rated capacity in the case of heating loads.

.4 Switches of one manufacturer throughout project.

2.2 RECEPTACLES

.1 Duplex receptacles, CSA type 5-15 R, 125 V, 15 A, U ground, to: CSA C22.2 No.42 with following features:

.1 Ivory urea moulded housing.

.2 Suitable for No. 10 AWG for back and side wiring.

.3 Break-off links for use as split receptacles.

.4 Eight (8) back wired entrances, four side wiring screws.

.5 Triple wipe contacts and rivetted grounding contacts.

.2 Single receptacles CSA type 5-15 R, 125 V, 15 A, U ground with following features:

.1 Ivory urea moulded housing.

.2 Suitable for No. 10 AWG for back and side wiring.

.3 Four back wired entrances, 2 side wiring screws.

.3 Other receptacles with ampacity and voltage as indicated.

.4 Receptacles of one manufacturer throughout project.

2.3 COVER PLATES

.1 Cover plates for wiring devices to: CSA C22.2 No.42.1

.2 Sheet steel utility box cover for wiring devices installed in surface-mounted utility boxes.

.3 ivory cover plates, thickness 2.5 mm Stainless steel, vertically brushed, 1 mm thick cover plates for wiring devices mounted in flush-mounted outlet box.

.4 Cast cover plates for wiring devices mounted in surface-mounted FS or FD type conduit boxes.

.5 Weatherproof double lift spring-loaded cast aluminum cover plates, complete with gaskets for duplex receptacles as indicated.

.6 Weatherproof spring-loaded cast aluminum cover plates complete with gaskets for single receptacles or switches.

2.4 SOURCE QUALITY CONTROL

.1 Cover plates from one manufacturer throughout project.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wiring devices installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSTALLATION

.1 Switches:

.1 Install single throw switches with handle in "UP" position when switch closed.

.2 Install switches in gang type outlet box when more than one switch is required in one location.

.3 Mount toggle switches at height as indicated.

.2 Receptacles:

.1 Install receptacles in gang type outlet box when more than one receptacle is required in one location.

.2 Mount receptacles at height as indicated.

.3 Where split receptacle has one portion switched, mount vertically and switch upper portion.

.4 Install GFI type receptacles as indicated.

.3 Cover plates:

.1 Install suitable common cover plates where wiring devices are grouped.

.2 Do not use cover plates meant for flush outlet boxes on surface-mounted boxes.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.1 Leave Work area clean at end of each day.

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

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Protect stainless steel cover plate finish with paper or plastic film until painting and other work is finished.

.3 Repair damage to adjacent materials caused by wiring device installation.

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 common work results for electrical

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CSA C22.2 No. 5-[09] , Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, and NMX-J-266-ANCE-2010).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for circuit breakers and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Certificates:

.1 Prior to installation of circuit breakers in either new or existing installation, Contractor must submit three 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.

.1 Production certificate of origin must be submitted Departmental Representative for approval.

.2 Delay in submitting production of certificate of origin will not justify any extension of contract and additional compensation.

.3 Any work of manufacturing, assembly or installation to begin only after acceptance of production certificate of origin by Departmental Representative. Unless complying with this requirement, Departmental Representative reserves the right to mandate manufacturer listed on circuit breakers to authenticate new circuit breakers under the contract, and to Contractor's expense.

.4 Production certificate of origin must contain:

.1 Manufacturer's name and address and person responsible for authentication. Person responsible must sign and date certificate.

.2 Licensed dealer's name and address and person of distributor responsible for Contractor's account.

.3 Contractor's name and address and person responsible for project.

.4 Local manufacturer's representative name and address. Local manufacturer's representative must sign and date certificate.

.5 Name and address of building where circuit breakers will be installed:

.1 Project title: [_____]

.2 End user's reference number: [_____]

.3 List of circuit breakers: [_____]

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.

.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 in dry location indoors off ground 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.

.4 Packaging Waste Management: remove packaging materials for recycling.

PART 2 PRODUCTS

2.1 BREAKERS GENERAL

.1 Circuit breakers, ground-fault circuit-interrupters: 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 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.

.5 Circuit breakers with must have a breaking capacity of at least 10 kA sym at 240V and 25 kA sym. at 600V.

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.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Install circuit breakers as indicated.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.1 Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials for recycling.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

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PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 Common work results for electrical

1.2 REFERENCE STANDARDS

.1 CSA Group

.1 CAN/CSA-C22.2 No.4-04(R2009), Enclosed and Dead-Front Switches (Tri-National Standard, with ANCE NMX-J-162-2004 and UL 98).

.2 CSA C22.2 No.39-13, Fuseholder Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for disconnect switches - fused and non-fused and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors, off the ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect disconnect switches - fused and non-fused from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 DISCONNECT SWITCHES

.1 Fusible or non-fusible switches, industrial grade "ultra-rugged", in CSA 3 enclosure, rated to CAN / CSA-C22.2 number 4.

.2 Provision for padlocking in On or Off switch position by 3 locks.

.3 Mechanically interlocked door to prevent opening when handle in ON position.

.4 Fuses: size as indicated.

.5 Fuseholders: to CSA C22.2 No.39 relocatable and suitable without adaptors, for type and size of fuse indicated.

.6 Quick-make, quick-break action.

.7 ON-OFF switch position indication on switch enclosure cover.

2.2 EQUIPMENT IDENTIFICATION

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

.2 Indicate name of load controlled on size 4 nameplate.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for disconnect switches - fused and non-fused installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied - Consultant.

3.2 INSTALLATION

.1 Install disconnect switches complete with fuses if applicable.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.1 Leave Work area clean at end of each day.

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

END OF SECTION

PART 1 GENERAL

1.1 SHOP DRAWINGS

.1 Provide shop drawings for each type of starter to indicate:

- .1 Mounting method and dimensions.
- .2 Starter size and type.
- .3 Layout and components.
- .4 Enclosure types.
- .5 Wiring diagram.
- .6 Interconnection diagrams.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Starters: to IEC 947-4 with AC4 utilization category.

2.2 FULL VOLTAGE MAGNETIC STARTERS

.1 Magnetic and combination magnetic starters of size, type, rating and enclosure type as indicated with components as follows:

- .1 Contactor solenoid operated, rapid action type.
- .2 Motor overload protective device in each phase, manually reset from outside enclosure.
- .3 Terminals blocs for feeder and control wires.
- .4 Wiring and schematic diagram inside starter enclosure in visible location.
- .5 Identify each wire and terminal for external connections, within starter, with permanent number marking identical to diagram.

.2 Combination type starters to include motor circuit interrupter with operating lever on outside of enclosure to control motor circuit interrupter, and provision for:

- .1 Locking in "OFF" position with up to 3 padlocks.
- .2 Independent locking of enclosure door.
- .3 Provision for preventing switching to "ON" position while enclosure door open.

.3 Accessories:

- .1 ON, OFF, Auto Selector switches: heavy duty labelled as indicated.
- .2 Indicating lights: heavy duty type and Colour: red for stop indication, green for running indication and yellow for overload indication.
- .3 2-N/O and 2-N/C spare auxiliary contacts unless otherwise indicated.

2.3 CONTROL TRANSFORMER

.1 Single phase, dry type, control transformer with primary voltage as indicated and [120] V secondary, complete with secondary fuse, installed in with starter as indicated.

.2 Size control transformer for control circuit load plus 20% spare capacity.

2.4 FINISHES

.1 Apply finishes to enclosure in accordance with general specifications.

2.5 EQUIPMENT IDENTIFICATION

.1 Starter designation label, white plate, black letters, size 1, engraved as indicated.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Install starters and control devices and wiring in accordance with manufacturer's instructions.

.2 Ensure correct fuses installed and confirm motor nameplate and adjust overload device to suit.

3.2 FIELD QUALITY CONTROL

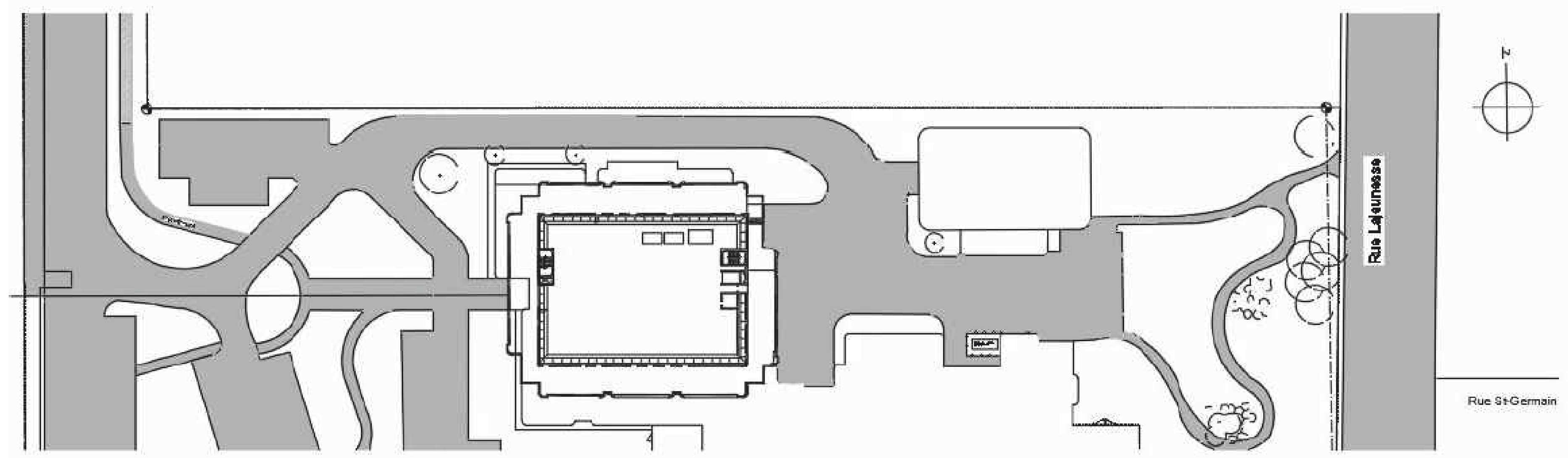
.1 Perform starting and stopping sequences of contactors and relays.

.2 Check that sequence controls, interlocking with other separate related starters, equipment, control devices, operate as indicated.

END OF SECTION

REMPLACEMENT DE TOURS D'EAU CENTRE DE RECHERCHE ET DE DÉVELOPPEMENT ST-JEAN-SUR-RICHELIEU

REPLACEMENT OF COOLING TOWER FOR RESEARCH AND DEVELOPMENT CENTER ST-JEAN -SUR-RICHELIEU



PLAN SITE / SITE MAP

ÉCHELLE/SCALE: AUCUNE / NTS

LISTE DES DESSINS / *DRAWINGS LIST*

S-000	PAGE FRONTISPICE / *FRONTISPICE PAGE*
S-001	NOTES GÉNÉRALES / *GENERAL NOTES*
S-101	VUE EN PLAN - NIVEAU "3" / *PLAN VIEW - LEVEL "3"*
S-201	COUPES & DÉTAILS / *SECTIONS & DETAILS*

THESE DOCUMENTS SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

CES DOCUMENTS NE DOIVENT PAS ÊTRE UTILISÉS À DES FINS DE CONSTRUCTION (OU DE FABRICATION).

9160, BOULEVARD LEDUC, BUREAU 210
BROSSARD (QUÉBEC) CANADA J4Y 0E3
TÉL. : 450 679-7220 | TÉLÉC. : 450 670-9076 | WWW.WSPGROUP.COM

CONSULTANT - SOUS-CONSULTANT / CONSULTANT - SUB-CONSULTANT:

SCEAU / SEAL:

CLIENT / CLIENT:

AGRICULTURE ET AGROALIMENTAIRE CANADA (AAC)

RÉF. CLIENT / CLIENT REF. #: 532971

PROJET / PROJECT:

Remplacement de tours d'eau
Centre de recherche et de développement
de St-Jean-sur-Richelieu/
Replacement of cooling tower for Research
and Development Center
St-Jean -sur-Richelieu

PLAN CLÉ / KEY PLAN:

ÉMISSION - RÉVISION / ISSUED FOR - REVISION:

ÉM./IS.	RV./RV.	DATE / DATE	DESCRIPTION / DESCRIPTION
A		2019-08-20	ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER

NO PROJET / PROJECT NO: 191-08126-00

DATE / DATE: 2019-07-16

ÉCHELLE ORIGINALE / ORIGINAL SCALE: INDIQUÉE

PRÉPARÉ PAR / PREPARE BY: SIMONA DAVID, ing.

MODIFIÉ PAR / MODIFIED BY: --

ASSISTÉ DE / ASSISTED BY: ISABELLE LAUZON, ing.

DESSINÉ PAR / DRAWN BY: G.P.

SI CETTE BARRE NE MESURE PAS 25 mm, AJUSTER VOTRE ÉCHELLE DE TRAÇAGE.

IF THIS BAR IS NOT 25 mm LONG, ADJUST YOUR PLOTTING SCALE.

25 mm

DISCIPLINE / DISCIPLINE: **STRUCTURE / STRUCTURE**

TITRE / TITLE:

PAGE FRONTISPICE / FRONTISPICE PAGE

NUMÉRO DU FEUILLET / SHEET NUMBER: **S-000**

FEUILLET # / SHEET #: 1 DE / OF 4

ÉMISSION / ISSUE: ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER

RV./RV. #: 0

EN DATE DU / DATE OF: 2019-08-20

DIVISION 01 00 00- EXIGENCES GÉNÉRALES / GENERAL REQUIREMENTS

GÉNÉRALITÉS / GENERAL

1. LE DÉMANTÈLEMENT ET L'INSTALLATION DES TOURS D'EAU DEVRA SE FAIRE EN SÉQUENCE, I.E. QU'UNE TOUR D'EAU DEVRA ÊTRE PLEINEMENT FONCTIONNELLE AVANT DE NE POUVOIR COMMENCER LES TRAVAUX SUR UNE AUTRE. / THE DISMANTLING AND INSTALLATION OF THE COOLING TOWER MUST BE DONE IN SEQUENCE I.E. ONE COOLING TOWER MUST BE FULLY FUNCTIONAL BEFORE BEGINNING WORK ON THE OTHER COOLING TOWER.

2. LA TOUR D'EAU CR-3 DOIT ÊTRE DÉMOLI ET INSTALLER EN PREMIER. UNE FOIS, APRÈS LA MISE EN MARCHE DE LA TOUR D'EAU CR-3 LES TRAVAUX ET L'INSTALLATION DE LA TOUR D'EAU CR-2 PEUVENT DÉBUTER. / FIRST THE COOLING TOWER MUST BE DEMOLISHED AND INSTALLED. ONCE, AFTER THE START UP OF THE COOLING TOWER CR-3, THE WORK TO DISMANTLE AND INSTALL THE COOLING TOWER CR-2 CAN BEGIN.

3. L'ENTREPRENEUR DOIT EXÉCUTER TOUS LES TRAVAUX CONFORMÉMENT AUX EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC 2010 - CHAPITRE 1, BÂTIMENT, ET CODE NATIONAL DU BÂTIMENT - CANADA 2010. / STRUCTURAL DESIGN IS IN ACCORDANCE WITH THE 2010 QUEBEC CONSTRUCTION CODE(QCC) AND NATIONAL BUILDING CODE OF CANADA 2010.
   CATÉGORIE DE RISQUE DU BÂTIMENT : NORMAL / BUILDING RISK CATEGORY: NORMAL

4. L'ENTREPRENEUR DOIT CONSIDÉRER QUE LES RÉFÉRENCES AUX CODES ET NORMES SONT DE LA PLUS RÉCENTE ÉDITION EN VIGUEUR. / ALL REFERENCED STANDARDS SHALL BE THE CURRENT EDITION UNLESS DIFFERENT EDITION IS REFERENCED BY THE APPLICABLE BUILDING CODE NOTED ABOVE.

5. AVANT LE DÉBUT DES TRAVAUX, L'ENTREPRENEUR DOIT, SOUS SA SEULE RESPONSABILITÉ, VÉRIFIER LES ÉLÉVATIONS ET LES DIMENSIONS SE RAPPORTANT À LA STRUCTURE EXISTANTE (S'IL Y A LIEU), LES CONDITIONS D'ACCÈS, L'ENCOMBREMENT DES LIEUX, LES EXIGENCES DU PROPRIÉTAIRE, ETC. AVISER L'INGÉNIEUR DE TOUTES DIMENSIONS OU ÉLÉVATIONS NON CONCORDANTES AVEC LES PLANS DE STRUCTURE OU DE TOUTES AUTRES ERREURS OU OMISSIONS. / PRIOR TO CONSTRUCTION, REVIEW STRUCTURAL DRAWINGS IN CONJUNCTION WITH DRAWINGS PROVIDED BY ALL OTHER CONSULTANTS, AND WITH EXISTING CONDITIONS. REPORT DISCREPANCIES TO THE CONSULTANT BEFORE PROCEEDING WITH THE WORK.

6. NE PAS MESURER LES PLANS À L'ÉCHELLE, SEULES LES COTES INDIQUÉES SONT VALABLES. / DO NOT SCALE THESE DRAWINGS.

7. POUR LA CONSTRUCTION, L'ENTREPRENEUR DOIT UTILISER LES PLANS ÉMIS POUR CONSTRUCTION. / USE THESE DRAWINGS ONLY FOR THE PURPOSE IDENTIFIED IN THE REVISIONS COLUMN. DO NOT CONSTRUCT FROM THESE DRAWINGS UNLESS MARKED "ISSUED FOR CONSTRUCTION".

8. EN TOUT TEMPS LORS DE LA CONSTRUCTION, L'ENTREPRENEUR NE DOIT IMPOSER À AUCUNE PARTIE DE L'OUVRAGE, UNE CHARGE QUI POURRAIT COMPROMETTRE SA SÉCURITÉ OU LUI CAUSER UNE DÉFORMATION PERMANENTE. / MAKE ADEQUATE PROVISIONS FOR ALL LOADS ACTING ON THE STRUCTURE DURING ERECTION. PROVIDE TEMPORARY SHORING AND BRACING TO KEEP THE STRUCTURE PLUMB AND IN TRUE ALIGNMENT DURING CONSTRUCTION.

9. L'ENTREPRENEUR ET SES SOUS-TRAITANTS DOIVENT CONSIDÉRER QUE LES TRAVAUX DÉPENDENT DES CONDITIONS DE CHANTIER. ILS SONT TENUS DE COMPLÉTER LES OUVRAGES SELON LES RÈGLES DE L'ART DE LEUR MÉTIER. / THE CONTRACTOR AND ITS SUBCONTRACTORS MUST CONSIDER THAT THE WORK IS DEPENDENT ON SITE CONDITIONS. THEY ARE REQUIRED TO COMPLETE THE WORKS ACCORDING TO THE RULES OF THE ART OF THEIR TRADE.

10. LES PLANS DE STRUCTURE SONT COMPLÉMENTAIRES ET DOIVENT SE LIRE CONJOINTEMENT AVEC LES PLANS DES AUTRES PROFESSIONNELS. / THE STRUCTURE PLANS ARE COMPLEMENTARY AND MUST READ IN CONJUNCTION WITH THE PLANS OF OTHER PROFESSIONALS.

11. TOUS LES CHANGEMENTS DEMANDÉS PAR L'ENTREPRENEUR, NÉCESSITANT DES MODIFICATIONS À LA STRUCTURE (ÉQUIVALENCE, CHANGEMENT D'UNITÉ MÉCANIQUE, MODIFICATION AUX DIMENSIONS DES OUVERTURES, ETC.), SONT AUX FRAIS DE L'ENTREPRENEUR. LE TEMPS ALLOUÉ PAR L'INGÉNIEUR POUR L'ÉTUDE, LES CALCULS ET L'ÉMISSION DE CROQUIS DÛ À CES CHANGEMENTS, SONT AUSSI AUX FRAIS DE L'ENTREPRENEUR SUR PRÉAVIS. EFFECTUER LES CHANGEMENTS APRÈS L'ACCEPTATION DE L'INGÉNIEUR. / ANY CHANGES REQUESTED BY THE CONTRACTOR REQUIRING CHANGES TO THE STRUCTURE (EQUIVALENCE, CHANGE OF MECHANICAL UNIT, MODIFICATION TO OPENING DIMENSIONS, ETC.), ARE AT THE CONTRACTOR'S EXPENSE. THE TIME ALLOCATED BY THE ENGINEER FOR THE STUDY, THE CALCULATIONS AND THE ISSUE OF SKETCHES THROUGH THESE CHANGES, ARE ALSO AT THE EXPENSES OF THE CONTRACTOR ON NOTICE. MAKE CHANGES AFTER THE ACCEPTANCE OF THE ENGINEER.

