Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

INVITATION TO TENDER

FOR

EAST RAMP REHABILITATION
Building 88
Project: MCE13 A532

CENTRAL EXPERIMENTAL FARM (CEF)
Agriculture and Agri-Food Canada (AAFC)
K.W. Neatby Building
960 Carling Avenue
Ottawa, Ontario K1A 0C6

SOLICITATION #13-1308

Jean-Pierre Simard
Senior Contracts Officer
613 759-6157
jean-pierre.simard@agr.gc.ca

CLOSING: Monday November 25, 2012 at 02:00 p.m. Eastern Standard Time (EST)

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SPECIAL INSTRUCTIONS TO BIDDERS (SI)

SI01 BID DOCUMENTS

1) The following are the bid documents:

   a) Invitation to Tender - Page 1;
   b) Special Instructions to Bidders;
   c) General Instructions to Bidders;
   d) Clauses & Conditions identified in “Contract Documents”;
   e) Drawings and Specifications;
   f) Bid and Acceptance Form and related Appendice(s); 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 as early as possible within the solicitation period to:

   Jean-Pierre Simard
   Senior Contracts Officer
   Agriculture and Agri-Food Canada
   960 Carling Ave. (K.W. Neatby building)
   Ottawa, Ontario K1A 0C6
   Telephone: 613 759-6157
   Facsimile: 613 759-7005
   Jean-pierre.simard@agr.gc.ca

   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 herein. Failure to comply with this requirement may result in the bid being declared non-responsive.

SI03 OPTIONAL SITE VISIT

It is recommended that the Bidder or a representative of the Bidder visit the work site. Arrangements have been made for a tour of the work site. The site visit will be held on **Monday November 18, 2013 at 10:00** am at the CEF Ottawa, **K.W. Neatby building, 960 Carling Avenue**, Ottawa. Bidders who do not attend or send a representative will not be given an alternative appointment but they will not be precluded from submitting a bid. Any clarifications or changes to the bid solicitation resulting from the site visit will be included as an amendment to the bid solicitation.

SI04 REVISION OF BID

A bid may be revised by letter in accordance with GI08 of the “General Instructions to Bidders“.

SI05 BID RESULTS

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

SI06 INSUFFICIENT FUNDING
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 BA04 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 tender.

4) The provisions expressed herein do not in any manner limit Canada's rights in law or under GI09 of the "General Instructions to Bidders ".

SI08 CONSTRUCTION DOCUMENTS
The successful contractor will be provided with one paper copy of the sealed and signed drawings, the specifications and the amendments upon acceptance of the offer. Obtaining more copies shall be the responsibility of the contractor including costs.

SI09 SECURITY CLEARANCE
This document contains no mandatory security requirements.

SI10 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
Contracts Canada (Buy and Sell):
https://www.achatsetventes-buyandsell.gc.ca/eng/welcome
Canadian economic sanctions:
http://www.international.gc.ca/sanctions/index.aspx?lang=eng
Contractor Performance Evaluation Report (Form PWGSC-TPSGC 2913):
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/2913.pdf
Certificate of Insurance (form PWGSC-TPSGC 357):
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/357.pdf
SACC Manual:
http://ccua-sacc.tpsgc-pwgsc.gc.ca/pub/acho-eng.jsp
Schedules of Wage Rates for Federal Construction Contracts:
http://www.rhdcc-hrsdc.gc.ca/eng/labour/employment_standards/contracts/schedule/index.shtml

GENERAL INSTRUCTIONS TO BIDDERS (GI)

GI01 Code of Conduct and Certifications – Bid

1. Bidders must comply with the *Code of Conduct for Procurement*. In addition to the *Code of Conduct for Procurement*, bidders must:

   a. respond to bid solicitations in an honest, fair and comprehensive manner,

   b. accurately reflect their capacity to satisfy the requirements stipulated in the bid solicitations and resulting contracts,

   c. submit bids and enter into contracts only if they will fulfill all obligations of the Contract.