DESSINS D'ATELIER / SHOP DRAWINGS

1. SOUMETTRE À L'INGÉNIEUR, UN ORIGINAL ET DEUX (2) COPIES POUR COMMENTAIRES DES DESSINS D'ATELIER, DESCRIPTIONS DE PRODUITS ET ÉCHANTILLONS PRESCRITS. LE NOM DU PROJET DOIT CLAIREMENT ÊTRE INDIQUÉ SUR CES DOCUMENTS. / SUBMIT 2 HARD COPIES OR PDF'S OF SHOP DRAWINGS, PRODUCT DESCRIPTIONS AND PRESCRIBED SAMPLES FOR REVIEW BEFORE START OF WORK. PACKAGES TO BE SUBMITTED ARE NOTED IN THE RELEVANT SECTIONS BELOW.

2. LES DESSINS D'ATELIER DOIVENT ÊTRE SCELLÉS ET SIGNÉS PAR UN INGÉNIEUR MEMBRE DE L'O.I.Q. / SHOP DRAWINGS MUST BE SEALED AND SIGNED BY AN O.I.Q MEMBER ENGINEER.

3. AU PRÉALABLE, L'ENTREPRENEUR GÉNÉRAL DOIT AVOIR REVU LES DOCUMENTS AVANT DE LES TRANSMETTRE À L'INGÉNIEUR. / IN ADVANCE, THE GENERAL CONTRACTOR SHOULD HAVE REVIEWED THE DOCUMENTS BEFORE TRANSMITTING THEM TO THE ENGINEER.

4. IL EST DÉFENDU D'ENTREPRENDRE DES TRAVAUX DONT LES DESSINS D'ATELIER, ÉCHANTILLONS ET DESCRIPTIONS DE PRODUITS N'ONT PAS ÉTÉ RETOURNÉS AVEC LES COMMENTAIRES DE L'INGÉNIEUR. / DO NOT COMMENCE FABRICATION BEFORE THE WORKSHOP DRAWINGS, SAMPLES AND PRODUCT DESCRIPTIONS HAVE NOT BEEN RETURNED WITH THE COMMENTS OF THE ENGINEER.

5. ALLOUER UN DÉLAI DE DEUX (2) SEMAINES À L'INGÉNIEUR POUR LA VÉRIFICATION DES DESSINS D'ATELIER. / ALLOW A MINIMUM OF 10 WORKING DAYS FOR REVIEW OF EACH SUBMISSION OF SHOP DRAWINGS IN THE STRUCTURAL CONSULTANT'S OFFICE.

INSPECTION DES TRAVAUX / FIELD REVIEW

1. L'ENTREPRENEUR DOIT AVISER L'INGÉNIEUR AU MOINS 24 HEURES AVANT CHAQUE COULÉE DE BÉTON. AUCUN BÉTONNAGE NE DOIT ÊTRE ENTREPRIS AVANT QUE L'INGÉNIEUR N'AIT OBSERVÉ LES COFFRAGES ET L'ACIER D'ARMATURE. / NOTIFY THE CONSULTANT 48 HOURS PRIOR TO CONCRETE POURS, BACKFILLING, AND COVERING UP THE STRUCTURE WITH FINISHES.

DIVISION 02 00 00 - CONDITIONS EXISTANTES / EXISTING STRUCTURES

GÉNÉRALITÉS / GENERAL

1. EXÉCUTER LES TRAVAUX DE DÉMOLITION STRUCTURALE CONFORMÉMENT À LA NORME CSA S350 ET AU CODE DE SÉCURITÉ DU QUÉBEC. / EXECUTE STRUCTURAL DEMOLITION WORK IN ACCORDANCE WITH CSA STANDARD S350 AND QUEBEC'S SECURITY CODE.

1. REMETTRE AU PROPRIÉTAIRE, À L'ENDROIT DE SON CHOIX, LES ÉQUIPEMENTS ET MATÉRIAUX QU'IL DÉSIRE CONSERVER AVANT D'ENTREPRENDRE LES TRAVAUX. / REMOVE FROM SITE ALL OTHER STRUCTURAL ELEMENTS AND PRODUCTS WHICH ARE NOT INDICATED TO BE HANDED OVER TO THE OWNER.

2. APRÈS LE DÉGARNISSAGE, L'ENTREPRENEUR DOIT AVERTIR L'INGÉNIEUR AFIN QUE CELUI-CI PUISSE PROCÉDER À UN EXAMEN DE LA STRUCTURE EXISTANTE, ET MODIFIER LES PLANS S'IL Y A LIEU. / AFTER CLEARING, THE CONTRACTOR MUST INFORM THE ENGINEER SO THAT HE CAN EXAMINE THE EXISTING STRUCTURE AND CHANGE THE PLANS IF REQUIRED.

3. DÉMOLIR TOUS LES ÉLÉMENTS ET OUVRAGES INDIQUÉS AUX PLANS DE STRUCTURE. / DEMOLISH ALL THE ELEMENTS AND WORKS INDICATED IN THE STRUCTURE PLANS.

4. TOUS LES TRAVAUX DE SOUTIEN TEMPORAIRE SONT SOUS LA GOUVERNE ET LA RESPONSABILITÉ DE L'ENTREPRENEUR. CELUI-CI EST TENU DE PRENDRE TOUTES LES MESURES NÉCESSAIRES ET INSTALLER EN QUANTITÉ SUFFISANTE LES SUPPORTS ADÉQUATS AFIN D'ASSURER LA SÉCURITÉ DES STRUCTURES À CONSERVER ET DES OUVRIERS. CES TRAVAUX DOIVENT RESPECTER LES CODES ET LES LOIS EN VIGUEUR, ET EN PARTICULIER LES LOIS DE LA CNESST. / ALL DEMOLITION, SHORING AND OTHER TEMPORARY WORKS TO BE DESIGNED BY A PROFESSIONAL ENGINEER RETAINED BY THE CONTRACTOR, LICENSED IN THE PLACE WHERE THE PROJECT IS LOCATED. PREPARE DRAWINGS SIGNED AND SEALED BY THAT ENGINEER SHOWING DEMOLITION PROCEDURE AND SEQUENCE AND ALL THE NECESSARY SHORING. THE WORK MUST COMPLY WITH THE CODES AND LAWS IN EFFECT, AND IN PARTICULAR THE LAWS OF CNESST.

5. AVANT LE DÉBUT DES TRAVAUX, S'ASSURER QUE LES SERVICES DE MÉCANIQUE ET D'ÉLECTRICITÉ ONT ÉTÉ MIS HORS D'USAGE DANS LES PARTIES DU BÂTIMENT À DÉMOLIR ET QU'ILS ONT ÉTÉ SECTIONNÉS À LA LIGNE DE SÉPARATION AVEC LES PARTIES À CONSERVER. À MOINS D'INDICATION CONTRAIRE, TOUS LES AUTRES SERVICES DOIVENT ÊTRE MAINTENUS DURANT LES TRAVAUX. / BEFORE THE START OF THE WORK, ENSURE THAT THE MECHANICAL AND ELECTRICAL SERVICES HAVE BEEN OFF-USE IN PARTS OF THE BUILDING TO BE DEMOLISH AND THAT THEY HAVE BEEN DIVIDED TO THE LINE OF SEPARATION WITH THE PARTS TO SAVE. UNLESS OTHERWISE INDICATED, ALL OTHER SERVICES MUST BE MAINTAINED DURING THE WORK.

6. UTILISER DES ÉQUIPEMENTS ET PROCÉDER AUX TRAVAUX DE DÉMOLITION DE FAÇON À LIMITER LE BRUIT ET LES VIBRATIONS À UN NIVEAU ACCEPTABLE POUR LES USAGERS ET LES ÉQUIPEMENTS DU BÂTIMENT ET DE CEUX ADJACENTS. / SCHEDULE WORK TO MINIMIZE EFFECT ON THE EXISTING BUILDING OPERATION. USE EQUIPMENT AND PROCEDURES TO MINIMIZE NOISE, DUST AND VIBRATIONS. SUBMIT PROPOSED SCHEDULE FOR REVIEW BY THE CONSULTANT AND THE OWNER.

2. PRENDRE SOIN DE NE PAS ENDOMMAGER LES PARTIES À CONSERVER DU BÂTIMENT ET AJOUTER TOUS LES OUVRAGES DE PROTECTION REQUIS AVANT LE DÉBUT DES TRAVAUX. LES DOMMAGES CAUSÉS PAR L'ENTREPRENEUR EN DEHORS DES DÉMOLITIONS PRÉVUES, DOIVENT ÊTRE RÉPARÉS À SES FRAIS. / INSTALL AND AFTERWARDS REMOVE ALL TEMPORARY SHORING AND BRACING REQUIRED TO ENSURE THE INTEGRITY OF THE EXISTING STRUCTURE DURING CONSTRUCTION. DAMAGE CAUSED BY THE CONTRACTOR OUTSIDE THE SCHEDULED DEMOLITIONS MUST BE REPAIRED AT ITS EXPENSE.

7.

8. À LA FIN DE CHAQUE JOURNÉE DE TRAVAIL, S'ASSURER QU'AUCUN OUVRAGE NE PUISSE S'AFFAISSER NI S'EFFONDRER. / AT THE END OF EVERY DAY OF WORK, ENSURE THAT NO WORK IS INSTABLE.

9. DÉMOLIR DE MANIÈRE À SOULEVER LE MOINS DE POUSSIÈRE POSSIBLE ET MOUILLER LES MATÉRIAUX POUSSIÉREUX. / DEMOLISH TO LIFT LESS POSSIBLE DUST AND WET DUSTY MATERIALS.

10. TRANSPORTER HORS DES LIEUX TOUS LES PRODUITS DE DÉMOLITION, LES DÉBLAIS AINSI QUE LES MATÉRIAUX D'EXCAVATION AU FUR ET À MESURE DE LA PROGRESSION DES TRAVAUX. / CARRY OUT ALL DEMOLITION PRODUCTS, DEBLAIS, EXCAVATION MATERIALS GRADUALLY TO THE WORK PROGRESSION.

DIVISION 05 00 00 - MÉTAUX / STRUCTURAL STEEL

GÉNÉRALITÉS / GENERAL

1. EXÉCUTER LES OUVRAGES EN CHARPENTE D'ACIER CONFORMÉMENT AUX NORMES CAN/CSA-S16 ET CAN/CSA-S136. / CONFORME TO CAN/CSA-S16 AND CAN/CSA-S136.

2. SE REPORTER AUX PLANS ET DEVIS D'ARCHITECTURE ET DE MÉCANIQUE POUR TOUS LES OUVRAGES QUI PEUVENT INTERFÉRER OU AFFECTER LES ÉLÉMENTS DE LA STRUCTURE D'ACIER. / REFER TO THE ARCHITECTURE AND MECHANICAL PLANS AND SPECIFICATIONS FOR ALL WORKS THAT MAY INTERFERE WITH OR AFFECT THE ELEMENTS OF THE STEEL STRUCTURE.

3. L'ENTREPRENEUR EST RESPONSABLE DE VÉRIFIER SUR PLACE TOUTES LES DIMENSIONS ET TOUS LES NIVEAUX SE REPORTANT AUX POINTS D'ANCRAGE DE LA STRUCTURE D'ACIER, AVANT DE COMMENCER LA FABRICATION. / THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ON SITE ALL DIMENSIONS AND ALL LEVELS REFERRING TO THE ANCHORING POINTS OF THE STEEL STRUCTURE BEFORE STARTING THE MANUFACTURE.

4. À MOINS D'INDICATION CONTRAIRE SUR LES PLANS, PRÉVOIR UN ESPACE DE 25mm (1") SOUS LES PLAQUES DE BASE DES POTEAUX POUR LA POSE DU MORTIER SANS RETRAIT. / UNLESS OTHERWISE INDICATED ON THE PLANS, PROVIDE A SPACE OF 25mm (1 ") UNDER THE BASE PLATES OF THE POSTS FOR THE INSTALLATION OF THE MORTAR WITHOUT REMOVAL.

5. FOURNIR ET POSER LES RENFORTS, ENCADREMENTS, ÉLÉMENTS DE CONTREVENTEMENT AINSI QU'AUTRES PIÈCES D'ACIER NON INDIQUÉES AUX PLANS ET DEVIS, NÉCESSAIRES POUR OBTENIR UN OUVRAGE COMPLET. / PROVIDE AND INSTALL THE REINFORCEMENTS, FRAMES, REINFORCING ELEMENTS AND OTHER STEEL PARTS NOT INDICATED IN THE PLANS AND SPECIFICATIONS REQUIRED TO OBTAIN A COMPLETE WORK.

6. À MOINS D'INDICATION CONTRAIRE, TOUS LES ÉLÉMENTS D'ACIER ENCASTRÉ DANS LE BÉTON ET/OU EXPOSÉS AUX INTEMPÉRIES DOIVENT ÊTRE GALVANISÉS. / UNLESS OTHERWISE INDICATED, ALL THE STEEL ELEMENTS INSERTED IN THE CONCRETE AND / OR EXPOSED TO THE WEATHER MUST BE GALVANIZED.

7. L'ENTREPRENEUR DOIT FOURNIR À L'INGÉNIEUR, POUR VÉRIFICATION, LES DESSINS D'ATELIER MONTRANT LES MEMBRURES, LES BOULONS D'ANCRAGE, LES ASSEMBLAGES ET LES SOUDURES. CES DESSINS DOIVENT ÊTRE SIGNÉS ET SCELLÉS PAR UN INGÉNIEUR. / THE CONTRACTOR MUST PROVIDE TO THE ENGINEER, FOR VERIFICATION, SHOP DRAWINGS SHOWING MEMBERS, ANCHORING BOLTS, ASSEMBLIES AND WELDING. THESE DRAWINGS MUST BE SIGNED AND SEALED BY AN ENGINEER.

MATÉRIAUX / MATERIALS

1. ACIER DE CONSTRUCTION POUR BÂTIMENTS :
   a. PROFILÉS LAMINÉS : CONFORMES À LA NORME CSA G40.21, NUANCE 350 W.
   b. PROFILÉS TUBULAIRES : CONFORMES À LA NORME ASTM A500 GRADE C (345 MPa).
   c. PLAQUES, BARRES, CORNIÈRES ET PROFILÉS EN "C" : CONFORMES À LA NORME CSA G40.21, NUANCE 300 W.

   MATERIALS: TO CSA G40.21 UNLESS OTHERWISE NOTED, WITH THE FOLLOWING GRADES:
   a. W, WWF AND S SECTIONS : 350 W OR ASTM A992, GRADE 50 (345MPa).
   b. HOLLOW STRUCTURAL SECTIONS: 350W (CLASS "C" OR "H"), ASTM A1085 GRADE 50 (345 MPa) OR ASTM A500 (GRADE "C").
   c. PLATES, BARS, CHANNELS ANS ANGLES : CSA G40.21, GRADE 300 W

2. BOULONS, ÉCROUS ET RONDELLES DES ASSEMBLAGES : CONFORMES À LA NORME ASTM A325. / BOLTS, NUTS AND WASHERS OF ASSEMBLAGES AS PER ASTM A325.

3. BOULONS D'ANCRAGE :
   a. ANCRAGES CHIMIQUES: DE TYPE "HIT-HY 200" DE HILTI.
   b. ANCRAGES MÉCANIQUES: DE TYPE "HSL" DE HILTI (S.I.C.).

   ANCHOR BOLTS:
   a. CHEMICAL ANCHORS: TYPE "HIT-HY 200" FROM HILTI.
   b. MECHANICAL ANCHORS: TYPE "HSL" FROM HILTI (S.I.C.).

4. MATÉRIAUX DE SOUDURE : CONFORMES À LA NORME CSA W48. / WELDING MATERIALS: COMPLY WITH CSA W48.

5. PEINTURE :
   a. APPRÊT APPLIQUÉ EN ATELIER SUR TOUS LES ÉLÉMENTS DE CHARPENTE D'ACIER CONFORME À LA NORME ICCA/AFPC (CISC/CPMA) 1-73a. PRÉPARATION ET POSE CONFORMES AUX RECOMMANDATIONS DU MANUFACTURIER (AVEC RETOUCHES AU CHANTIER).
   b. APPRÊT APPLIQUÉ EN ATELIER SUR TOUS LES ÉLÉMENTS DE CHARPENTE D'ACIER DEVANT RECEVOIR UNE PEINTURE DE FINITION APRÈS ÉRECTION (VOIR ARCHITECTURE), CONFORME AUX EXIGENCES DE LA NORME ICCA/AFPC (CISC/CPMA) 2-75 DE COULEUR GRISE OU ROUGE. PRÉPARATION ET POSE CONFORMES AUX RECOMMANDATIONS DU MANUFACTURIER (AVEC RETOUCHES AU CHANTIER).
   c. APRÈS ÉRECTION, PEINDRE BOULONS, SOUDURES ET SURFACES ENDOMMAGÉES.

   PEINT:
   a. . PRIMER APPLIED IN WORKSHOP ON ALL STEEL FRAMEWORK COMPONENTS IN ACCORDANCE WITH CISC / PSAC STANDARD (CISC / CPMA) 1-73a. PREPARATION AND INSTALLATION IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS (WITH RETOUCHES ON THE SITE)
   b. PRIMER APPLIED IN WORKSHOP ON ALL STEEL FRAMEWORK ELEMENTS TO BE RECEIVED AFTER ERECTION FINISHING PAINT (SEE ARCHITECTURE), COMPLYING WITH THE REQUIREMENTS OF CISCO / PSAC STANDARD (CISC / CPMA) 2-75 OF GRAY OR RED COLOR. PREPARATION AND INSTALLATION IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS (WITH RETOUCHES ON THE SITE).)
   c. AFTER ERECTION, PAINT THE BOLTS, WELDING AND DAMAGED SURFACES.

6. GALVANISATION DES PROFILÉS D'ACIER, PLAQUES ET BOULONS : CONFORMES À LA NORME CAN/CSA-G164. LE TAUX D'APPLICATION DE LA COUCHE DE REVÊTEMENT DOIT EXCÉDER 600 g/m2. / GALVANIZING STEEL PROFILES, PLATES AND BOLTS: COMPLY WITH CAN / CSA-G164. THE APPLICATION RATE OF THE COATING LAYER MUST EXCEED 600 g / m2.

7. APPRÊT POUR RETOUCHES DES SURFACES GALVANISÉES : APPRÊT RICHE EN ZINC, CONFORME À LA NORME ONGC 1-GP-181a. / PRIMER FOR GALVANIZED SURFACES: PRIMER RICH IN ZINC, COMPLYING WITH CGSB STANDARD 1-GP-181a.

8. TOUT L'ACIER EXPOSÉ AUX INTEMPÉRIES DOIT ÊTRE GALVANISÉ À CHAUD. / ALL STAINLESS STEEL MUST BE GALVANIZED HOT.

ASSEMBLAGES / CONNECTIONS

1. EFFECTUER LES ASSEMBLAGES EN USINE OU AU CHANTIER, SUIVANT LES DÉTAILS MONTRÉS SUR LES PLANS DE STRUCTURE. EN L'ABSENCE D'INFORMATIONS PRÉCISES, CALCULER ET EXÉCUTER LES ASSEMBLAGES SUIVANT LES EXIGENCES DE LA NORME CAN/CSA-S16. / MAKE ASSEMBLIES IN FACTORY OR SITE, FOLLOWING THE DETAILS SHOWN ON THE STRUCTURE PLANS. IN THE ABSENCE OF SPECIFIC INFORMATION, CALCULATE AND EXECUTE ASSEMBLIES FOLLOWING THE REQUIREMENTS OF CAN / CSA-S16.

2. À MOINS D'INDICATION CONTRAIRE SUR LES DESSINS, TOUS LES ASSEMBLAGES EXÉCUTÉS EN ATELIER SONT SOUDÉS ET CEUX EXÉCUTÉS AU CHANTIER SONT BOULONNÉS. / UNLESS OTHERWISE INDICATED ON THE DRAWINGS, ALL THE ASSEMBLIES EXECUTED IN THE WORKSHOP ARE WELDED AND THOSE EXECUTED AT THE SITE ARE BOLTED.

3. À MOINS D'INDICATION CONTRAIRE, UTILISER DES BOULONS 20 mm (3/4") DE DIAMÈTRE AVEC UN MINIMUM DE 2 BOULONS PAR ASSEMBLAGE. / UNLESS OTHERWISE INDICATED USE BOLTS 20 mm (3/4 ") DIAMETER WITH A MINIMUM OF 2 BOLTS PER ASSEMBLY.

4. LES SOUDURES DOIVENT ÊTRE EFFECTUÉES CONFORMÉMENT À LA NORME CSA W59 PAR UN FABRICANT RECONNU PAR LE "BUREAU CANADIEN DE LA SOUDURE" RÉPONDANT À TOUTES LES EXIGENCES DE LA NORME CSA W47.1 ET ACCRÉDITÉ À LA DIVISION 1 ET 2.1. / WELDINGS MUST BE MADE IN ACCORDANCE WITH CSA W59 BY A MANUFACTURER RECOGNIZED BY THE "CANADIAN WELDING OFFICE" THAT MEETS ALL REQUIREMENTS OF CSA STANDARD W47.1 AND ACCREDITED TO DIVISION 1 AND 2.1.

5. UTILISER DES ÉLECTRODES E49XX CONFORMES À LA NORME CSA W48. / USE E49XX ELECTRODES IN ACCORDANCE WITH CSA W48.

6. TOUTES LES SOUDURES D'ABOUT DOIVENT ÊTRE À PÉNÉTRATION COMPLÈTE. / ALL WELDING MUST BE COMPLETE PENETRATION.

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CLIENT / CLIENT:

AGRICULTURE ET AGROALIMENTAIRE CANADA (AAC)

RÉF. CLIENT / CLIENT REF. #: 532971

PROJET / PROJECT:

Remplacement de tours d'eau Centre de recherche et de développement de St-Jean-sur-Richelieu/ Replacement of cooling tower for Research and Development Center St-Jean -sur-Richelieu

PLAN CLÉ / KEY PLAN:

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ÉM./IS. RV./RV.	DATE / DATE	DESCRIPTION / DESCRIPTION
A	2019-08-20	ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER

NO PROJET / PROJECT NO: 191-08126-00	DATE / DATE: 2019-07-16
ÉCHELLE ORIGINALE / ORIGINAL SCALE: INDIQUÉE	SI CETTE BARRE NE MESURE PAS 25 mm, AJUSTER VOTRE ÉCHELLE DE TRAÇAGE. IF THIS BAR IS NOT 25 mm LONG, ADJUST YOUR PLOTTING SCALE. 25 mm
PRÉPARÉ PAR / PREPARE BY: SIMONA DAVID, ing.	
MODIFIÉ PAR / MODIFIED BY: --	
ASSISTÉ DE / ASSISTED BY: ISABELLE LAUZON, ing.	
DESSINÉ PAR / DRAWN BY: G.P.	

DISCIPLINE / DISCIPLINE:

STRUCTURE / STRUCTURE

TITRE / TITLE:

**NOTES GÉNÉRALES
GENERAL NOTES**

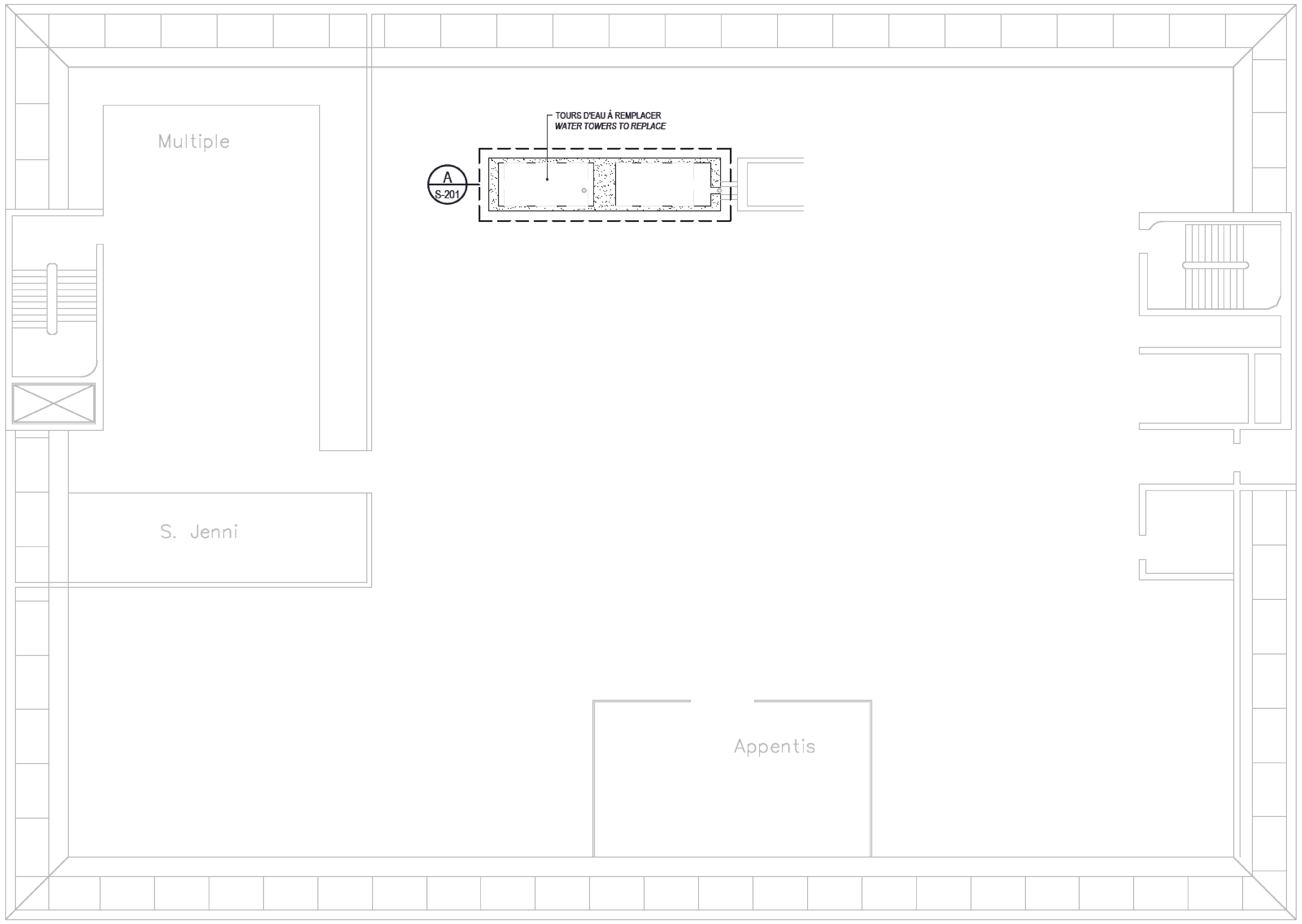
NUMÉRO DU FEUILLET / SHEET NUMBER:

S-001

FEUILLET # / SHEET #: 2 DE / OF 4

ÉMISSION / ISSUE: **ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER** # RV./RV. #: 0

EN DATE DU / DATE OF: 2019-08-20



VUE EN PLAN - NIVEAU "3" / PLAN VIEW - LEVEL "3"

1:100

NOTES: NIVEAU "3" / *LEVEL "3"*

- L'ENTREPRENEUR DOIT S'ASSURER QUE L'INTÉGRITÉ STRUCTURALE DU BÂTIMENT N'EST PAS COMPROMISE EN TOUT TEMPS. ASSUMER, LE CAS ÉCHÉANT, LES COÛTS DES TRAVAUX CORRECTIFS REQUIS. / *THE CONTRACTOR MUST ENSURE THAT THE STRUCTURAL INTEGRITY OF THE BUILDING IS NOT COMPROMISED AT ALL TIMES. ASSUME, IF NECESSARY, THE COSTS OF CORRECTIVE WORK REQUIRED.*
- PROTÉGER LES AIRES DE TRAVAIL ET PERMETTRE L'ACCÈS AUX AIRES AUX PERSONNES AUTORISÉES SEULEMENT DURANT LES TRAVAUX. / *PROTECT WORK AREAS AND ENABLE ACCESS TO AREAS TO PERSONS AUTHORIZED ONLY DURING WORK.*
- AVERTIR IMMÉDIATEMENT L'INGENIEUR DE TOUTE CONDITION PARTICULIÈRE RENCONTRÉE AU CHANTIER AVANT DE POURSUIVRE LES TRAVAUX. / *IMMEDIATELY NOTIFY THE ENGINEER OF ANY SPECIAL CONDITIONS ENCOUNTERED AT THE SITE BEFORE CONTINUING THE WORK.*
- AVERTIR L'INGÉNIEUR EN CAS DE CONDITIONS AU CHANTIER DIFFÉRENTES DE CELLES MONTRÉES AUX PLANS. / *ADVISE THE ENGINEER IN THE EVENT OF DIFFERENT CONDITIONS ON THE SITE OF THOSE SHOWN ON THE PLANS.*

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NO PROJET / PROJECT NO: 191-08126-00

DATE / DATE: 2019-07-16

ÉCHELLE ORIGINALE / ORIGINAL SCALE: INDIQUÉE

PRÉPARÉ PAR / PREPARE BY: SIMONA DAVID, ing.

MODIFIÉ PAR / MODIFIED BY: --

ASSISTÉ DE / ASSISTED BY: ISABELLE LAUZON, ing.

DESSINÉ PAR / DRAWN BY: G.P.

SI CETTE BARRE NE MESURE PAS 25 mm, AJUSTER VOTRE ÉCHELLE DE TRAÇAGE.

IF THIS BAR IS NOT 25 mm LONG, ADJUST YOUR PLOTTING SCALE.

25 mm

DISCIPLINE / DISCIPLINE: **STRUCTURE / STRUCTURE**

TITRE / TITLE:

VUE EN PLAN - NIVEAU "3"
PLAN VIEW - LEVEL "3"

NUMÉRO DU FEUILLET / SHEET NUMBER: **S-101**

FEUILLET # / SHEET #: 3 DE / OF 4

ÉMISSION / ISSUE: **ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER**

RV./RV. #: 0

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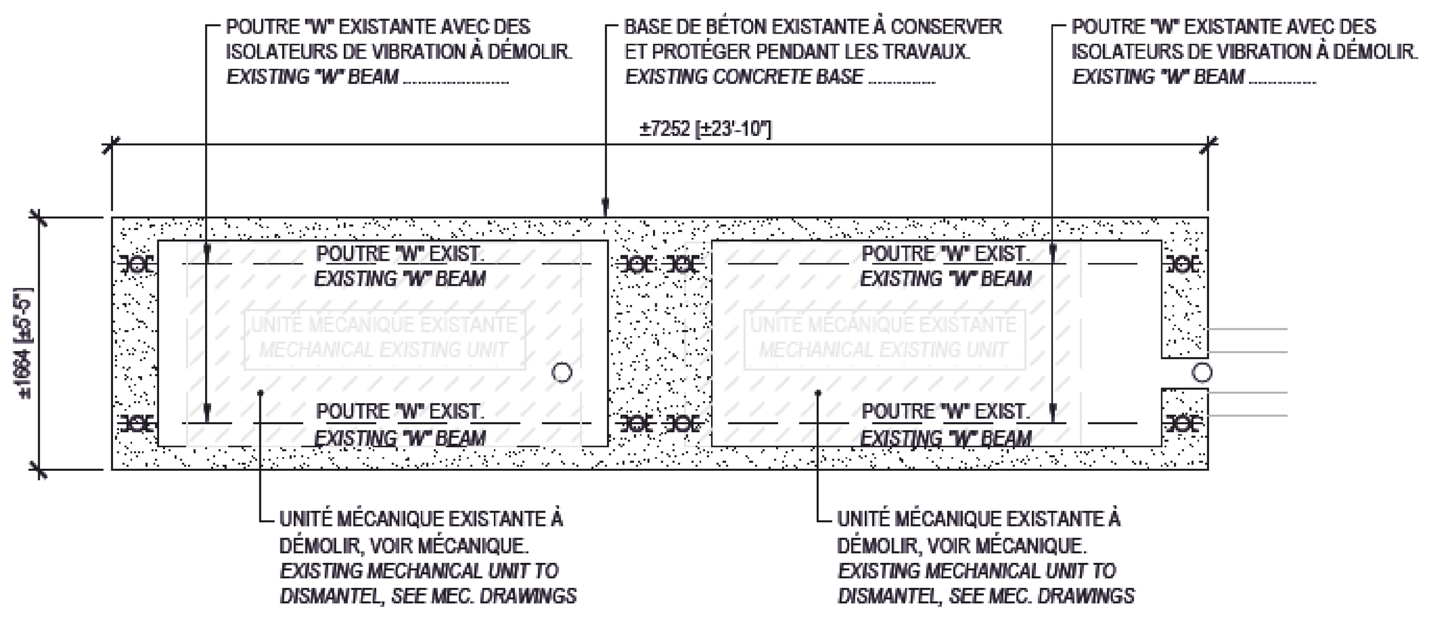
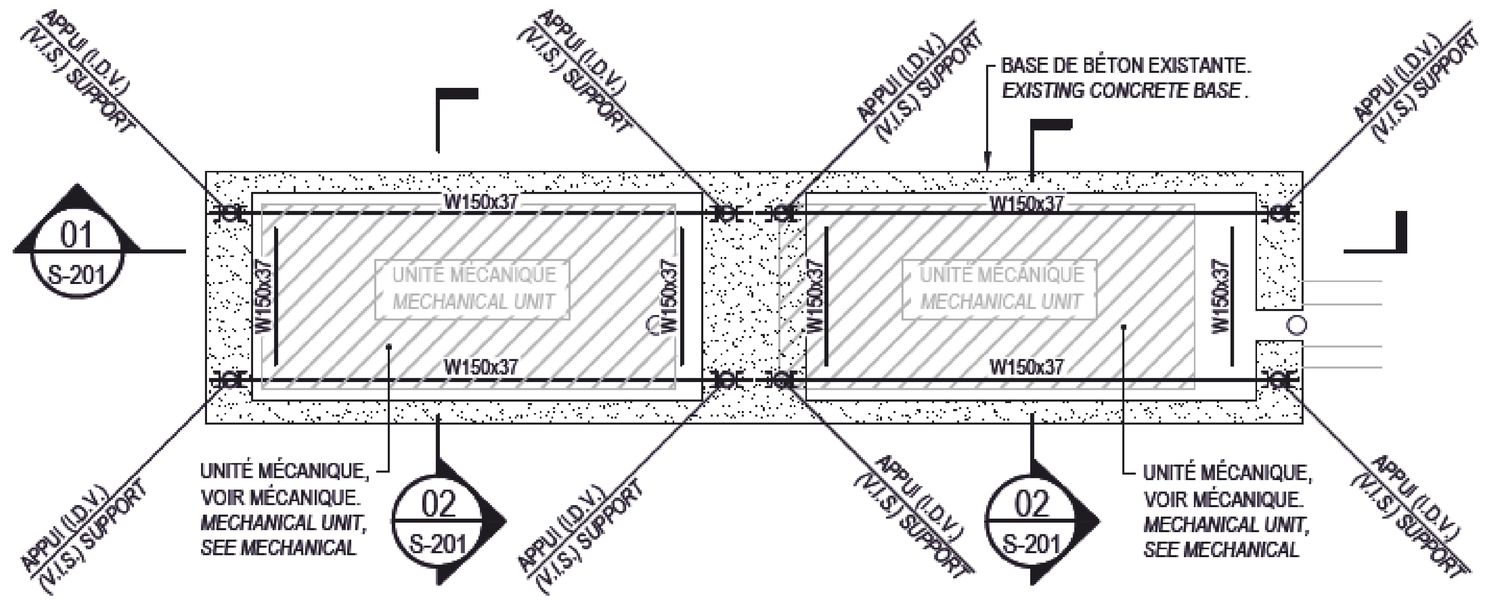


DÉMOLITION / *DEMOLITION*



NOTES:

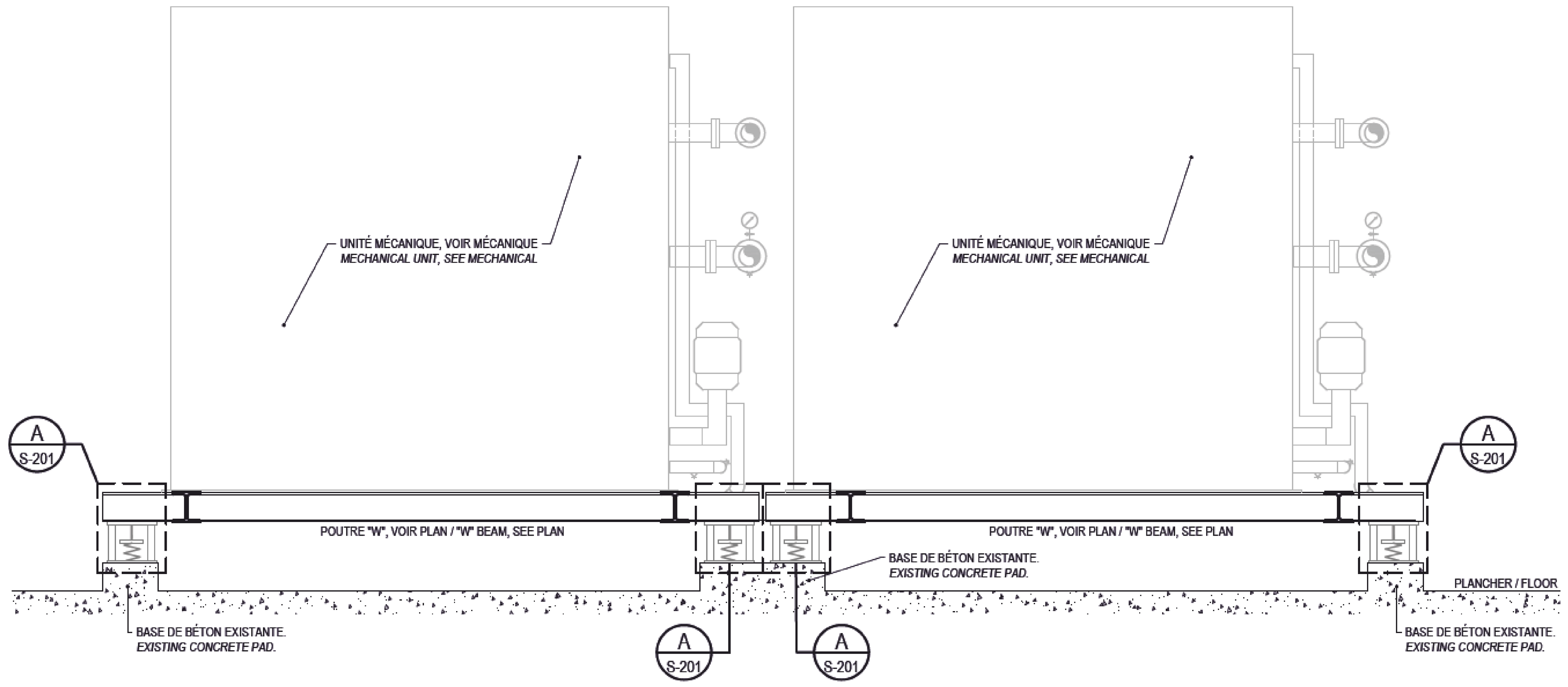
- POUR LOCALISATION EXACTE DE L'UNITÉ MÉCANIQUE, VOIR MÉCANIQUE. / *FOR EXACT LOCATION OF THE MECHANICAL UNIT, SEE MECHANICAL..*
- LES POSITIONS DES POUTRES SONT À VALIDER PAR L'ENTREPRENEUR GÉNÉRAL AVEC LES DIMENSIONS DES UNITÉS MÉCANIQUES QUI SERONT FOURNIES. / *THE POSITIONS OF BEAMS ARE VALIDATED BY THE GENERAL CONTRACTOR WITH THE DIMENSIONS OF THE MECHANICAL UNITS THAT WILL BE SUPPLIED.*
- POUR LES APPUIS D'ISOLATEUR DE VIBRATION, VOIR MÉCANIQUE. / *FOR VIBRATION ISOLATOR SUPPORT, SEE MECHANICAL.*
- TOUS L'ACIER SERA GALVANISÉ À CHAUD. / *ALL STEEL WILL BE GALVANIZED HOT.*
- TOUS LES ÉLÉMENTS DOIVENT ÊTRE ASSEMBLÉS RIGIDEMENT. / *ALL ELEMENTS MUST BE ASSEMBLED RIGIDELY.*
- COORDONNER LE PERCEMENT DES TROUS REQUIS POUR LA FIXATION DE L'UNITÉ MÉCANIQUE AVEC LE FOURNISSEUR DE L'UNITÉ. / COORDINATE THE DRILLING OF THE HOLES REQUIRED FOR THE ATTACHMENT OF THE MECHANICAL UNIT WITH THE SUPPLIER OF THE UNIT.