2. Bidders further understand that, to ensure fairness, openness and transparency in the procurement process, the commission of certain acts or offences will render them ineligible to be awarded a contract. Canada will declare non-responsive any bid in respect of which the information herein requested is missing or inaccurate, or in respect of which the information contained in the certifications specified hereinafter is found to be untrue, in any respect, by Canada. If it is determined, after contract award, that the Bidder made a false declaration, Canada will have the right to terminate the Contract for default. The Bidder will be required to diligently maintain up-to-date the information herein requested. The Bidder and any of the Bidder's affiliates, will also be required to remain free and clear of any acts or convictions specified herein during the period of any contract arising from this bid solicitation.

3. For the purpose of this section, everyone, including but not limited to organizations, bodies corporate, societies, companies, firms, partnerships, associations of persons, parent companies, and subsidiaries, whether partly or wholly-owned, as well as individuals, and directors, are Bidder's affiliates if:

   a. directly or indirectly either one controls or has the power to control the other, or
   b. a third party has the power to control both.

   Indicia of control, include, but are not limited to, interlocking management or ownership, identity of interests among family members, shared facilities and equipment, common use of employees, or a business entity created following the acts or convictions specified in this section which has the same or similar management, ownership, or principal employees, as the case may be.

4. Bidders who are incorporated, including those bidding as a joint venture, must provide with their bid or promptly thereafter a complete list of names of all individuals who are currently directors of the Bidder. Bidders bidding as sole proprietorship, including those bidding as a joint venture, must provide with their bid or promptly thereafter the name of the owner. Bidders bidding as societies, firms, or partnerships do not need to provide lists of names. If the required names have 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 comply will render the bid non-responsive. Providing the required names is a mandatory requirement for contract award.

   Canada may, at any time, request that a Bidder provide properly completed and Signed Consent Forms (Consent to a Criminal Record Verification form - PWGSC-TPSGC 229) for any or all

individuals aforementioned within the time specified. Failure to provide such Consent Forms within the time period provided will result in the bid being declared non-responsive.

5. The Bidder must diligently maintain an up-to-date list of names by informing Canada in writing of any change occurring during the validity period of the bid as well as during the period of any contract arising from this bid solicitation. The Bidder must also, when so requested, provide Canada with the corresponding Consent Forms.
6. By submitting a bid, the Bidder certifies that it is aware, and that its affiliates are aware, that Canada may request additional information, certifications, consent forms and other evidentiary elements proving identity or eligibility. Canada may also verify the information provided by the Bidder, including the information relating to the acts or convictions specified herein, through independent research, use of any government resources or by contacting third parties.

7. By submitting a bid, the Bidder certifies that neither the Bidder nor any of the Bidder's affiliates have directly or indirectly, paid or agreed to pay, and will not, directly or indirectly, pay a contingency fee to any individual for the solicitation, negotiation or obtaining of the Contract if the payment of the fee would require the individual to file a return under section 5 of the *Lobbying Act*.

8. By submitting a bid, the Bidder certifies that no one convicted under any of the provisions under a) or b) are to receive any benefit under a contract arising from this bid solicitation. In addition, the Bidder certifies that except for those offences where a criminal pardon or a record suspension has been obtained or capacities restored by the Governor in Council, neither the Bidder nor any of the Bidder's affiliates has ever been convicted of an offence under any of the following provisions:

    a. 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*, or

    b. section 121 (*Frauds on the government and Contractor subscribing to election fund*), section 124 (*Selling or Purchasing Office*), section 380 (*Fraud*) for fraud committed against Her Majesty or section 418 (*Selling defective stores to Her Majesty*) of the *Criminal Code* of Canada, or

    c. section 462.31 (*Laundering proceeds of crime*) or sections 467.11 to 467.13 (*Participation in activities of criminal organization*) of the *Criminal Code* of Canada, or

    d. section 45 (*Conspiracies, agreements or arrangements between competitors*), 46 (*Foreign directives*) 47 (*Bid rigging*), 49 (*Agreements or arrangements of federal financial institutions*), 52 (*False or misleading representation*), 53 (*Deceptive notice of winning a prize*) under the *Competition Act*, or

    e. section 239 (*False or deceptive statements*) of the *Income Tax Act*, or

    f. section 327 (*False or deceptive statements*) of the *Excise Tax Act*, or

    g. section 3 (*Bribing a foreign public official*) of the *Corruption of Foreign Public Officials Act*, or

    h. section 5 (*Trafficking in substance*), section 6 (*Importing and exporting*), or section 7 (*Production of substance*) of the *Controlled Drugs and Substance Act*.

9. In circumstances where a criminal pardon or a record suspension has been obtained, or capacities have been restored by the Governor in Council, the Bidder must provide with its bid or promptly thereafter a copy of confirming documentation from an official source. If such documentation 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 comply will render the bid non-responsive.

10. Bidders understand that Canada may contract outside of the present solicitation process with a supplier who has been convicted of an offense enumerated under c) to h) of the paragraph hereinabove, or who is affiliated with someone who has been convicted of an offense enumerated under c) to h) of the paragraph hereinabove, when required to do so by law or legal proceedings, or when Canada considers it necessary to the public interest for reasons which include, but are not limited to:

    - Only one person is capable of performing the contract;
    - Emergency;
    - National security;
    - Health and safety;
    - Economic harm;

    Canada reserves the right to impose additional conditions or measures to ensure the integrity of the procurement process.

GI02 Completion of Bid

1. The bid shall be:

    a. submitted on the Bid and Acceptance Form;
    b. based on the Bid Documents listed in the Special Instructions to Bidders;
    c. correctly completed in all respects;
    d. signed by a duly authorized representative of the Bidder; and
    e. accompanied by any other document or documents specified elsewhere in the solicitation where it is stipulated that said documents are to accompany the bid.

2. Subject to paragraph 6) of GI09, 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.

GI03 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.

GI04 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.

GI05 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.

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 forty-eight (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 Submission of Bid

1. The Bid and Acceptance Form, duly completed, shall be enclosed and sealed in an envelope provided by the Bidder, and shall be addressed and submitted to the office designated on the Front Page "Invitation to Tender" 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.

GI08 Revision of Bid

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

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

3. A letter 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).

GI09 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 GI09, Canada may reject a bid if any of the following circumstances is present:

    a. the Bidder's bidding privileges are suspended or are in the process of being suspended;
    b. 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;
    c. the Bidder is bankrupt, or where for whatever reason, its activities are rendered inoperable for an extended period;
    d. 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;
    e. 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;
    f. 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 he 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.f. i & ii of GI09, 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 GI09, 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, 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. When Canada intends to reject a bid pursuant to a provision of paragraphs 1), 2), 3) or 4) of GI09, other than subparagraph 2)(a) of GI09, 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.

GI10 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.

GI11 Procurement Business Number

1. Bidders are required to have a Procurement Business Number (PBN) before contract award. Bidders may register for a PBN in the Supplier Registration Information system on the Contracts Canada Web site. For non-Internet registration, Bidders may contact the nearest Supplier Registration Agent.

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 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 ten (10) calendar days prior to the solicitation closing date. If the alternative materials are approved for the purposes of the bid, an addendum to the bid documents shall be issued.]

GI14 Performance Evaluation

1. Bidders shall take note that the performance of the Contractor during and upon completion of the work shall be evaluated by Canada. The evaluation shall be based on the quality of workmanship; timeliness of completion of the work; project management, contract management and management of health and safety. Should the Contractor's performance be considered unsatisfactory, the Contractor's bidding privileges on future work may be suspended indefinitely.

2. The form PWGSC-TPSGC 2913, SELECT - Contractor Performance Evaluation Report Form, is used to record the performance.

GI15 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.

SUPPLEMENTARY CONDITIONS (SC)

SC01 LIMITATION OF LIABILITY

GC1.6 of R2810D is deleted and replaced with the following:

GC1.6 Indemnification by the Contractor

1. The Contractor shall indemnify and save Canada harmless from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings whether in respect to losses suffered by Canada or in respect of claims 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 in performing the Work, provided such claims are caused by the negligent or deliberate acts or omissions of the Contractor, or those for whom it is responsible at law.