LÉGENDE / LEGEND:

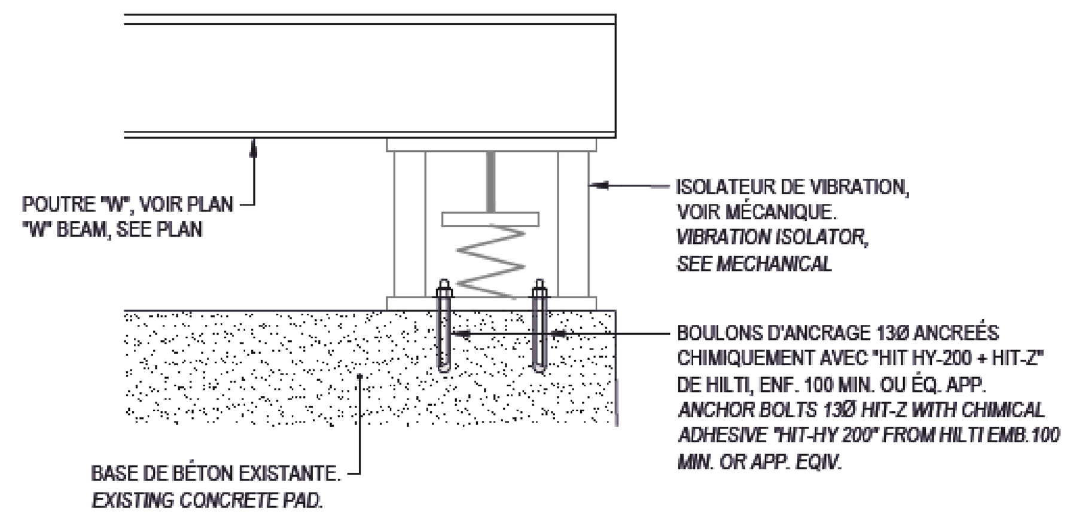
(I.D.V.) APPUIS D'ISOLATEUR DE VIBRATION, VOIR MÉCANIQUE.
(V.I.S.) VIBRATION ISOLATOR SUPPORT, SEE MECHANICAL.

RECONSTRUCTION / *RECONSTRUCTION*

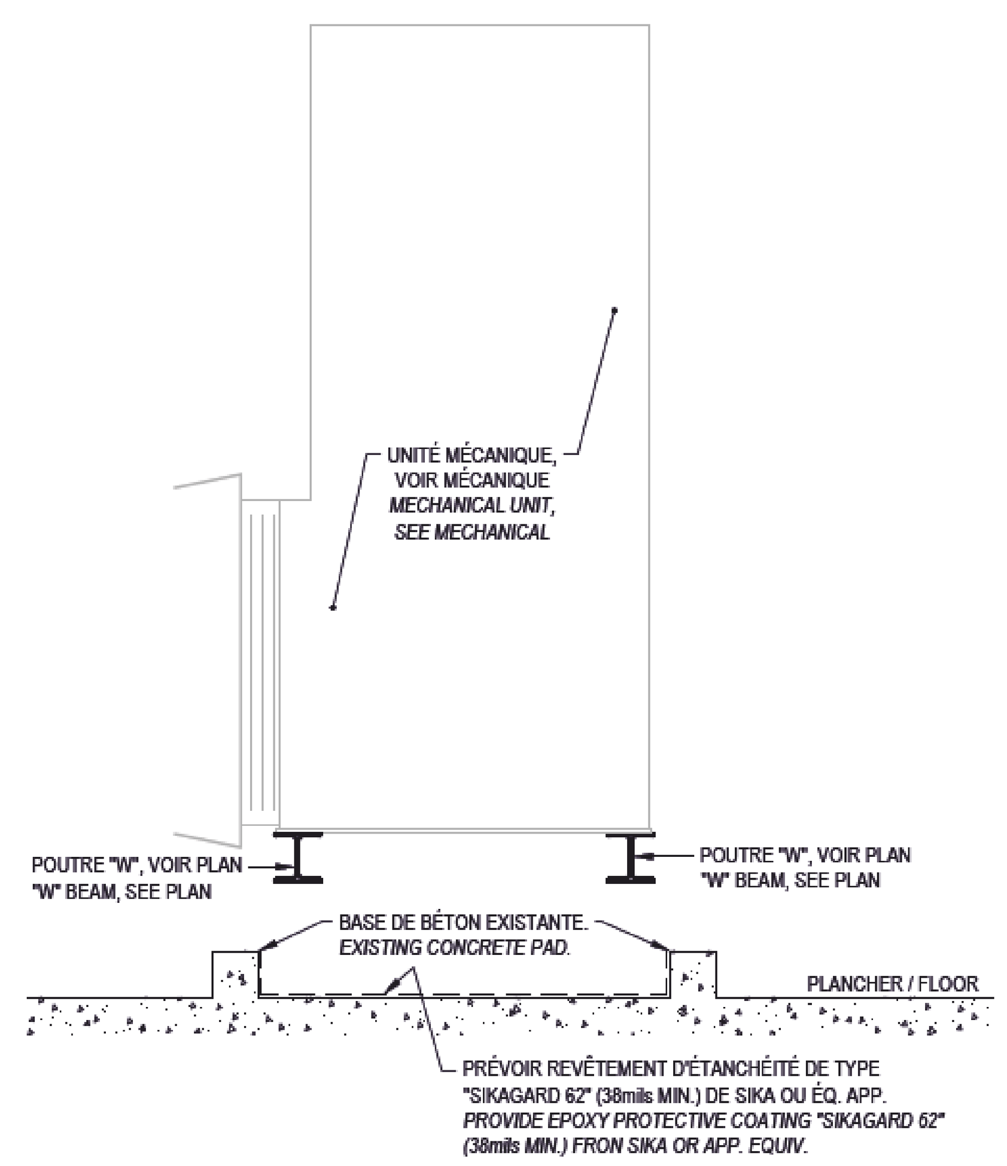
A / S101 — PLAN AGRANDI - SUPPORT D'ÉQUIPEMENT MÉCANIQUE
EXTEND PLAN - MECHANICAL EQUIPMENT SUPPORT
ÉCHELLE / SCALE : 1:50



01 / S-101 — COUPE / SECTION
ÉCHELLE / SCALE : 1:25



A / S-201 — DÉTAIL / DETAIL
ÉCHELLE / SCALE : 1:25



02 / S-101 — COUPE / SECTION
ÉCHELLE / SCALE : 1:25

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Remplacement de tours d'eau Centre de recherche et de développement de St-Jean-sur-Richelieu/ Replacement of cooling tower for Research and Development Center St-Jean -sur-Richelieu

PLAN CLÉ / KEY PLAN:

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MODIFIÉ PAR / MODIFIED BY: --
ASSISTÉ DE / ASSISTED BY: ISABELLE LAUZON, ing.
DESSINÉ PAR / DRAWN BY: G.P.

SI CETTE BARRE NE MESURE PAS 25 mm, AJUSTER VOTRE ÉCHELLE DE TRAÇAGE.
IF THIS BAR IS NOT 25 mm LONG, ADJUST YOUR PLOTTING SCALE.
25 mm

DISCIPLINE / DISCIPLINE: **STRUCTURE / STRUCTURE**

TITRE / TITLE:

COUPES & DÉTAILS
SECTIONS & DETAILS

NUMÉRO DU FEUILLET / SHEET NUMBER: **S-201**

FEUILLET # / SHEET #: 4 DE / OF 4

ÉMISSION / ISSUE: **ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER**
RV./RV. #: 0
EN DATE DU / DATE OF: 2019-08-20

REMPLACEMENT DE TOURS D'EAU
CENTRE DE RECHERCHE ET DE DÉVELOPPEMENT
ST-JEAN-SUR-RICHELIEU/
REPLACEMENT OF COOLING TOWER FOR
RESEARCH AND DEVELOPMENT CENTER
ST-JEAN-SUR-RICHELIEU

CES DOCUMENTS NE DOIVENT PAS ÊTRE UTILISÉS À DES FINS DE CONSTRUCTION (OU DE FABRICATION).

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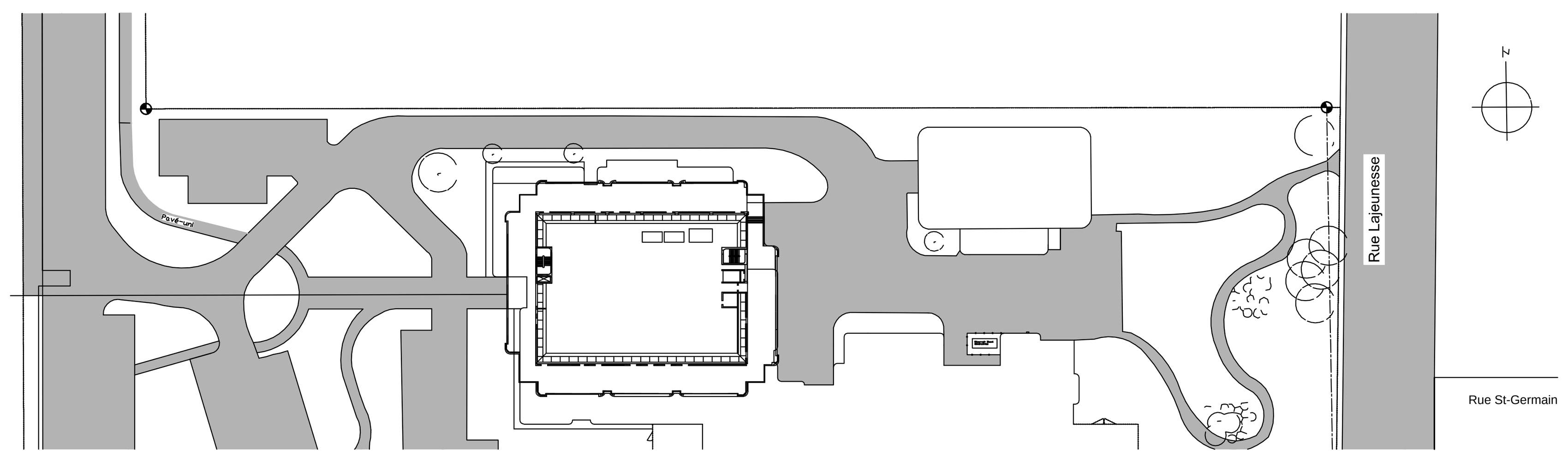
LÉGENDE / LEGEND

PLOMBERIE / PLUMBING

- S — DRAIN SANITAIRE HORS TERRE / SANITARY DRAIN ABOVE SLAB
- TUYAUTERIE EXISTANTE À CONSERVER / EXISTING PIPING TO REMAIN
- TUYAUTERIE EXISTANTE À ENLEVER / EXISTING PIPING TO BE DEMOLISHED
- EAU FROIDE DOMESTIQUE / DOMESTIC COLD WATER
- E.H. (VERS LE HAUT) / UP (UP)
- E.B. (VERS LE BAS) / DN (DOWN)
- BOUCHON ÉTANCHE / END CAP
- T — THERMOSTAT / THERMOSTAT
- ROBINET D'ISOLEMENT / SHUT–OFF VALVE
- C — COMPTEUR D'EAU / WATER METER
- AET — ALIMENTATION EAU DE TOUR / CHILLED WATER SUPPLY
- RET — RETOUR EAU DE TOUR / CHILLED WATER RETURN
- UNION / UNION
- RO — RENVOI OUVERT / OPEN DRAIN
- THERMOMÈTRE ET MANOMÈTRE c/a ROBINET D'ARRÊT / THERMOMETER AND MANOMETER c/w SHUT–OFF COCK
- ROBINET SUR TUYAU VERTICAL / VALVE ON A VERTICAL PIPE
- R.V. — ROBINET DE VIDANGE / DRAIN VALVE
- R — POINT DE RACCORDEMENT / CONNECTION POINT
- D — POINT DE DÉBUT OU FIN DE DÉMOLITION / POINT OF START OR END OF DEMOLITION
- N — NOUVEAU / NEW
- ÉQUIPEMENT EXISTANT À ENLEVER / EXISTING EQUIPMENT TO BE REMOVED
- EE — EXISTANT À ENLEVER / EXISTING TO BE REMOVED
- EC — EXISTANT À CONSERVER / EXISTING TO REMAIN
- EAR — EXISTANT À RELOCALISER / EXISTING TO BE RELOCATED
- ER — EXISTANT RELOCALISÉ / EXISTING RELOCATED

VENTILATION / VENTILATION

- CONDUIT / DUCT
- CONDUIT EXISTANT À CONSERVER / EXISTING DUCT TO REMAIN
- CONDUIT / ÉQUIPEMENT EXISTANT À ENLEVER / CONDUIT / EXISTING EQUIPMENT TO REMOVE
- RACCORD FLEXIBLE / FLEXIBLE CONNECTION
- M — REGISTRE MOTORISÉ À LAMES PARALLÈLES / PARALLEL BLADE MOTORIZED DAMPER
- P/A — PORTE D'ACCÈS / ACCESS DOOR
- R — POINT DE RACCORDEMENT / CONNECTION POINT
- D — POINT DE DÉBUT OU FIN DE DÉMOLITION / POINT OF START OR END OF DEMOLITION
- N — NOUVEAU / NEW
- ÉQUIPEMENT EXISTANT À ENLEVER / EXISTING EQUIPMENT TO BE REMOVED
- EE — EXISTANT À ENLEVER / EXISTING TO BE REMOVED
- EC — EXISTANT À CONSERVER / EXISTING TO REMAIN
- EAR — EXISTANT À RELOCALISER / EXISTING TO BE RELOCATED
- ER — EXISTANT RELOCALISÉ / EXISTING RELOCATED
- EA — ENTRÉE ANALOGIQUE
- SA — SORTIE ANALOGIQUE
- EB — ENTRÉE BINAIRE
- SB — SORTIE BINAIRE
- RC — TRANSMETTEUR DU COURANT



1 / M01 — PLAN SITE / SITE MAP
ÉCHELLE/SCALE: AUCUNE / NTS

LISTE DES PLANS/ DRAWING LIST

M01	LÉGENDE ET LISTE DES PLANS/ LEGEND ANS DRAWING LIST
M02	SALLE MÉCANIQUE NIVEAU 3 PLOMBERIE–DÉMOLITION ET NOUVEL AMÉNAGEMENT/ MECHANICAL ROOM LEVEL 3 PLUMBING DEMOLITION AND NEW
M03	SALLE MÉCANIQUE NIVEAU 3 PLOMBERIE–DÉMOLITION ET NOUVEL AMÉNAGEMENT/ MECHANICAL ROOM LEVEL 3 PLUMBING DEMOLITION AND NEW
M04	ÉLÉVATION DÉMOLITION ET NOUVEL AMÉNAGEMENT/ ELEVATION DEMOLITION AND NEW

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SCEAU / SEAL:

CLIENT / CLIENT:

Agriculture et Agroalimentaire Canada (AAC)

RÉF. CLIENT / CLIENT REF. # 532971

PROJET / PROJECT:
Remplacement de tours d'eau
Centre de recherche et de développement de St-Jean-sur-Richelieu/
Replacement of cooling tower for Research and Development Center
St-Jean -sur-Richelieu

PLAN CLÉ / KEY PLAN:

ÉMISSION - RÉVISION / ISSUED FOR - REVISION:

ÉM./IS.	RV./RV.	DATE / DATE	DESCRIPTION / DESCRIPTION
A		19–08–20	ÉMIS POUR SOUMISSIONS/ISSUED FOR TENDER

NO PROJET / PROJECT NO: 191–08126–00	DATE / DATE: 2019–06–26
ÉCHELLE ORIGINALE / ORIGINAL SCALE: AUCUNE	SI CETTE BARRE NE MESURE PAS 25 mm, AJUSTER VOTRE ÉCHELLE DE TRAÇAGE. IF THIS BAR IS NOT 25 mm LONG, ADJUST YOUR PLOTTING SCALE. 25 mm
PRÉPARÉ PAR / PREPARE BY: NICOLAS BÉLANGER, ing.	
MODIFIÉ PAR / MODIFIED BY: Y. SARBEVA	
ASSISTÉ DE / ASSISTED BY: Y. SARBEVA	
DESSINÉ PAR / DRAWN BY: J.–C. MOLINA	

DISCIPLINE / DISCIPLINE:
BÂTIMENT: MÉCANIQUE / BUILDING: MECHANICAL

TITRE / TITLE:
LÉGENDE ET LISTE DES PLANS/ LEGEND ANS DRAWING LIST

NUMÉRO DU FEUILLET / SHEET NUMBER:
M01
FEUILLET # / SHEET #: 1 DE / OF 4

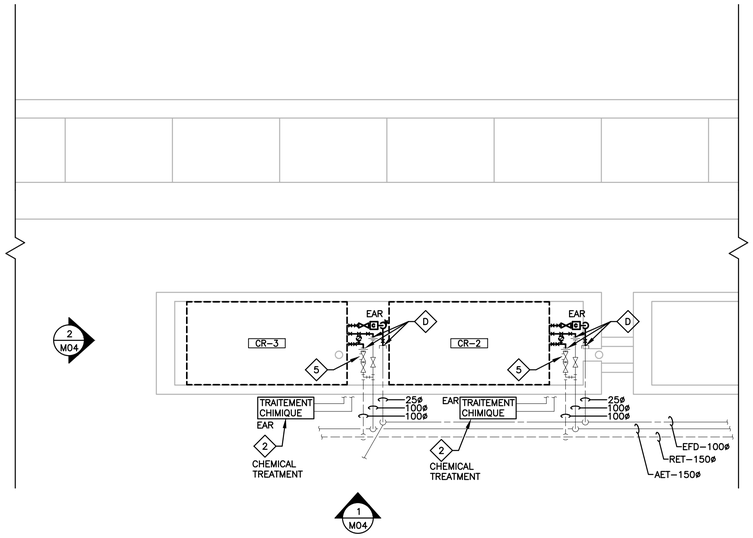
ÉMISSION / ISSUE:
ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER
EN DATE DU / DATE OF: **19-08-19**
RV./RV. #: 0

TABLEAU DE TOUR D'EAU / SCHEDULE OF WATER TOWER

Description/ Description	Manufacture / Manufacturer	Model	Débit d'eau/ Water flow	Température de l'eau a l'entre/ Water temperature at the entrance	Température de l'eau à la sortie/ Exit water temperature	Température de l'air ambiant bulbe humide/ Ambient air temperature wet bulb	Nombre de moteur ventilateur et puissance/ Number of motor fan and power	Pression statique externe/ External static pressure	Nombre de moteur de pompe et puissance/ Number of pump motor and power	Caractéristiques électriques/ Electrical Specifications	Élément chauffant de bassin/ Heating element basin	Perte de pression à travers le serpentin/ Loss of pressure through the coil	Poids approximatif à l'expédition/Approximate weight on shipment
			l/s	C	C	C	kW	kPa	kW	v/ph/hz	kW	kPa	kg
Tour d'eau circuit ferme/ Closed circuit water tower	BAC	VF1-27-21K	8.07	38.9	31.7	22.8	(1)11	0.124	(1) 0.55	575/3/60	(1) 3	8.07	1,701

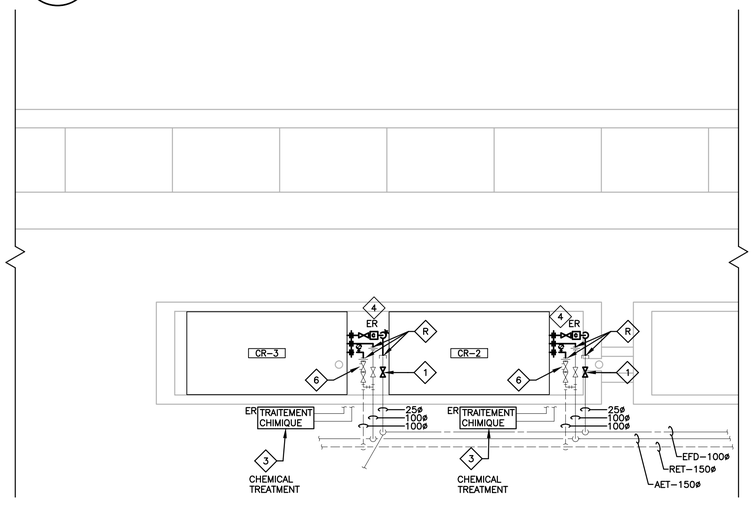
Note.