2. The Contractor's obligation to indemnify Canada for losses related to first party liability shall be limited to:

   a. In respect to each loss for which insurance is to be provided pursuant to the insurance requirements of the Contract, the Commercial General Liability insurance limit for one occurrence, as referred to in the in the insurance requirements of the Contract.

   b. In respect to losses for which insurance is not required to be provided in accordance with the insurance requirements of the Contract, the greater of the Contract Amount or $5,000,000, but in no event shall the sum be greater than $20,000,000.

   The limitation of this obligation shall be exclusive of interest and all legal costs and shall not apply to any infringement of intellectual property rights or any breach of warranty obligations.

3. The Contractor's obligation to indemnify Canada for losses related to third party liability shall have no limitation and shall include the complete costs of defending any legal action by a third party. If requested by Canada, the Contractor shall defend Canada against any third party claims.

4. 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.

5. Notice in writing of a claim shall be given within a reasonable time after the facts, upon which such claim is based, became known.

SC02 INSURANCE TERMS

GC9.3.3 of R2590D is deleted and replaced with the following:

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

CONTRACT DOCUMENTS (CD)

1. The following are the contract documents:

   a) Contract Page(s) when signed by Canada;
   b) Duly completed Bid and Acceptance Form and any Appendices attached thereto;
   c) Drawings and Specifications;
   d) General Conditions and clauses
      GC1 General Provisions R2810D (2013-04-25);
      GC2 Administration of the Contract R2820D (2012-07-16);
      GC3 Execution and Control of the Work R2830D (2010-01-11);
      GC4 Protective Measures R2840D (2008-05-12);
      GC5 Terms of Payment R2550D (2010-01-11);
      GC6 Delays and Changes in the Work R2865D (2008-05-12);
      GC7 Default, Suspension or Termination of Contract R2870D (2008-05-12);
      GC8 Dispute Resolution R2884D (2008-05-12);
      GC9 Insurance R2590D (2011-05-16);
      Supplementary Conditions
      Fair Wages and Hours of Labour - Labour Conditions R2940D (2012-07-16);
      Allowable Costs for Contract Changes under GC6.4.1 R2950D (2007-05-25);
      Schedules of Wage Rates for Federal Construction Contracts;
   e) Any amendment issued or any allowable bid revision received before the date and time set or solicitation closing;
   f) Any amendment incorporated by mutual agreement between Canada and the Contractor before acceptance of the bid; and
   g) Any amendment or variation of the contract documents that is made in accordance with the General Conditions.

2. The documents identified by title, number and date above are incorporated by reference and are set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is available on the PWGSC Web site: https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual

3. Schedules of Wage Rates for Federal Construction Contracts are included by reference and may be accessed from the Web site: http://www.rhdcc-hrsdc.gc.ca/eng/labour/employment_standards/contracts/schedule/index.shtml

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

BID AND ACCEPTANCE FORM (BA)

BA01 IDENTIFICATION

EAST RAMP REHABILITATION
Building 88
Project: MCE13 A532
Solicitation # 13-1308

BA02 BUSINESS NAME AND ADDRESS OF BIDDER

Name: _____

Address: _____
_____

Telephone: _____
Fax: _____
Email: _____
PBN: _____

BA03 THE OFFER
The Bidder offers to Canada to perform and complete the Work for the above named project in accordance with the Bid Documents for the **TOTAL BID AMOUNT INDICATED IN APPENDIX 1**.

BA04 BID VALIDITY PERIOD
The bid shall not be withdrawn for a period of 30 days following the date of solicitation closing.

BA05 ACCEPTANCE AND CONTRACT
Upon acceptance of the Contractor's offer by Canada, a binding Contract shall be formed between Canada and the Contractor. The documents forming the Contract shall be the contract documents identified in Contract Documents (CD).

BA06 CONSTRUCTION TIME
The Contractor shall perform and complete the Work within **eight (8) weeks** from the date of notification of acceptance of the offer.