1- Section de ventilateur fermé pour installation à l'intérieur./ Fan section closed for indoor installation.
2- Le panneau de control avec VFD et contacteur(s) pour élément chauffant et pompe des gicleurs fournie par manufacturer de la tour d'eau et installé par contacteur électrique./
3- The control panel with VFD and contactor (s) for heating element and sprinkler pump supplied by manufacture of the water tower and installed by electrical contactor.



1 M02 SALLE MÉCANIQUE–NIVEAU 3–PLOMBERIE–DÉMOLITION / MECHANICAL ROOM–LEVEL 3–PLUMBING–DEMOLITION

ÉCHELLE/SCALE: 1:50



2 M02 SALLE MÉCANIQUE–NIVEAU 3–PLOMBERIE–NOUVEL AMÉNAGEMENT / MECHANICAL ROOM–LEVEL 3–PLUMBING–NEW

ÉCHELLE/SCALE: 1:50

NOTES GÉNÉRALES/ GENERAL NOTES :

1– LE DÉMANTÈLEMENT ET L'INSTALLATION DES TOURS D'EAU DEVRA SE FAIRE EN SÉQUENCE, I.E. QU'UNE TOUR D'EAU DEVRA ÊTRE PLEINEMENT FONCTIONNELLE AVANT DE NE POUVOIR COMMENCER LES TRAVAUX SUR UNE AUTRE. /
THE DISMANTLING AND INSTALLATION OF THE COOLING TOWER MUST BE DONE IN SEQUENCE I.E. ONE COOLING TOWER MUST BE FULLY FUNCTIONAL BEFORE BEGINNING WORK ON THE OTHER COOLING TOWER.

2– LA TOUR D'EAU CR–3 DOIT ÊTRE DÉMOLI ET INSTALLER EN PREMIER. UNE FOIS, APRÈS LA MISE EN MARCHE DE LA TOUR D'EAU CR–3 LES TRAVAUX ET L'INSTALLATION DE LA TOUR D'EAU CR–2 PEUVENT DÉBUTER. /
FIRST THE COOLING TOWER MUST BE DEMOLISHED AND INSTALLED. ONCE, AFTER THE START UP OF THE COOLING TOWER CR–3, THE WORK TO DISMANTLE AND INSTALL THE COOLING TOWER CR–2 CAN BEGIN.

NOTES / NOTES :

1 AVANT DE COMMENCER LES TRAVAUX, FOURNIR ET INSTALLER UN ROBINET D'ISOLEMENT SUR LA TUYAUTERIE D'EAU FROIDE SOUS PRESSION « HOT TOP ». /
BEFORE BEGINNING WORK, SUPPLY AND CONNECT AN ISOLATING FAUCET ON THE COLD WATER PIPING UNDER PRESSURE "HOT TOP"

2 PENDANT LES TRAVAUX, LE SYSTÈME DU TRAITEMENT CHIMIQUE DOIT ÊTRE DÉBRANCHER ET DÉPLACER DE FAÇON SÉCURITAIRE DURANT LES TRAVAUX D'INSTALLATION DE LA TOUR D'EAU. /
DURING WORK, THE CHEMICAL TREATMENT SYSTEM MUST BE DISCONNECTED AND CAREFULLY REMOVED AND PROTECTED DURING THE WORK TO INSTALL THE NEW COOLING TOWERS.

3 RACCORDER LE SYSTÈME DU TRAITEMENT CHIMIQUE VERS LE NOUVEAU SYSTÈME DE LA TOUR D'EAU. /
CONNECT THE CHEMICAL TREATMENT SYSTEM TO THE NEW COOLING SYSTEM TOWER SYSTEM.

4 LE COMPTEUR D'EAU DOIT ÊTRE DÉBRANCHÉ ET REBRANCHÉ AU MÊME ENDROIT. /
THE WATER METER MUST BE DISCONNECT AND RECONNECT AT THE SAME LOCATION.

5 AVANT DE DÉBUTER LES TRAVAUX, PRENDRE UNE LECTURE DU DÉBIT DU FLUIDE D'ALIMENTATION. /
BEFORE STARTING WORK, TAKE FLUID FLUID FLOW CONTROL.

6 À LA FIN DES TRAVAUX PRENDRE UNE LECTURE DU DÉBIT DE FLUIDE ET L'AJUSTER TEL QUE L'EXISTANT./
AT THE END OF THE WORK TAKE A FLUID FLOW AND ADJUST AS THE EXISTANT.

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RÉF. CLIENT / CLIENT REF. # 532971

PROJET / PROJECT:

Remplacement de tours d'eau
Centre de recherche et de développement de St-Jean-sur-Richelieu/
Replacement of cooling tower for Research and Development Center
St-Jean -sur-Richelieu

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NO PROJET / PROJECT NO: 191–08126–00

DATE / DATE: 2019–06–26

ÉCHELLE ORIGINALE / ORIGINAL SCALE: INDIQUÉE

SI CETTE BARRE NE MESURE PAS 25 mm, AJUSTER VOTRE ÉCHELLE DE TRAÇAGE.
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25 mm

PRÉPARÉ PAR / PREPARE BY: NICOLAS BÉLANGER, ing.

MODIFIÉ PAR / MODIFIED BY: Y. SARBEVA

ASSISTÉ DE / ASSISTED BY: Y. SARBEVA

DESSINÉ PAR / DRAWN BY: J.–C. MOLINA

DISCIPLINE / DISCIPLINE: **BÂTIMENT: MÉCANIQUE / BUILDING: MECHANICAL**

TITRE / TITLE:

SALLE MÉCANIQUE NIVEAU 3
PLOMBERIE-DÉMOLITION ET NOUVEL AMÉNAGEMENT/
MECHANICAL ROOM LEVEL 3
PLUMBING DEMOLITION AND NEW

NUMÉRO DU FEUILLET / SHEET NUMBER: **M02**

FEUILLET # / SHEET #: 2 DE / OF 4

EMISSION / ISSUE: ÉMIS POUR SOUMISSIONS/ISSUED FOR TENDER
EN DATE DU / DATE OF: 19-08-07

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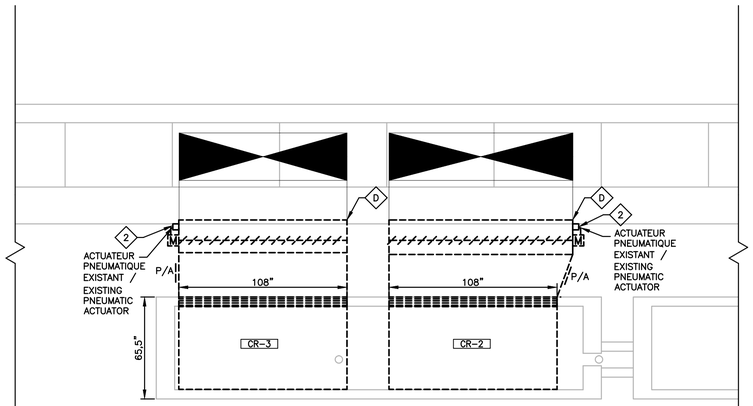
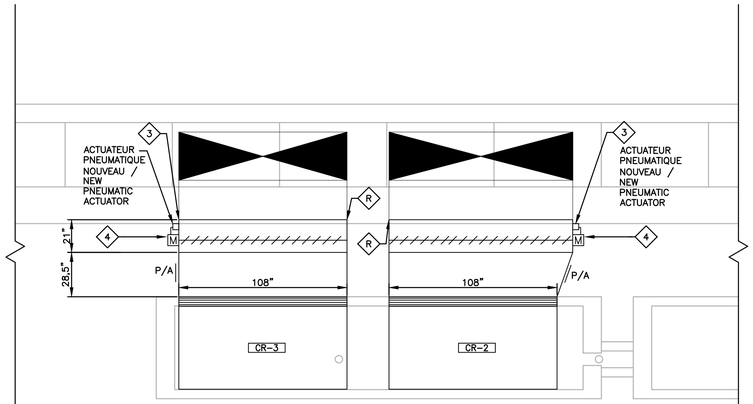


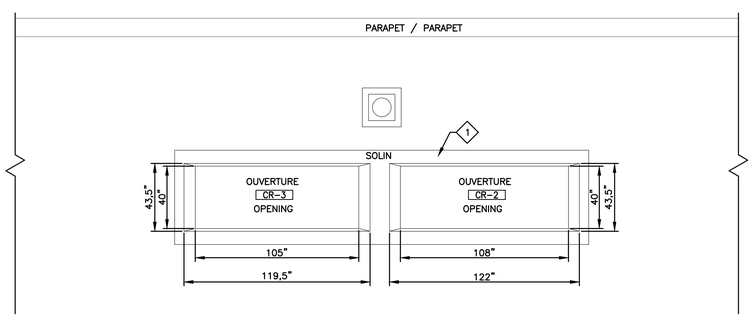
1 M03 SALLE MÉCANIQUE–NIVEAU 3–VENTILATION–DÉMOLITION / MECHANICAL ROOM–LEVEL 3–VENTILATION–DEMOLITION

ÉCHELLE/SCALE: 1:50



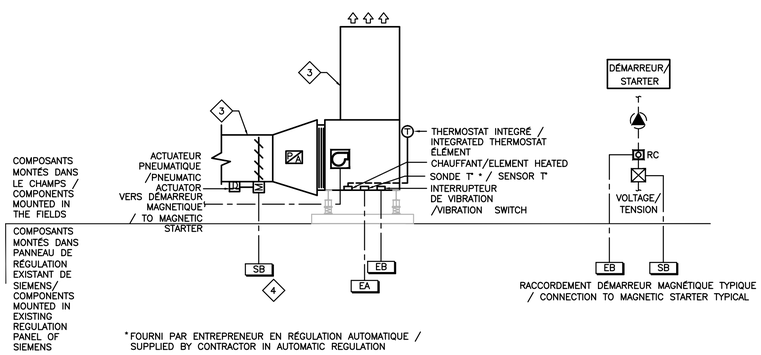
2 M03 SALLE MÉCANIQUE–NIVEAU 3–VENTILATION–NOUVEL AMÉNAGEMENT / MECHANICAL ROOM–LEVEL 3–VENTILATION–NEW

ÉCHELLE/SCALE: 1:50



3 M03 TOIT / ROOF

ÉCHELLE/SCALE: 1:50



4 M03 CONTRÔLE / CONTROL

ÉCHELLE/SCALE: AUCUNE / NTS

CES DOCUMENTS NE DOIVENT PAS ÊTRE UTILISÉS À DES FINS DE CONSTRUCTION (OU DE FABRICATION).

THESE DOCUMENTS MUST NOT USED FOR CONSTRUCTION (OR FABRICATION).

NOTES GÉNÉRALES/ GENERAL NOTES :

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NOTES / NOTES :

1 ENLEVER LE SOLIN EXISTANT AUTOUR DES OUVERTURES AU TOIT AU BESOIN ET LE RÉINSTALLER APRÈS LA MISE EN PLACE DES ÉQUIPEMENTS. LES TRAVAUX DE SOLIN DOIVENT ETRE EXÉCUTÉS PAR UN ENTREPRENEUR SPÉCIALISÉ EN TOITURE. /
REMOVE EXISTING FLASHING AROUND THE OPENINGS ON THE ROOF IF NEEDED AND REINSTALL AFTER THE REPLACEMENT OF THE EQUIPMENT. FLASHING MUST BE EXECUTED BY A SPECIALIZED ROOFING CONTRACTOR.

2 AVANT DE DÉBUTER LES TRAVAUX PRENDRE UNE LECTURE DU DÉBIT D'AIR DU SYSTÈME EXISTANT. / BEFORE STARTING WORK TAKE AN AIR FLOW OF THE EXISTING SYSTEM.

3 À LA FIN DU TRAVAUX PRENDRE UNE LECTURE DU DÉBIT D'AIR ET L'AJUSTER TEL QU'EXISTANT / AT THE END OF THE WORK TAKE A FLOW OF THE FLOW OF AIR AND ADJUST IT AS EXISTING.

4 RACCORDER L'ACTUATEUR AU SYSTÈME DE CONTRÔLE EXISTANT / CONNECT THE ACTUATOR TO THE EXISTING CONTROL SYSTEM

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SCEAU / SEAL:

INGÉNIEUR Nicolas Bélanger 199114 QUÉBEC

CLIENT / CLIENT:

Agriculture et Agroalimentaire Canada (AAC)

RÉF. CLIENT / CLIENT REF. #: 532971

PROJET / PROJECT:

Remplacement de tours d'eau Centre de recherche et de développement de St-Jean-sur-Richelieu/ Replacement of cooling tower for Research and Development Center St-Jean -sur-Richelieu

PLAN CLÉ / KEY PLAN:

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DATE / DATE: 2019–06–26

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25 mm

PRÉPARÉ PAR / PREPARE BY: NICOLAS BÉLANGER, ing.

MODIFIÉ PAR / MODIFIED BY: Y. SARBEVA

ASSISTÉ DE / ASSISTED BY: Y. SARBEVA

DESSINÉ PAR / DRAWN BY: J.–C. MOLINA

DISCIPLINE / DISCIPLINE: BÂTIMENT: MÉCANIQUE / BUILDING: MECHANICAL

TITRE / TITLE:

SALLE MÉCANIQUE NIVEAU 3 VENTILATION DÉMOLITION ET NOUVEL AMÉNAGEMENT-PLAN TOIT-CONTRÔLE/ MECHANICAL ROOM LEVEL 3 VENTILATION DEMOLITION AND NEW-ROOF-CONTROL

NUMÉRO DU FEUILLET / SHEET NUMBER: **M03**

FEUILLET # / SHEET #: 3 DE / OF 4

ÉMISSION / ISSUE: ÉMIS POUR SOUMISSIONS/ISSUED FOR TENDER

RV./RV. #: 0

EN DATE DU / DATE OF: 19-08-07

NOTES GÉNÉRALES / GÉNÉRAL NOTES :

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NOTES / NOTES :

1. LA PARTIE BASSE DE LA TOUR D'EAU DOIT ÊTRE ASSEMBLÉ SUR PLACE. / THE LOWER PART OF THE WATER TOWER MUST BE ASSEMBLED ON THE PLACE.
2. LA POMPE EST FOURNI PAR LE MANUFACTURIER ET INSTALLER PAR L'ENTREPRENEUR EN PLOMBERIE DE LA TOUR D'EAU./ THE PUMP IS SUPPLIED BY THE MANUFACTURER AND INSTALLED BY THE PLUMBING CONTRACTOR OF THE COOLING TOWER.
3. L'ENTREPRENEUR DEVRA REFAIRE L'ÉTANCHÉITÉ À LA DÉCHARGE À LA TOUR D'EAU TEL QUE L'INSTALLATION EXISTANTE AVEC L'ENVELOPPE DU BÂTIMENT PAR ENTREPRENEUR EN TOITURE./ THE CONTRACTOR MUST REDO THE SEALING OF DISCHARGE OF THE COOLING TOWER AS PER THE EXISTING INSTALLATION OF THE BUILDING ENVELOPE BY ROOF CONTRACTOR.
4. L'ENTREPRENEUR DEVRA ENLEVER ET REFAIRE LE CAILLEBOTIS POUR PERMETTRE L'INSTALLATION DE LA TOUR D'EAU./ THE CONTRACTOR MUST REMOVE AND REDO THE GRATING TO PERMIT THE INSTALLATION OF THE COOLING TOWER.

CES DOCUMENTS NE DOIVENT PAS ÊTRE UTILISÉS À DES FINS DE CONSTRUCTION (OU DE FABRICATION).

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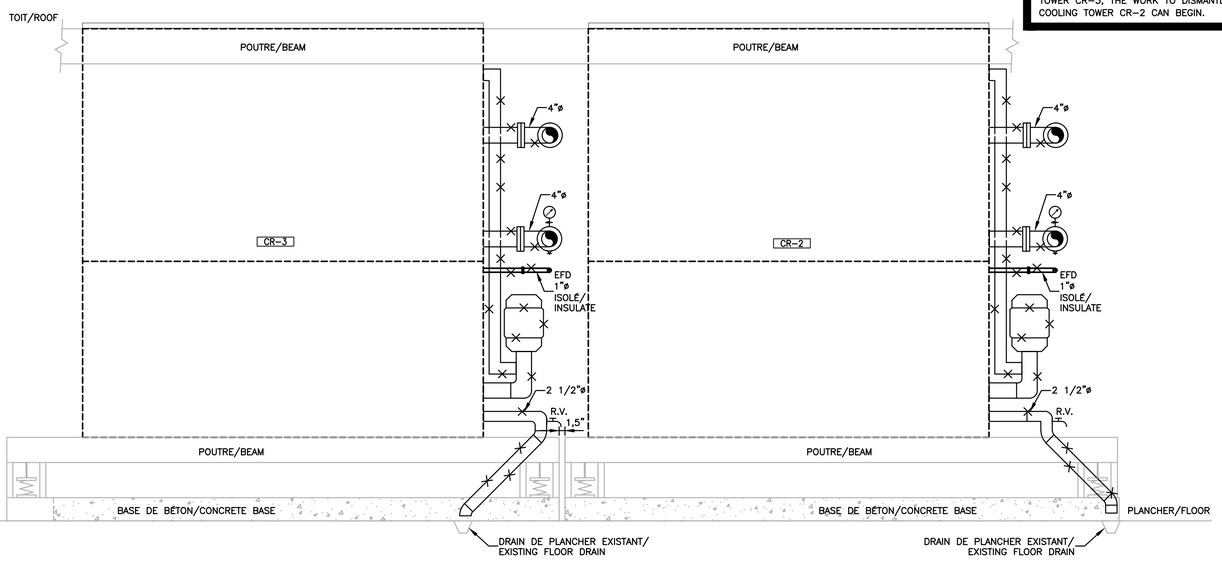
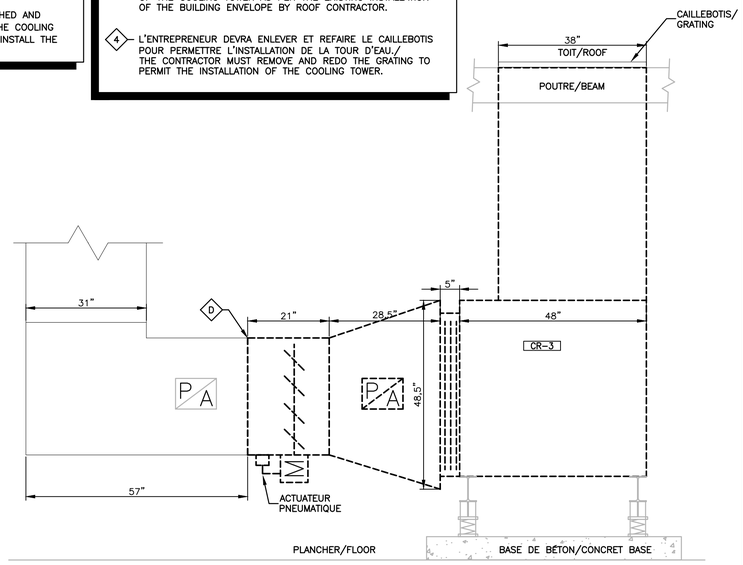


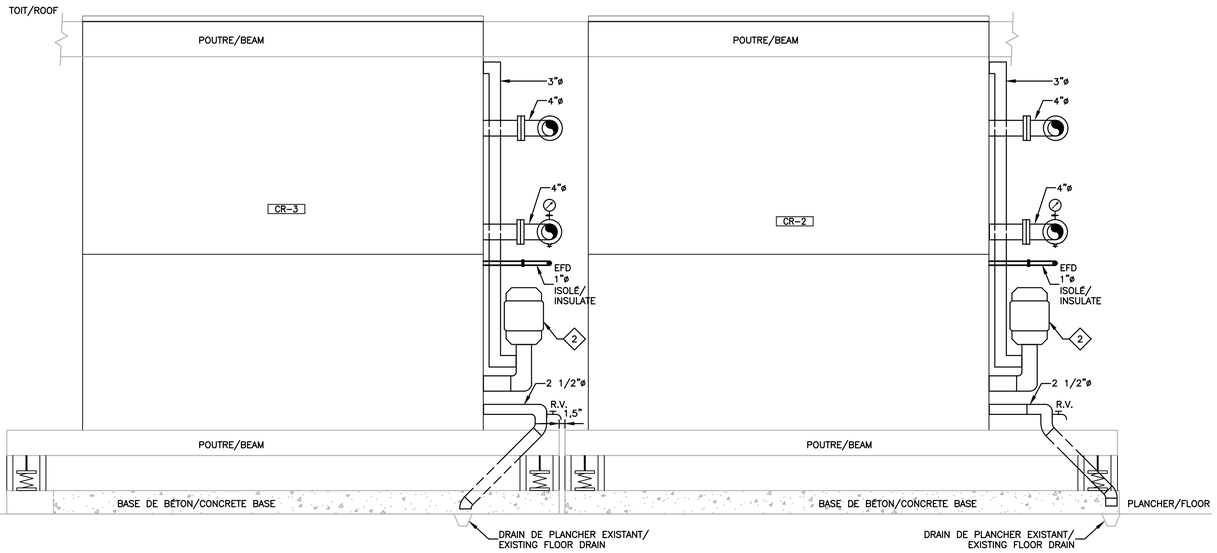
1 M04 SALLE MÉCANIQUE–NIVEAU 3–ÉLÉVATION–DÉMOLITION / MECHANICAL ROOM–LEVEL 3–ELEVATION–DEMOLITION

ÉCHELLE/SCALE: 1:20



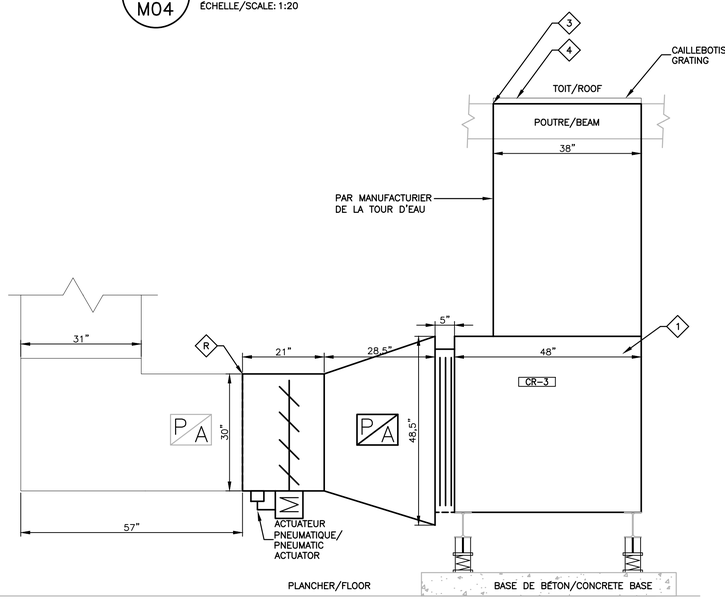
2 M04 ÉLÉVATIONS–DÉMOLITION/ ELEVATION–DEMOLITION

ÉCHELLE/SCALE: 1:20



3 M04 SALLE MÉCANIQUE–NIVEAU 3–ÉLÉVATION–NOUVEL AMÉNAGEMENT / MECHANICAL ROOM–LEVEL 3–ELEVATION–NEW

ÉCHELLE/SCALE: 1:20



4 M04 ÉLÉVATIONS–NOUVEAU/ ELEVATION–NEW

ÉCHELLE/SCALE: 1:20

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SCEAU / SEAL:

INGÉNIEUR
Nicolas Bélanger
191811
QUÉBEC

CLIENT / CLIENT:

Agriculture et Agroalimentaire Canada (AAC)

RÉF. CLIENT / CLIENT REF. #: 532971

PROJET / PROJECT:

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PRÉPARÉ PAR / PREPARE BY: NICOLAS BÉLANGER, ing.	25 mm
MODIFIÉ PAR / MODIFIED BY: Y. SARBEVA	
ASSISTÉ DE / ASSISTED BY: Y. SARBEVA	
DESSINÉ PAR / DRAWN BY: J.–C. MOLINA	

DISCIPLINE / DISCIPLINE:
BÂTIMENT: MÉCANIQUE / BUILDING: MECHANICAL

TITRE / TITLE:

ÉLÉVATION DÉMOLITION ET NOUVEL AMÉNAGEMENT/
ELEVATION DEMOLITION AND NEW

NUMÉRO DU FEUILLET / SHEET NUMBER:
M04

FEUILLET # / SHEET #: 4 DE / OF 4

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REMPLACEMENT DE TOURS D'EAU
CENTRE DE RECHERCHE ET DE DÉVELOPPEMENT ST-JEAN-SUR-RICHELIEU/
REPLACEMENT OF COOLING TOWER FOR RESEARCH AND DEVELOPMENT CENTER ST-JEAN -SUR-RICHELIEU

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ELECTRICAL LEGEND

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- SM — SÉCHOIR À MAINS / HAND DRYER
- POSTE DE COMMANDE À BOUTON–POUSSOIRS / PUSH BUTTON CONTROL
- (R) — RELAIS DE CONTRÔLE / CONTROL RELAY
- C — COLONNETTE DE SERVICE / SERVICE POLE
- BOUTON–POUSSOIR / PUSH BUTTON
- C — CARILLON DE PORTE / DOOR CHIME
- VENTILATEUR DE PLAFOND / CEILING FAN
- BOÎTE DE VENTILATION PAR DIV. 15, À RACCORDER PAR DIV. 16 / V.A.V. BOX BY DIV. 15, CONNECTED BY DIV. 16
- VM — VOLET MOTORISÉ PAR DIV. 15, À RACCORDER PAR DIV. 16 / MOTORISED DAMPER BY DIV. 15, CONNECTED BY DIV. 16
- CONTACTEUR MAGNÉTIQUE / MAGNETIC CONTACT
- DÉMARREUR MANUEL / MANUAL STARTER
- DÉMARREUR MAGNÉTIQUE / MAGNETIC STARTER
- DÉMARREUR MAGNÉTIQUE DU TYPE COMBINÉ À DISJONCTEUR / COMBINATION MAGNETIC STARTER WITH DISCONNECT
- SECTIONNEUR DE CAPACITÉ INDIQUÉE, AVEC OU SANS FUSIBLES / FUSED OR UNFUSED DISCONNECT SWITCH
- Tx — TRANSFORMATEUR / TRANSFORMER
- PANNEAU D'ÉCLAIRAGE 120/240 V OU 120/208 V EN SURFACE / SURFACE MOUNTED DISTRIBUTION PANEL, 120/240 V OR 120/208 V
- PANNEAU D'ÉCLAIRAGE 120/240 V OU 120/208 V ENCASTRÉ / RECESSED DISTRIBUTION PANEL, 120/240 V OR 120/208 V
- PANNEAU D'URGENCE/DISTRIBUTION 347/600 V EN SURFACE / SURFACE MOUNTED EMERGENCY DISTRIBUTION PANEL, 347/600 V
- PANNEAU D'URGENCE/DISTRIBUTION 347/600 V ENCASTRÉ / RECESSED EMERGENCY DISTRIBUTION PANEL, 347/600 V
- MOTEUR MONOPHASÉ (HP INDIQUÉ) / SINGLE PHASE MOTOR, (CAPACITY INDICATED)
- MOTEUR TRIPHASÉ (HP INDIQUÉ) / THREE PHASE MOTOR, (CAPACITY INDICATED)
- (H) — HOTTE DE CUISINIÈRE FOURNIE ET INSTALLÉE PAR DIV. 15, RACCORDÉE PAR DIV. 16 / VENTILATION HOOD SUPPLIED AND INSTALLED BY DIV. 15, CONNECTED BY DIV. 16
- INTERRUPTEUR DE TRANSFERT AUTOMATIQUE / AUTOMATIC TRANSFER SWITCH
- BARRE DE MISE À LA TERRE / GROUND BAR
- CHEMIN DE CABLES / CABLE TRAY
- CANALISATION ("BUS DUCT") AVEC SECTIONNEUR ENFICHABLE DU TYPE À FUSIBLES OU À DISJONCTEUR, SELON LES INDICATIONS / BUS DUCT WITH PLUG–IN SWITCH, FUSE OR BREAKER TYPE AS SHOWN
- SM — SÉCHOIR À MAINS / HAND DRYER

APPAREILS D'ÉCLAIRAGE / LIGHTING FIXTURES

- APPAREIL D'ÉCLAIRAGE DE TYPE RÉGLETTE, LONGUEUR SELON LES INDICATIONS / STRIP LIGHTING FIXTURE, LENGHT AS INDICATED

LISTE DES PLANS/ DRAWING LIST

wsp
9160, BOULEVARD LEDUC, BUREAU 210
BROSSARD (QUÉBEC) CANADA J4Y 0E3
TÉL. : 450 679-7220 | TÉLÉC. : 450 670-9076 | WWW.WSPGROUP.COM

CONSULTANT - SOUS-CONSULTANT / CONSULTANT - SUB-CONSULTANT:

SCEAU / SEAL:

INGÉNIEUR Réal Ouimet 383327 QUÉBEC

2019-08-21

CLIENT / CLIENT:

Agriculture et Agroalimentaire Canada (AAC)

RÉF. CLIENT / CLIENT REF. # 532971

PROJET / PROJECT:

Remplacement de tours d'eau Centre de recherche et de développement de St-Jean-sur-Richelieu/ Replacement of cooling tower for Research and Development Center St-Jean -sur-Richelieu

PLAN CLÉ / KEY PLAN:

N

ÉMISSION - RÉVISION / ISSUED FOR - REVISION:

ÉM./IS.	RV./RV.	DATE / DATE	DESCRIPTION / DESCRIPTION
A		19–08–20	ÉMIS POUR SOUMISSIONS/ISSUED FOR TENDER

NO PROJET / PROJECT NO: 191–08126–00

DATE / DATE: 2019–06–26

ÉCHELLE ORIGINALE / ORIGINAL SCALE: AUCUNE

SI CETTE BARRE NE MESURE PAS 25 mm, AJUSTER VOTRE ÉCHELLE DE TRAÇAGE.

IF THIS BAR IS NOT 25 mm LONG, ADJUST YOUR PLOTTING SCALE.

25 mm

PRÉPARÉ PAR / PREPARE BY: RÉAL OUIMET, ing.

MODIFIÉ PAR / MODIFIED BY: RÉAL OUIMET, ing.

ASSISTÉ DE / ASSISTED BY: T. BULMER

DESSINÉ PAR / DRAWN BY: J.–C. MOLINA

DISCIPLINE / DISCIPLINE:
BÂTIMENT : ÉLECTRICITÉ / ELECTRICAL : BUILDING

TITRE / TITLE:

LÉGENDE ET LISTE DES PLANS/ LEGEND AND DRAWING LIST

NUMÉRO DU FEUILLET / SHEET NUMBER:
E01

FEUILLET # / SHEET #: 1 DE / OF 4

ÉMISSION / ISSUE: **ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER**

EN DATE DU / DATE OF: **19-08-20**

RV./RV. #: **0**

NOTES GÉNÉRALES :

1– LE DÉMANTÈLEMENT ET L'INSTALLATION DES TOURS D'EAU DEVRA SE FAIRE EN SÉQUENCE, I.E. QU'UNE TOUR D'EAU DEVRA ÊTRE PLEINEMENT FONCTIONNELLE AVANT DE NE POUVOIR COMMENCER LES TRAVAUX SUR UNE AUTRE.

2– LA TOUR D'EAU CR–3 DOIT ÊTRE DÉMOLI ET INSTALLER EN PREMIER. UNE FOIS, APRÈS LA MISE EN MARCHE DE LA TOUR D'EAU CR–3 LES TRAVAUX ET L'INSTALLATION DE LA TOUR D'EAU CR–2 PEUVENT DÉBUTER.

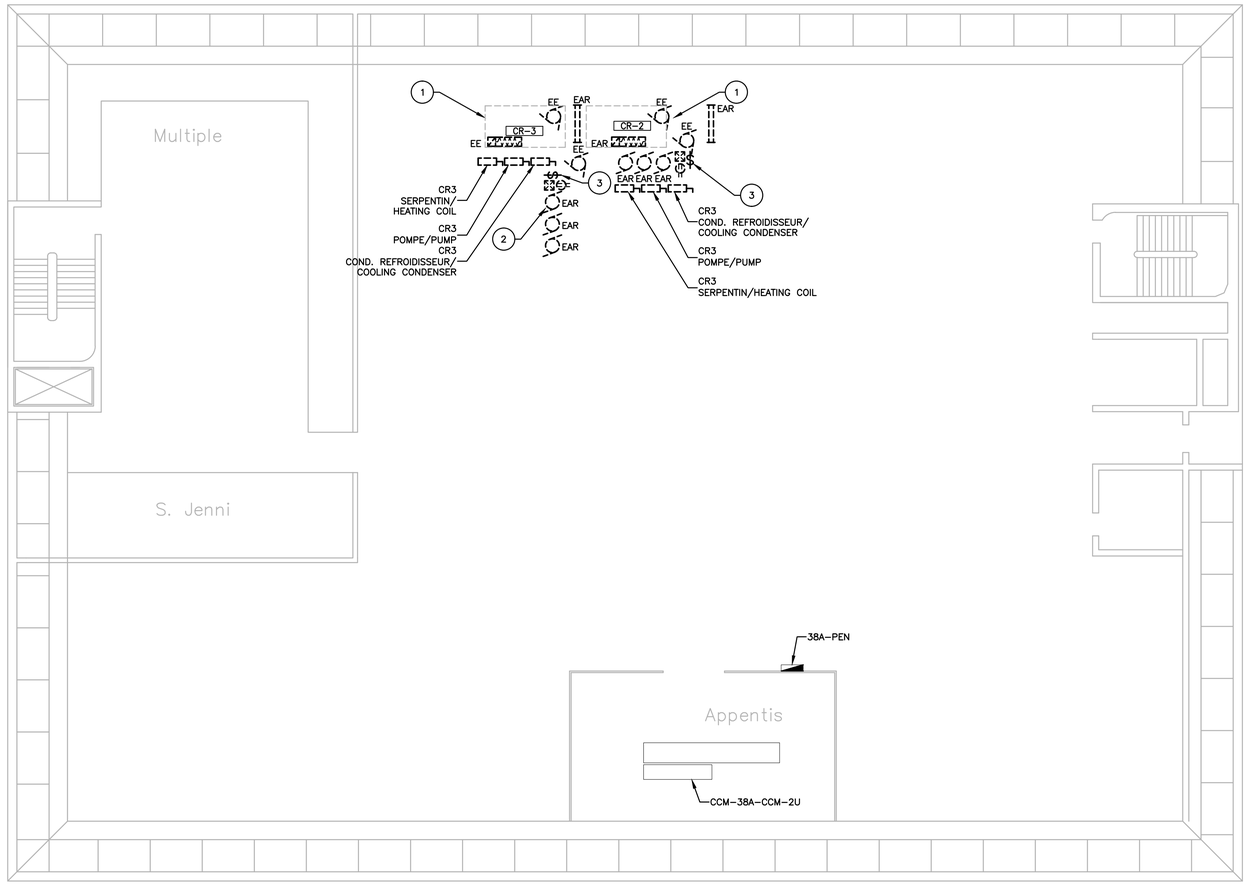
GENERAL NOTES :

1– THE DISMANTLING AND INSTALLATION OF THE COOLING TOWER MUST BE DONE IN SEQUENCE I.E. ONE COOLING TOWER MUST BE FULLY FUNCTIONAL BEFORE BEGINNING WORK ON THE OTHER COOLING TOWER.

2– FIRST THE COOLING TOWER MUST BE DEMOLISHED AND INSTALLED. ONCE, AFTER THE START UP OF THE COOLING TOWER CR–3, THE WORK TO DISMANTLE AND INSTALL THE COOLING TOWER CR–2 CAN BEGIN.

CES DOCUMENTS NE DOIVENT PAS ÊTRE UTILISÉS À DES FINS DE CONSTRUCTION (OU DE FABRICATION).

THESE DOCUMENTS MUST NOT USED FOR CONSTRUCTION (OR FABRICATION).



1 / E02 NIVEAU 3 / LEVEL 3

ÉCHELLE/SCALE: 1:100

NOTES :

1 – ENLEVER LES RACCORDEMENTS DE L'ÉQUIPEMENT JUSQU'AU POINT D'ALIMENTATION COMPLET AVEC LES CONDUITS, LA FILERIE, LES BOÎTES DE JONCTION ET LES ACCESSOIRES. REMPLACER LES CONTACTEURS ET LES CONTRÔLES (COMPLET AVEC SI REQUIS), INTERRUPTEURS, AU CCM POUR LE NOUVEAU RACCORDEMENT CCM GE CR–2000, TYPE B CLASSE 1, 600V, 3PH./
REMOVE THE CONNECTION FOR THE EQUIPMENT BACK TO SOURCE COMPLETE WITH THE CONDUITS, WIRING, JUNCTION BOXES, DISCONNECT SWITCHES AND ACCESSORIES. REPLACE DISCONNECT SWITCH COMPLETE WITH CONTACTORS AND CONTROLS AS REQUIRED IN THE CCM FOR THE NEW CONNECTION. CCM GE. CR–2000, TYPE B, CLASS 1 600V, 3PH.

2 – DÉBRANCHER ET RELOCALISER LES RACCORDEMENTS POUR LES SYSTÈMES DE TRAITEMENT CHIMIQUE POUR LA TOUR D'EAU. CONSERVER LE CIRCUIT POUR LES NOUVEAUX RACCORDEMENTS./
DISCONNECT AND RELOCATE THE CONNECTIONS FOR THE CHEMICAL TREATMENT SYSTEM FOR THE COOLING TOWER. KEEP THE EXISTING CIRCUIT FOR THE NEW CONNECTION.