BA07 SIGNATURE

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

_____ _____
Signature Date

APPENDIX 1 - COMBINED PRICE FORM

1) The prices per unit shall govern in establishing the Total Extended Amount. Any arithmetical errors in this Appendix will be corrected by Canada.

2) Canada may reject the bid if any of the prices submitted do not reasonably reflect the cost of performing the part of the work to which that price applies.

LUMP SUM

The Lump Sum Amount designates Work to which a Lump Sum Arrangement applies.

(a) Work included in the Lump Sum Amount represents all work not included in the unit price table.

LUMP SUM AMOUNT (LSA) Excluding Applicable Taxes	

UNIT PRICE TABLE

The Unit Price Table designates Work to which a Unit Price Arrangement applies.

(a) Work included in each item is as described in the referenced specification section.
(b) The Price per Unit shall not include any amounts for Work that is not included in that unit price Item.

Item	Specification Reference	Class of Labour, Plant or Material	Unit of Measurement	Estimated Quantity (EQ)	**Price per Unit** Applicable Taxes extra (PU)	**Extended amount** Applicable Taxes extra (EQ x PU)
1	04 03 42	Remove and replace with new Rubble finish stone units. Including all required anchors, collar joints, bedding mortar, and pointing. Average size of stone unit is 300x200x225mm thick.	m^2	0.5 m^2		
2	04 03 42	Remove and replace with new Ashlar finish cap stone units as specified. Including all required anchors, collar joints, bedding mortar, and pointing.	Each	6		
3	04 03 42	Remove and reset displaced stones including all required anchors, collar joints, bedding mortar, and pointing. Average stone size is 300x200x225mm thick.	m^2	2 m^2		
4	04 03 41	Perform in-site stone repair to fractured units. Including all required collar joints, bedding mortar, and pointing.	Each	2		
5	04 03 41	Remove, repair and re-anchor fractured units, including all required collar joints, bedding mortar, and pointing.	Each	2		
6	04 03 41	Perform minor crack repairs to fractured stone units that do not require in-site pinning.	Each	0		
					TOTAL EXTENDED AMOUNT (TEA) Excluding Applicable Taxes	
					TOTAL BID AMOUNT (LSA +TEA) Excluding Applicable Taxes	

Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

DRAWINGS AND SPECIFICATIONS

#13-1308

FOR

EAST RAMP REHABILITATION
Building 88
Project: MCE13 A532

CENTRAL EXPERIMENTAL FARM (CEF)
Agriculture and Agri-Food Canada (AAFC)
960 Carling Avenue
Ottawa, Ontario K1A 0C6

TABLE OF CONTENTS

Part 1 General

1.1 MINIMUM STANDARDS

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

1.2 SHOP DRAWINGS

.1 Submit for the Departmental Representative's review, five (5) copies of each shop drawing.

.2 The review is for the sole purpose of ascertaining conformance with the general design concept, and does not mean approval of the design details inherent in the shop drawings, responsibility for which shall remain with the Contractor. Such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents.

.3 Do not commence manufacture or order materials before shop drawings are reviewed.

1.3 SAMPLES

.1 Samples: examples of materials, equipment, quality, finishes, workmanship.

.2 Where colour, pattern or texture is criterion, submit full range of samples.

.3 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.

1.4 PRODUCT DATA

.1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.

.2 Submit five (5) copies of product data.

.3 Delete information not applicable to project.

.4 Cross-reference product data information to applicable portions of Contract Documents.

1.5 TAXES

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

1.6 FEES, PERMITS AND CERTIFICATES

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

1.7 FIRE SAFETY REQUIREMENTS

.1 Comply with the National Building Code of Canada 2010 (NBC) for fire safety in construction and the National Fire Code of Canada 2010 (NFC) for fire prevention, fire fighting and life safety in building in use.

.2 Comply with Human Resources Development Canada (HRDC), Fire Commissioner of Canada (FCC) standards:

.1 No. 301: Standard for Construction Operations.

.2 No. 302: Standard for Welding and Cutting.

.3 No. 374: Fire Protection Standard for General Storage (Indoor and Outdoor).

.4 Available from Fire Protection Engineering Services, Labour Program, HRDC or following internet site:
http://www.hrsdc.gc.ca/asp/gateway.asp?hr=en/lp/lo/fp/standards/commissioner.shtml&hs=fzp

.5 Retain all fire safety documents and standards on site.

.3 Welding and cutting:

.1 Before welding, soldering, grinding and/or cutting work, obtain a permit from the Fire Prevention Unit as directed by the Departmental Representative. Store flammable liquids in approved CSA containers inspected by the Fire Prevention Unit. No open flame shall be used unless authorized by the Fir Prevention Unit.

.2 At least 48 hours prior to commencing cutting, welding or soldering procedure, provide to Departmental Representative:

.1 Notice of intent, indicating devices affected, time and duration of isolation or bypass.

.2 Completed welding permit as defined in FC 302.

.3 Return welding permit to Departmental Representative immediately upon completion of procedures for which permit was issued.

.3 A fire watcher as described in FC 302 shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 10m may be ignited by conduction or radiation.

.4 Where work requires interruption of fire alarms or fire suppression, extinguishing or protection systems:

.1 Provide watchman service as described in FC 301; In general, watchman service is defined as an individual conversant with Fire Emergency Procedures, performing fire picket duty within an unprotected and unoccupied (no workers) area once per hour.

.2 Retain services of manufacturer for fire protection systems on daily basis or as approved by FCC, to isolate and protect all devices relating to:

.1 modification of fire alarms, fire suppression, extinguishing or protection systems; and/or

.2 cutting, welding, soldering or other construction activities which might activate fire protection systems.

.5 Immediately upon completion of work, restore fire protection systems to normal operation and verify that all devices are fully operational.

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

1.8 FIELD QUALITY CONTROL

.1 Carry out Work using qualified licensed workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.

.2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licensed workers.

.3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.

1.9 HAZARDOUS MATERIALS

.1 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of Material Safety Data Sheets (MSDS) acceptable to Human Resources Development Canada, Labour Program.

.2 For work in occupied buildings give the Departmental Representative 48 hours notice for work involving designated substances (Ontario Bill 208), hazardous substances (Canada Labour Code Part II Section 10), and before painting, caulking, or using adhesives.

1.10 TEMPORARY UTILITIES

.1 Existing services required for work may be used by the Contractor without charge. Ensure capacity is adequate prior to imposing additional loads. Connect and disconnect at own expense and responsibility.

.2 Connect to existing power supply in accordance with Canadian Electrical Code.

.3 Notify the Departmental Representative and utility companies of intended interruption of services, obtain requisite permission.

.4 Give the Departmental Representative 48 hours notice related to each necessary interruption of any mechanical or electrical service throughout the course of the work. Keep duration of these interruptions to a minimum. Carry out all interruptions after normal working hours of the occupants, preferably on weekends.

1.11 REMOVED MATERIALS

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

1.12 PROTECTION

.1 Protect finished work against damage until take-over.

.2 Protect adjacent work against the spread of dust and dirt beyond the work areas.

.3 Protect operatives and other users of site from all hazards.

1.13 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to the normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated. Refer to article 1.32 Scheduling below for work that must be done during "off hours".

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provides temporary means to maintain security.

.4 Where elevators, dumbwaiters, conveyors or escalators exist Contractor may use these at Departmental Representative's discretion. Protect from damage, safety hazards and overloading of existing equipment.

.5 Closures: Protect work temporarily until permanent enclosures completed.

1.14 SITE STORAGE

.1 The Departmental Representative will assign storage space which shall be equipped and maintained by the Contractor.

.2 Do not unreasonably encumber site with materials or equipment.

.3 Move stored products or equipment which interferes with operations of Building System Technician or other contractors.

.4 Obtain and pay for use of additional storage or work areas needed for operations.

1.15 CUT, PATCH and MAKE GOOD

.1 Cut existing surfaces as required to accommodate new work.

.2 Remove all items so shown or specified.

.3 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative's approval. Match existing material, colour, finish and texture.