3 – DÉBRANCHER ET RELOCALISER LE RACCORDEMENT ET L'APPAREIL D'ÉCLAIRAGE POUR LA TOUR D'EAU. CONSERVER LE CIRCUIT POUR LE NOUVEAU RACCORDEMENT./
DISCONNECT AND RELOCATE THE CONNECTION AND LIGHT FIXTURE FOR THE COOLING TOWER. KEEP THE EXISTING CIRCUIT FOR THE NEW CONNECTION.

wsp
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BROSSARD (QUÉBEC) CANADA J4Y 0E3
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CONSULTANT - SOUS-CONSULTANT / CONSULTANT - SUB-CONSULTANT:

SCEAU / SEAL:

INGÉNIEUR Réal Ouimet 383332 QUÉBEC

2019-08-21

CLIENT / CLIENT:

Agriculture et Agroalimentaire Canada (AAC)

RÉF. CLIENT / CLIENT REF. #: 532971

PROJET / PROJECT:

Remplacement de tours d'eau
Centre de recherche et de développement de St-Jean-sur-Richelieu/
Replacement of cooling tower for Research and Development Center St-Jean -sur-Richelieu

PLAN CLÉ / KEY PLAN:

N

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NO PROJET / PROJECT NO: 191–08126–00

DATE / DATE: 2019–06–26

ÉCHELLE ORIGINALE / ORIGINAL SCALE: INDIQUÉE

SI CETTE BARRE NE MESURE PAS 25 mm, AJUSTER VOTRE ÉCHELLE DE TRAÇAGE.
IF THIS BAR IS NOT 25 mm LONG, ADJUST YOUR PLOTTING SCALE.
25 mm

PRÉPARÉ PAR / PREPARE BY: RÉAL OUIMET, ing.

MODIFIÉ PAR / MODIFIED BY: RÉAL OUIMET, ing.

ASSISTÉ DE / ASSISTED BY: T. BULMER

DESSINÉ PAR / DRAWN BY: J.–C. MOLINA

DISCIPLINE / DISCIPLINE: **BÂTIMENT : ÉLECTRICITÉ / ELECTRICAL : BUILDING**

TITRE / TITLE:

SALLE MÉCANIQUE–NIVEAU 3–SERVICES DÉMOLITION/
MECHANICAL ROOM–LEVEL 3–DEMOLITION SERVICES

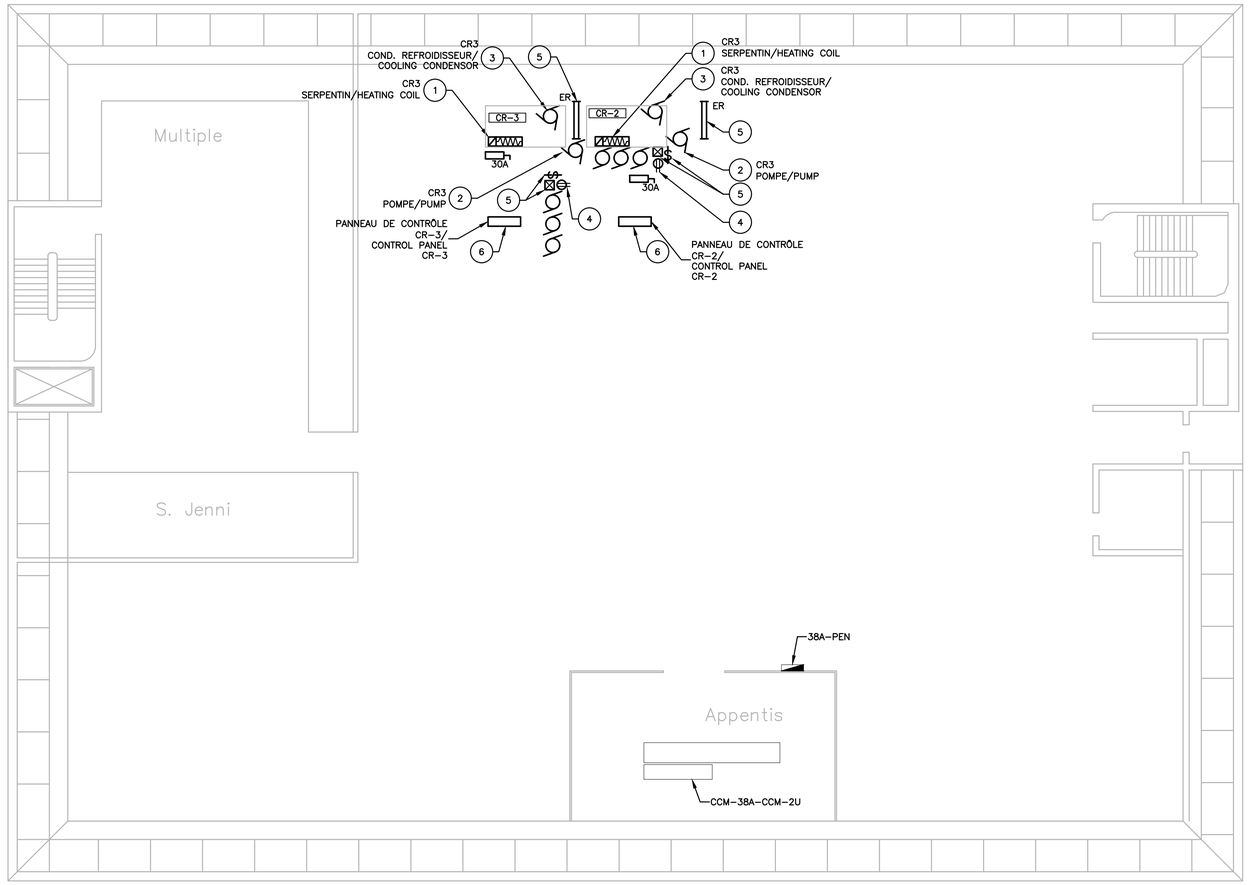
NUMÉRO DU FEUILLET / SHEET NUMBER: **E02**

FEUILLET # / SHEET #: 2 DE / OF 4

ÉMISSION / ISSUE: **ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER**

EN DATE DU / DATE OF: **19-08-20**

RV./RV. #: **0**



1 / E03 NIVEAU 3 / LEVEL 3

ÉCHELLE/SCALE: 1:100

CES DOCUMENTS NE DOIVENT PAS ÊTRE UTILISÉS À DES FINS DE CONSTRUCTION (OU DE FABRICATION).

THESE DOCUMENTS MUST NOT USED FOR CONSTRUCTION (OR FABRICATION).

NOTES :

1. FOURNIR ET INSTALLER UNE NOUVELLE ALIMENTATION POUR LE SERPENTIN DE LA TOUR D'EAU. RACCORDER AU NOUVEAU PANNEAU DE CONTRÔLE POUR LA TOUR D'EAU AVEC 3#12, 1#12V. C.21mm./
SUPPLY AND INSTALL A NEW FEED FOR THE HEATING COIL FOR THE COOLING TOWER. CONNECT TO THE NEW CONTROL PANEL WITH 3#12, 1#12V C.21mm

2. FOURNIR ET INSTALLER UNE NOUVELLE ALIMENTATION POUR LA POMPE DE LA TOUR D'EAU. RACCORDER AU NOUVEAU PANNEAU DE CONTRÔLE AVEC 3#12, 1#12V C.21mm. /
SUPPLY AND INSTALL A NEW FEED FOR THE PUMP FOR THE COOLING TOWER. CONNECT TO THE NEW CONTROL PANEL WITH 3#12, 1#12V C.21mm.

3. FOURNIR ET INSTALLER UNE NOUVELLE ALIMENTATION POUR LE CONDENSEUR REFROIDISSEUR DE LA TOUR D'EAU. RACCORDER AU NOUVEAU PANNEAU DE CONTRÔLE AVEC 3#8, 1#8V C.21mm./
SUPPLY AND INSTALL A NEW FEED FOR THE CONDENSOR FOR THE COOLING TOWER. CONNECT TO NEW CONTROL PANEL WITH 3#8, 1#8V C.21mm.

4. FOURNIR ET INSTALLER UNE NOUVELLE PRISE DE COURANT 15A, 120V, 1 PÔLE POUR LE SYSTÈME DE TRAITEMENT CHIMIQUE DE LA TOUR D'EAU. RACCORDER AU PANNEAU 38A–PEN CIRCUIT 7./
PROVIDE AND INSTALL A NEW 15A, 120V, 1 PÔLE RECEPTACLE FOR THE CHEMICAL TREATEMENT SYSTEM FOR THE COOLING TOWER. CONNECT TO PANEL 38A–PEN CIRCUIT 7.

5. FOURNIR ET INSTALLER UN RACCORDEMENT POUR L'ÉCLAIRAGE EXISTANT RELOCALISÉ, COMPLET AVEC UNE BOÎTE DE JONCTION ET UN INTERRUPTEUR D'ÉCLAIRAGE 15A, 120V, 1 PÔLE./
SUPPLY AND INSTALL A CONNECTION FOR THE EXISTING RELOCATED LIGHT FIXTURE. COMPLETE WITH A JUNCTION BOX AND LIGHT SWITCH 15A, 120V, 1 PÔLE.

6. FOURNIR ET INSTALLER UN RACCORDEMENT POUR LE PANNEAU DE CONTRÔLE DE LA TOUR D'EAU. RACCORDER AU CENTRE DE CONTRÔLE DES MOTEURS EXISTANTS AVEC 3#8+1#8V. C. 21mm. SUR UN NOUVEL INTERRUPTEUR À FUSIBLE 30A, AVEC FUSIBLES 30A./
SUPPLY AND INSTALL A CONNECTION FOR THE CONTROL PANEL FOR THE COOLING TOWER. CONNECT TO THE EXISTING MOTOR CONTROL CENTER WITH 3#8+1#8V. 21mm C. ON A NEW FUSIBLE 30A DISCONNECT SWITCH WITH 30A RATED FUSES .

NOTES GÉNÉRALES :

1– LE DÉMANTÈLEMENT ET L'INSTALLATION DES TOURS D'EAU DEVRA SE FAIRE EN SÉQUENCE, I.E. QU'UNE TOUR D'EAU DEVRA ÊTRE PLEINEMENT FONCTIONNELLE AVANT DE NE POUVOIR COMMENCER LES TRAVAUX SUR UNE AUTRE.

2– LA TOUR D'EAU CR–3 DOIT ÊTRE DÉMOLI ET INSTALLER EN PREMIER. UNE FOIS, APRÈS LA MISE EN MARCHE DE LA TOUR D'EAU CR–3 LES TRAVAUX ET L'INSTALLATION DE LA TOUR D'EAU CR–2 PEUVENT DÉBUTER.

GENERAL NOTES :

1– THE DISMANTLING AND INSTALLATION OF THE COOLING TOWER MUST BE DONE IN SEQUENCE I.E. ONE COOLING TOWER MUST BE FULLY FUNCTIONAL BEFORE BEGINNING WORK ON THE OTHER COOLING TOWER.

2– FIRST THE COOLING TOWER MUST BE DEMOLISHED AND INSTALLED. ONCE, AFTER THE START UP OF THE COOLING TOWER CR–3, THE WORK TO DISMANTLE AND INSTALL THE COOLING TOWER CR–2 CAN BEGIN.

wsp
9160, BOULEVARD LEDUC, BUREAU 210
BROSSARD (QUÉBEC) CANADA J4Y 0E3
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CONSULTANT - SOUS-CONSULTANT / CONSULTANT - SUB-CONSULTANT:

SCEAU / SEAL:

INGÉNIEUR Réal Ouimet 383332 QUÉBEC

2019-08-21

CLIENT / CLIENT:

Agriculture et Agroalimentaire Canada (AAC)

RÉF. CLIENT / CLIENT REF.: 532971

PROJET / PROJECT:

Remplacement de tours d'eau
Centre de recherche et de développement de St-Jean-sur-Richelieu/
Replacement of cooling tower for Research and Development Center
St-Jean -sur-Richelieu

PLAN CLÉ / KEY PLAN:

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NO PROJET / PROJECT NO: 191–08126–00	DATE / DATE: 2019–06–26
ÉCHELLE ORIGINALE / ORIGINAL SCALE: INDIQUÉE	SI CETTE BARRE NE MESURE PAS 25 mm, AJUSTER VOTRE ÉCHELLE DE TRAÇAGE. IF THIS BAR IS NOT 25 mm LONG, ADJUST YOUR PLOTTING SCALE. 25 mm
PRÉPARÉ PAR / PREPARE BY: RÉAL OUIMET, ing.	
MODIFIÉ PAR / MODIFIED BY: RÉAL OUIMET, ing.	
ASSISTÉ DE / ASSISTED BY: T. BULMER	
DESSINÉ PAR / DRAWN BY: J.–C. MOLINA	

DISCIPLINE / DISCIPLINE:
BÂTIMENT : ÉLECTRICITÉ / ELECTRICAL : BUILDING

TITRE / TITLE:

SALLE MÉCANIQUE NIVEAU 3 SERVICES NOUVEL AMÉNAGEMENT/
MECHANICAL ROOM-LEVEL 3-NEW SERVICES

NUMÉRO DU FEUILLET / SHEET NUMBER:
E03

FEUILLET # / SHEET #: 3 DE / OF 4

ÉMISSION / ISSUE: ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER
EN DATE DU / DATE OF: 19-08-20
RV./RV. #: 0

EXISTANT

PAN–38A–PEN

120/208 VOLTS, 3ø, 4F
CHARGE RACCORDÉE: ..... ENCASTRÉ ☐
CAPACITÉ DES BARRES: ..... AMPS SURFACE ☐

DESCRIPTION	WATT	A	No		No	A	WATT	DESCRIPTION
HOTTE VH–22	·	15	1		2	30	·	VE–3
VE–7		15	3		4	15		VE–2
CR2 ET CR3		15	5		6	15		HOTTE VH–9
VE–4		15	7		8	15		PR FAMDOCK
VE–11		15	9		10	15		VE–6
VH–18		15	11		12	15		VE–20
PR CAGE CONCIERGE		15	13		14	15		HOTTE VH–16
DÉSHUMIDIFICATEURS		50	15		16	15		VE–1
		2P	17		18	15		PR TOIT
PANNEAU 38APEN–1		40	19		20	15		CLM–PMP–36–P23
			21		22	15		DISTILLEUSE
		3P	23		24	15		AÉROTHERME CÔTÉ EST

NOTES GÉNÉRALES :

1– LE DÉMANTÈLEMENT ET L'INSTALLATION DES TOURS D'EAU DEVRA SE FAIRE EN SÉQUENCE, I.E. QU'UNE TOUR D'EAU DEVRA ÊTRE PLEINEMENT FONCTIONNELLE AVANT DE NE POUVOIR COMMENCER LES TRAVAUX SUR UNE AUTRE.

2– LA TOUR D'EAU CR–3 DOIT ÊTRE DÉMOLI ET INSTALLER EN PREMIER. UNE FOIS, APRÈS LA MISE EN MARCHE DE LA TOUR D'EAU CR–3 LES TRAVAUX ET L'INSTALLATION DE LA TOUR D'EAU CR–2 PEUVENT DÉBUTER.

GENÉRAL NOTES :

1– THE DISMANTLING AND INSTALLATION OF THE COOLING TOWER MUST BE DONE IN SEQUENCE I.E. ONE COOLING TOWER MUST BE FULLY FUNCTIONAL BEFORE BEGINNING WORK ON THE OTHER COOLING TOWER.

2– FIRST THE COOLING TOWER CR–3 MUST BE DEMOLISHED AND INSTALLED. ONCE, AFTER THE START UP OF THE COOLING TOWER CR–3, THE WORK TO DISMANTLE AND INSTALL THE COOLING TOWER CR–2 CAN BEGIN.

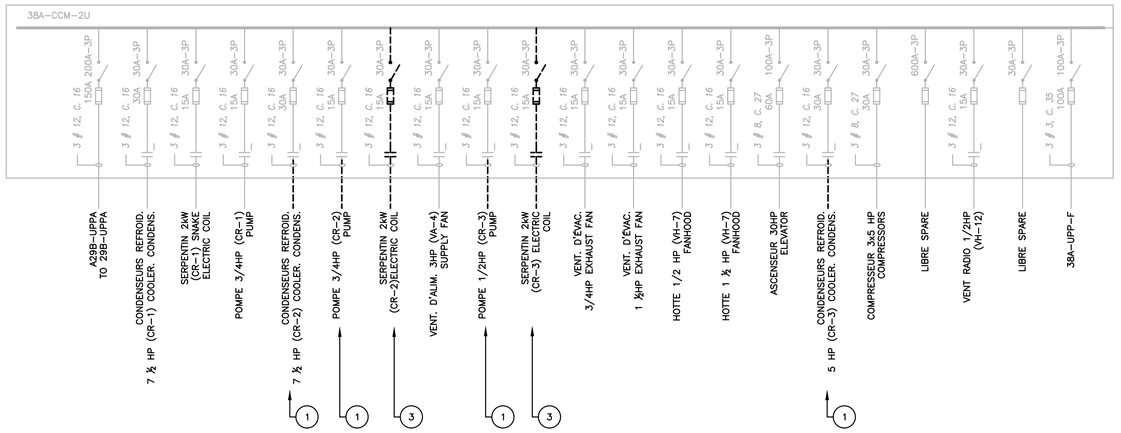
CES DOCUMENTS NE DOIVENT PAS ÊTRE UTILISÉS À DES FINS DE CONSTRUCTION (OU DE FABRICATION).

THESE DOCUMENTS MUST NOT USED FOR CONSTRUCTION (OR FABRICATION).

1 / E04 PANNEAU/PANEL PAN–38A–PEN

ÉCHELLE/SCALE: AUCUNE

EXISTANT



DÉMOLITION / DEMOLITION

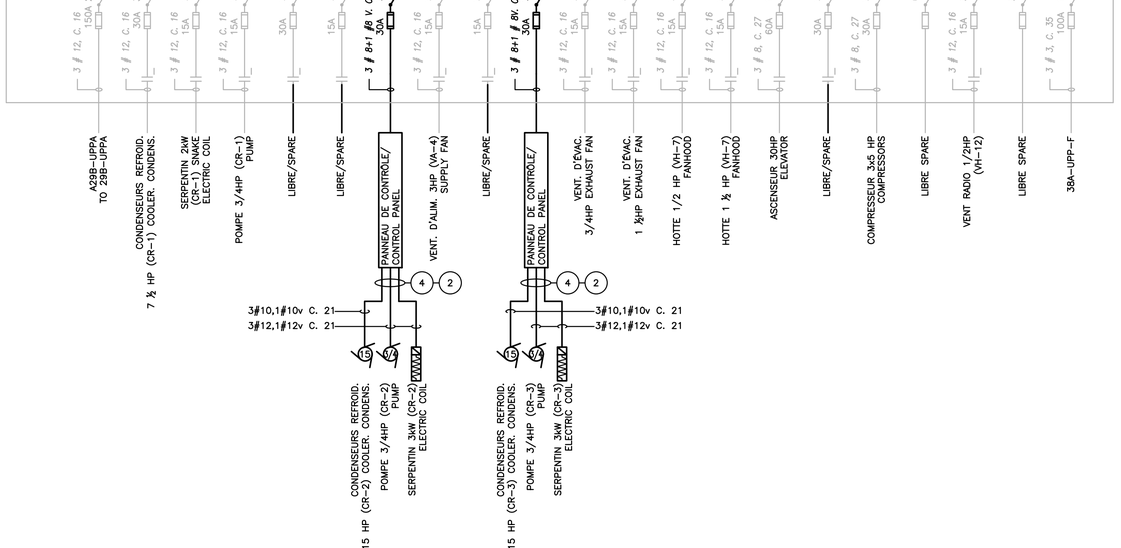
G.E.