.4 Install firestops and smoke seals in accordance with “ULC-S115-05 – Standard Method of Fire Test of Firestop Systems”, around pipe, ductwork, cables and other objects penetrating fire separations to provide fire resistance not less than the fire resistance rating of surrounding floor, ceiling and wall assembly.

1.16 EXAMINATION

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

1.17 SIGNS

.1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, and etcetera, in both official languages or by the use of commonly-understood graphic symbols to the Departmental Representative's approval.

.2 No advertising will be permitted on this project.

1.18 ACCESS AND EGRESS

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

1.19 SCAFFOLDS AND WORK PLATFORMS

.1 Designs, install, and inspect scaffolds and work platforms required for work in accordance with relevant municipal, provincial and other regulations.

.2 Provide design drawings, signed and sealed by qualified Professional Engineer licensed in the province of Ontario, where prescribed.

.3 Additions or modifications to scaffolding must be approved by Professional Engineer in writing.

1.20 PUBLIC WAY PROTECTION

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

1.21 WASTE MANAGEMENT

.1 Comply with the Environmental Protection Act, Ontario Regulations O.Reg. 102/94 and O. Reg. 103/94 for waste management program on construction and demolition projects.

.2 Provide a "source separation program" to disassemble and collect in an orderly fashion "materials designated for alternative disposal" from the "general waste" stream.

.3 Submit complete records of all removals from site for both "materials designated for alternative disposal" and "general waste" including:

.1 Time and date of removal.

.2 Description of material and quantities.

.3 Proof that materials have been received at an Approved Waste Processing Site or certified Waste Disposal Site as required.

1.22 RECORDS

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

1.23 GUARANTEES AND WARRANTIES

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

1.24 CLEAN UP

.1 Clean up work area as work progresses. At the end of each work period and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.

.2 Upon completion removes scaffolding, temporary protection and surplus materials. Make good defects noted at this stage.

.3 Clean manufactured articles in accordance with manufacturer’s directions.

.4 Clean areas under contract to a condition at least equal to that previously existing and to approval of Departmental Representative.

1.25 BUILDING SMOKING ENVIRONMENT

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

1.26 DUST CONTROL

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of work and public.

.2 Maintain and relocate protection until such work is complete.

.3 Protect all furnishings within work area with 0.102¦mm thick polyethylene film during construction. Remove film during non- construction hours and leave premises in clean, unencumbered and safe manner for normal daytime function.

1.27 TESTING LABORATORY SERVICES

.1 Departmental Representative will appoint and pay for costs of inspection and testing services, unless indicated otherwise.

.2 Provide safe working areas and assist with testing procedures, including provisions for materials or services and co-ordination, as required by testing agency and as authorized by Departmental Representative.

.3 Where tests indicate non-compliance with specifications, contractor to pay for initial test and all subsequent testing of work to verify acceptability of corrected work.

1.28 SCHEDULING

.1 On award of contract submit bar chart construction schedule for work, indicating anticipated progress stages within time of completion. When schedule has been reviewed by the Departmental Representative, take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.

.2 Carry out work during "regular hour" Monday to Friday from 07:00 to 18:00 hours and on Saturdays, Sundays and statutory holidays.

.3 Carry out interior painting in occupied areas during "off hours" Monday to Friday from 18:00 to 07:00 hours and on Saturdays, Sundays, and statutory holidays. Thoroughly ventilate areas painted during "off hours".

.4 Give the Departmental Representative 48 hours notice for work to be carried out during "off hours".

1.29 COST BREAKDOWN

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

1.30 PRECEDENCE

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 General

1.01 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
.1 CCDC 2-2008, Stipulated Price Contract.

1.02 ADMINISTRATIVE

.2 Submit to Departmental Representative submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.3 Prepare submittals log, listing all shop drawings, samples and product data sheets submittals required as part of the contract. List status of each submittal, from submission to final approval. Submit updated submittals log at each progress meeting.

.4 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.5 Where items or information is not produced in SI Metric units, converted values are acceptable.

.6 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.