CR 2000 TYPE B CLASS 1 600V 120
CONTROL 3 PH H BUS 600 V 300 60 H2
4002B4020

EXISTANT

ENTRÉE 5W	① COND. REFR 7 ½ HP CR2	ASCENSEUR 30 HP	ESPACE
	① POMPE 3/4 HP CR2	VENT. ALIM. 3 HP VH–1	ESPACE
① COND. REFR 5 HP CR3	③ 2kW CR2 SERPENTIN	HOTTE 1/2 HP VH–1	UNITÉ COND. 2HP
③ 2kW CR3 SERPENTIN	VENT ÉVAC. 1 ½ HP CR1	HOTTE 1/2 HP VH–1	VENT RUN AND STOP 1/2 HP VH12
① POMPE 1/2 HP CR3	VENT ÉVAC. 3/4 HP VE3		UNITÉ COND. 2HP
POMPE 3/4 HP CR1	2kW CR1 SERPENTIN	COND. REFR 7 ½ HP CR	VERS 38A–UPP–F

EXISTANT



NOUVEAU / NEW

2 / E04 CENTRE DE CONTRÔLES DES MOTEURS / MOTOR CONTROL CENTER 38A – CCM –2U

ÉCHELLE/SCALE: AUCUNE

3 / E04 DIAGRAMME UNIFILAIRES / SINGLE LINE DIAGRAM

ÉCHELLE/SCALE: AUCUNE

NOTES :

1 ENLEVER LES CONDUITS, LA FILERIE, LES SECTIONNEURS, LES BOÎTES DE JONCTION ET LES ACCESSOIRES JUSQU'AU POINT D'ALIMENTATION DANS LE CCM. MARQUER LE DÉMARREUR COMME LIBRE./
REMOVE THE CONDUITS WIRING, DISCONNECT SWITCHE, JUNCTION BOXES AND ACCESSORIES BACK TO THE SOURCE IN THE MCC. INDICATE THE STARTER AS SPARE.

2 FOURNIR ET INSTALLER LES NOUVEAUX CONDUITS, LA FILERIE, LES BOÎTES DE JONCTION, ET LES ACCESSOIRES POUR LA NOUVELLE TOUR D'EAU. FOURNIR ET INSTALLER UN NOUVEL INTERRUPTEUR À FUSIBLE 30 A, AVEC DES FUSIBLES 30 A DANS LE CCM./
PROVIDE AND INSTALL NEW CONDUITS, WIRING, JUNCTION BOXES, AND ACCESSORIES FOR THE CONNECTION OF THE NEW COOLING TOWER. PROVIDE AND INSTALL A NEW FUSIBLE DISCONNECT 30 A, WITH 30 A FUSES IN THE MCC.

3 ENLEVER LES CONDUITS, LA FILERIE, LES SECTIONNEURS LES BOÎTES DE JONCTION ET LES ACCESSOIRES JUSQU'AU POINT D'ALIMENTATION. ENLEVER LES CONTACTEURS, L'INTERRUPTEUR, ET LE FUSIBLE EXISTANTS DANS LE CCM./
REMOVE THE CONDUITS, WIRING DISCONNECT SWITCHES, JUNCTION BOXES AND ACCESSORIES BACK TO THE SOURCE. REMOVE THE EXISTING FUSIBLE SWITCH IN THE MCC.

4 LE CÂBLAGE POUR LE CONTRÔLE ENTRE LA TOUR ET LE PANNEAU EST EFFECTUÉ PAR DIVISION 25. LE RACCORDEMENT ET L'INSTALLATION DU PANNEAU DE CONTRÔLE EST PAR L'ENTREPRENEUR ÉLECTRICIEN. PRÉVOIR LES SUPPORTS CANTRUS POUR MONTAGE DU PANNEAU. /
THE CONTROL WIRING BETWEEN THE TOWER AND THE PANEL IS CARRIED OUT BY DIVISION 25. THE CONNECTION AND INSTALLATION OF THE CONTROL PANEL IS BY THE ELECTRICAL. FORESEE CANTRUS SUPPORTS TO SUPPORT THE CONTROL PANEL.

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BROSSARD (QUÉBEC) CANADA J4Y 0E3
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CONSULTANT - SOUS-CONSULTANT / CONSULTANT - SUB-CONSULTANT:

SCEAU / SEAL:

INGÉNIEUR Réal Ouimet 38333 QUÉBEC

2019-08-21

CLIENT / CLIENT:

Agriculture et Agroalimentaire Canada (AAC)

RÉF. CLIENT / CLIENT REF.: 532971

PROJET / PROJECT:

Remplacement de tours d'eau
Centre de recherche et de développement de St-Jean-sur-Richelieu/
Replacement of cooling tower for Research and Development Center
St-Jean -sur-Richelieu

PLAN CLÉ / KEY PLAN:

N

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NO PROJET / PROJECT NO: 191–08126–00
DATE / DATE: 2019–06–26
ÉCHELLE ORIGINALE / ORIGINAL SCALE: INDIQUÉE
PRÉPARÉ PAR / PREPARE BY: RÉAL OUIMET, ing.
MODIFIÉ PAR / MODIFIED BY: RÉAL OUIMET, ing.
ASSISTÉ DE / ASSISTED BY: T. BULMER
DESSINÉ PAR / DRAWN BY: J.–C. MOLINA

SI CETTE BARRE NE MESURE PAS 25 mm, AJUSTER VOTRE ÉCHELLE DE TRAÇAGE.
IF THIS BAR IS NOT 25 mm LONG, ADJUST YOUR PLOTTING SCALE.
25 mm

DISCIPLINE / DISCIPLINE: BÂTIMENT : ÉLECTRICITÉ / ELECTRICAL : BUILDING

TITRE / TITLE:

PANNEAU, CENTRES DE CONTRÔLE DES MOTEURS ET DIAGRAMME UNIFILAIRES / PANEL, MOTOR CONTROL CENTER AND SINGLE LINE DIAGRAM

NUMÉRO DU FEUILLET / SHEET NUMBER: **E04**
FEUILLET # / SHEET #: 4 DE / OF 4

ÉMISSION / ISSUE: ÉMIS POUR SOUMISSIONS / ISSUED FOR TENDER
EN DATE DU / DATE OF: 19-08-20
RV./RV. #: 0

Appendix "F"

INSURANCE TERMS

INSURANCE TERMS

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 Contactor shall deposit with Canada a CERTIFICATE OF INSURANCE (form AAFC / AAC5314) available upon request.

2) In the event that the Contractor already possesses an insurance certificate clearly demonstrating that their insurance coverage meets IN2.1 Scope of Policy provisions, then the Contractor may deposit an original copy of this insurance certificate.

3) 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 $5,000,000.00 ;

   (b) a Products/Completed Operations Aggregate Limit of not less than $5,000,000.00 ; and

   (c) a General Aggregate Limit of not less than $10,000,000.00 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-owed 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 SUBSTANTIAL PERFORMANCE.

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.

Appendix "G"

CONTRACT DOCUMENTS

MAJOR WORKS - CONTRACT DOCUMENTS

SC01 CONTRACT DOCUMENTS

1) The following are the contract documents:

   (a) Contract page when signed by Canada;

   (b) Duly completed Bid and Acceptance Form and any Appendices attached thereto;

   (c) Drawings and Specifications;

   (d) AAFC General Conditions form AAFC / AAC5321-E:

(i)	GC1	General Provisions
(ii)	GC2	Administration of the Contract
(iii)	GC3	Execution and Control of the Work
(iv)	GC4	Protective Measures
(v)	GC5	Terms of Payment
(vi)	GC6	Delays and Changes in the Work
(vii)	GC7	Default, Suspension or Termination of Contract
(viii)	GC8	Dispute Resolution
(ix)	GC9	Contract Security
(x)	GC10	Insurance

   (e) Supplementary Conditions, if any;

   (f) Insurance Terms form AAFC / AAC5315-E;

   (g) Any amendment issued or any allowable bid revision received before the date and time set for solicitation closing;

   (h) Any amendment incorporated by mutual agreement between Canada and the Contractor before acceptance of the bid; and

   (i) Any amendment or variation of the contract documents that is made in accordance with the General Conditions.

2) The language of the contract documents shall be the language of the Bid and Acceptance Form submitted.

SC02 ACCEPTANCE AND CONTRACT

1) 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 referred to in SC01 CONTRACT DOCUMENTS.

Appendix "H"

CONTRACT

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CONTRACT

PURCHASING OFFICE

Agriculture and Agri-Food Canada
Eastern Service Centre
Tender Receiving Unit
2001 Robert-Bourassa Boulevard, Suite 671-TEN
Montréal, Quebec
H3A 3N2

Your tender is accepted to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the construction listed herein and on any attached sheets at the price or prices set out therefor.

Comments

Vendor / Firm Name and Address

Title

Solicitation / Contract No. | Date

Client Reference No.

File No.

Financial Code(s)

GST HST
QST

F.O.B
Destination

Applicable Taxes
Included

Destination

Invoices - Original and two copies to be sent to :

Address Enquiries to:

Telephone No. Ext. | Fax No.

Total Estimated Cost | Currency Type
CAD

For the Minister

Signature | Date

Canada

FORMS

- Bid Bond
- Certificate of Insurance
- Labour and Material Payment Bond
- Performance Bond
- T4-A Certification

Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

BID BOND

BOND NUMBER: _____ **AMOUNT:** _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ as Principal,

hereinafter called the Principal, and _____ as Surety,

hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food, as Obligee, hereinafter called the Crown, in the amount of

_____

dollars ($ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, 20__.

WHEREAS, the Principal has submitted a written tender to the Crown, dated the _____ day of _____, 20__,

for _____

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that if:

(a) the Principal, should his tender be accepted within the period specified by the Crown, or, if no period be specified, within sixty (60) days after closing date of the tender, does execute within a period specified by the Crown, or, if no period be specified therein, within fourteen (14) days after the prescribed forms are presented to him for signature, execute such further contractual documents, if any, as may be required by the terms of the tender as accepted, and does furnish a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the Contract price and satisfactory to the Crown, or other security acceptable to the Crown, or

(b) the Principal does pay to the Crown the difference between the amount of the Principal's tender and the amount of the Contract entered into by the Crown for the work, supplies and services which were specified in the said tender, if the latter amount be in excess of the former,

then this obligation shall be void; otherwise it shall remain in full force and effect.

PROVIDED, HOWEVER, that the Surety and the Principal shall not be liable to the Crown for an amount greater than the amount specified in this bond.

PROVIDED FURTHER that the Surety shall not be subject to any suit or action unless such suit or action is instituted and process therefore served upon the Surety at its Head Office in Canada, within twelve (12) months from the date of this bond.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

_____
Principal

_____
Witness

_____
Surety

Note: Affix Corporate seal if applicable.

Canada

Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

CERTIFICATE OF INSURANCE

To be completed by the Insurer

CONTRACT

Description and location of work	Contract No.
	Project No.

INSURER			BROKER		
Company name			Company name		
Unit/Suite/Apt.	Street number	Number suffix	Unit/Suite/Apt.	Street number	Number suffix
Street name			Street name		
Street type	Street direction	PO Box or Route Number	Street type	Street direction	PO Box or Route Number
Municipality (City, Town, etc.)			Municipality (City, Town, etc.)		
Province/State	Postal/ZIP code		Province/State	Postal/ZIP code	

INSURED			ADDITIONAL INSURED
Contractor name			
Unit/Suite/Apt.	Street number	Number suffix	
Street name			
Street type	Street direction	PO Box or Route Number	Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food Canada.
Municipality (City, Town, etc.)			
Province/State	Postal/ZIP code		

This insurer certifies that the following policies of insurance are at present in force covering all operations of the Insured, in connection with the contract made between the named insured and Her Majesty the Queen in right of Canada, represented by the Minister of Agriculture and Agri-Food Canada.

POLICY

Scope of Policy	Number	Inception Date	Expiry Date	Limit of Liability		
				Per Occurance	General Aggregate Limit	Products / Completed Operations Aggregate Limit
Commercial General Liability						
Builder's Risk "All Risks"/ Installation Floater "All Risks"						
Automobile Insurance				(not less than $1,000,000.00 inclusive per occurrence)		
Other (list)						

Each of these policies includes the coverages and provisions as specified in Insurance Terms and each policy has been endorsed to cover Her Majesty as an Additional Insured. The Insurer agrees to notify Her Majesty and the Named insured in writing thirty (30) days prior to any material change in, or cancellation of any policy or coverage.

Name of Insurer's Officer or Authorized Employee | Telephone number | Ext.

Signature | Date

Canada

LABOUR AND MATERIAL PAYMENT BOND

BOND NUMBER: _____ **AMOUNT:** _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ as Principal,

hereinafter called the Principal, and _____ as Surety,

hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food, as Obligee, hereinafter called the Crown, in the amount of

_____

dollars ($ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, 20__

WHEREAS, the Principal has entered into a Contract with the Crown dated the _____ day of _____ , 20__,

for _____

which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that, if payment is promptly made to all Claimants who have performed labour or services or supplied material in connection with the Contract and any and all duly authorized modifications and extensions of the Contract that may hereafter be made, notice of which modifications and extensions to the Surety being hereby waived, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. For the purpose of this bond, a Claimant is defined as one having a direct contract with the Principal or any Sub-Contractor of the Principal for labour, material or both, used or reasonably required for use in the performance of the Contract, labour and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone services or rental of equipment (but excluding rental of equipment where the rent pursuant to an agreement is to be applied towards the purchase price thereof) directly applicable to the Contract.

2. For the purpose of this Bond, no payment is required to be made in respect of a claim for payment for labour or services performed or material supplied in connection with the Contract that represents a capital expenditure, overhead or general administration costs incurred by the Principal during the currency or in respect of the Contract.

3. The Principal and the Surety hereby jointly and severally agree with the Crown that if any Claimant has not been paid as provided for under the terms of his contract with the Principal or a Sub-Contractor of the Principal before the expiration of a period of ninety (90) days after the date on which the last of such Claimant's labour or service was done or performed or materials were supplied by such Claimant, the Crown may sue on this bond, have the right to prosecute the suit to final judgment for such sum or sums as may be due and have execution thereon; and such right of the Crown is assigned by virtue of Part VIII of the *Financial Administration A*ct to such Claimant.

4. For the purpose of this bond the liability of the Surety and the Principal to make payment to any claimant not having a contract directly with the Principal shall be limited to that amount which the Principal would have been obliged to pay to such claimant had the provisions of the applicable provincial or territorial legislation on lien or privileges been applicable to the work. A claimant need not comply with provisions of such legislation setting out steps by way of notice, registration or otherwise as might have been necessary to preserve or perfect any claim for lien or privilege which the claimant might have had. Any such claimant shall be entitled to pursue a claim and to recover judgment hereunder subject to the terms and notification provisions of the Bond.

5. Any material change in the Contract between the Principal and the Crown shall not prejudice the rights or interest of any Claimant under this Bond who is not instrumental in bringing about or has not caused such change.

6. No suit or action shall be commenced hereunder by any Claimant:

   (a) Unless such Claimant shall have given written notice within the time limits hereinafter set forth to the Principal and the Surety above named, stating with substantial accuracy the amount claimed. Such notice shall be served by mailing the same by registered mail to the Principal and the Surety at any place where an office is regularly maintained for the transaction of business by such persons or served in any manner in which legal process may be served in the Province or other part of Canada in which the subject matter of the Contract is located. Such notice shall be given

      (i) in respect of any claim for the amount or any portion thereof required to be held back from the Claimant by the Principal or by the Sub-Contractor of the Principal under either the terms of the Claimant's Contract with the Principal or the Claimant's Contract with the Sub-Contractor of the Principal within one hundred and twenty (120) days after such Claimant should have been paid in full under this Contract;

      (ii) in respect of any claim other than for the holdback or portion thereof referred to above within one hundred and twenty (120) days after the date upon which such Claimant did or performed the last of the service, work or labour or furnished the last of the materials for which such claim is made under the Claimant's Contract with the Principal or a Sub-Contractor of the Principal;

   (b) After the expiration of one (1) year following the date on which the Principal ceased work on the said Contract, including work performed under the guarantees provided in the Contract;

   (c) Other than in a court of competent jurisdiction in the province or district of Canada in which the subject matter of the Contract or any part thereof is situated and not elsewhere, and the parties hereto hereby agree to submit to the jurisdiction of such court.

7. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

8. The Surety shall not be entitled to claim any moneys relating to the Contract and the liability of the Surety under this Bond shall remain unchanged and, without restricting the generality of the foregoing, the Surety shall pay all valid claims of Claimants under this Bond before any moneys relating to the Contract held by the Crown are paid to the Surety by the Crown.

9. The Surety shall not be liable for a greater sum that the amount specified in this bond.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

_____
Principal

_____
Witness

_____
Surety

Note: Affix Corporate seal if applicable.

Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

PERFORMANCE BOND

BOND NUMBER: _____ **AMOUNT:** _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ as Principal,

hereinafter called the Principal, and _____ as Surety,

hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto Her Majesty the Queen in right of Canada as represented by the Minister of Agriculture and Agri-Food, as Obligee, hereinafter called the Crown, in the amount of

_____

dollars ($ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, 20__.

WHEREAS, the Principal entered into a Contract with the Crown dated the _____ day of _____, 20__,

for _____

which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that, if the Principal shall well and faithfully observe and perform all the obligations on the part of the Principal to be observed and performed in connection with the Contract, then this obligation shall be void, otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. Whenever the Principal shall be, and declared by the Crown to be, in default under the Contract, the Surety shall:
   (a) if the work is not taken out of the Principal's hands, remedy the default of the Principal,
   (b) if the work is taken out of the Principal's hands and the Crown directs the Surety to undertake the completion of the work, complete the work in accordance with the Contract provided that if a contract is entered into for the completion of the work,
      (i) it shall be between the Surety and the completing contractor, and
      (ii) the selection of such completing contractor shall be subject to the approval of the Crown,
   (c) if the work is taken out of the Principal's hands and the Crown, after reasonable notice to the Surety, does not direct the Surety to undertake the completion of the work, assume the financial responsibility for the cost of completion in excess of the moneys available to the Crown under the Contract,
   (d) be liable for and pay all the excess costs of completion of the Contract, and
   (e) not be entitled to any Contract moneys earned by the Principal, up to the date of his default on the Contract and any holdbacks relating to such earned Contract moneys held by the Crown, and the liability of the Surety under this Bond shall remain unchanged provided, however, and without restricting the generality of the foregoing, upon the completion of the Contract to the satisfaction of the Crown, any Contract moneys earned by the Principal or holdbacks related thereto held by the Crown may be paid to the Surety by the Crown.
2. The Surety shall not be liable for a greater sum than the amount specified in this Bond.
3. No suit or action shall be instituted by the Crown herein against the Surety pursuant to these presents after the expiration of two (2) years from the date on which final payment under the Contract is payable.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

_____
Principal

_____
Witness

_____
Surety

Note: Affix Corporate seal if applicable.

Canada

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T4-A CERTIFICATION

The Contractor shall complete and submit this T4-A Certification within fourteen (14) calendar days of Notification of Contract award and within fourteen (14) calendar days immediately following any change to the information already provided under the Contract. Failure to provide this information or failure to provide the correct information shall result in a fundamental breach of the Contract.

1. **The Contractor shall enter a [x] in one of the boxes below opposite the description that best describes its status.**

[ ] A business incorporated either federally or provincially;
[ ] An unincorporated business, either as a sole proprietor or a partnership; or
[ ] An individual.

Note: The information provided in Section 2 must correspond with that provided in Section 1.

Corporate or unincorporated business or individual's name: _____

Street Name or Box #: _____

City, Town or Village: _____

Province: _____

Postal Code: _____

2. Contractor shall complete Section 2(a) or 2(b) or 2(c), whichever is applicable to its situation.

(a) If incorporated:

Business Number (BN): _____, or
GST / HST Number: _____, or
T2 Corporation Tax Number (T2N): _____, whichever is applicable

(b) If unincorporated:

Social Insurance Number (SIN): _____, and
Business Number (BN): _____, or
GST / HST Number: _____, whichever is applicable

Note: The Unincorporated Business Name must be the same as the name associated with the Revenue Canada Business Number or the GST Number.

(c) If individual:

Social Insurance Number (SIN): _____, and
Business Number (BN): _____, or
GST / HST Number: _____, whichever is applicable

Note: The Individual's Name must be the same as the name associated with the Social Insurance Number.

3. WE HEREBY CERTIFY that I/We have examined the information provided above, including the legal name, address and Revenue Canada identifier (SIN, BN, GST / HST No., T2N), as applicable, and that it is correct and complete, and fully discloses my/our identification.

_____	_____	_____
Contractor's signature	Title of Signatory	Date