.7 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.8 Verify field measurements and affected adjacent Work are coordinated.

.9 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative’s review of submittals.

.10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review, unless Departmental Representative gives written acceptance of specified deviations.

.11 Keep one reviewed copy of each submission on site.

1.03 SHOP DRAWINGS AND PRODUCT DATA

.1 Refer to CCDC 2 GC 3.10.

.2 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.

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

.4 Allow three days for Departmental Representative's review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes on shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.

.7 Accompany submissions with transmittal letter, containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions shall include:
- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Contractor.
  - .2 Subcontractor.
  - .3 Supplier.
  - .4 Manufacturer.
  - .5 Separate detailer when pertinent.
- .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 Relationship to adjacent work.

.9 After Departmental Representative's review, distribute copies.

.10 Submit one (1) electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.11 Submit one (1) electronic copy of product data sheets or brochures for requirements requested in specification Sections, and as requested by Departmental Representative, where shop drawings will not be prepared due to standardized manufacture of product.

.12 Delete information not applicable to project.

.13 Supplement standard information to provide details applicable to project.

.14 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.04 SAMPLES

.12 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.13 Deliver samples prepaid to Departmental Representative's business address.

.14 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.15 Where colour, pattern or texture is criterion, submit full range of samples.

.16 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.17 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

.18 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.05 MOCK-UPS

.19 Construct field samples and mock-ups at locations acceptable to the Departmental Representative.

1.06 PROGRESS PHOTOGRAPHS

.20 Submit progress photographs in accordance with Section 01 00 10 - General Instructions.

1.07 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Transcription of Insurance.

PART 2 Products

2.1 NOT USED

.21 Not Used.

PART 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

1.1 Safety Regulations

.1 The Contractor shall comply with the latest edition and amending regulations of the following documents, and in the case of conflicts between documents, the more stringent rule shall apply:

.1 *The Occupational Health and Safety Act – Revised Statutes of Ontario, Revised Regulation 851/90*, amended to *O. Reg 488/01*.

.2 *Hazardous Projects Act and the Canada Labour Code*, most recent edition.

.3 *Occupational Health and Safety Regulation for Construction Projects, Revised Statutes of Ontario, Regulation 213-91* as amended by *O.Reg.527/00*.

.4 *The Workplace Safety and Insurance Act, 1997 as amended by 1997,c.26, Sched.; 1998, c. 36; 1999, c.6, s. 67; 2000, c. 26, Sched. I; 2001, c. 9, Sched. I, s. 4; 2002, c.8, Sched. P, s.8; 2002, c. 18, Sched. J, s. 5.*

.5 *Ontario Building Code Act S.O. 2006, c. 23*, and *Ontario Regulation 403/97* as amended to *O. Reg. 220/02*.

.6 *The Ontario Fire Code, O. Reg. 388/97* as amended by *315/01.*

.7 Regulation 447 - Environmental Protection Act.

.8 *Workplace Safety and Insurance Board, Regulation 1101, First Aid Requirements*.

.9 *National Building Code 2010, Part 8: Safety Measures at Construction and Demolition Sites.*

.10 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.

1.2 Temporary Stairs, Hoists, Scaffold, etc.

.1 Furnish and maintain all equipment such as stairs, ladders, ramps, scaffolds, swing stages, hoists, runways, derricks, chutes, elevators, etc., as required for proper execution of work.

.2 Construct and maintain scaffolding in rigid, secure and safe manner. Erect scaffolding independent of walls. Remove promptly when no longer required.

.3 Provide all necessary temporary barricades, fencing, guardrails, night lights, overhead protection and barriers as necessary for the work.

.4 Where such structures are of a complicated nature, employ the services of a Registered Professional Engineer to design such scaffolding, framework, or other temporary supports.

1.3 Fall Protection

.1 Comply with Occupational Health and Safety Act and Regulations for Construction Projects, Section 26, as described herein but not limited too:

.1 Fall protection will be required when a worker is exposed to a fall of

more than
3 metres.

.2 Fall protection shall be in the form of:

a. Guardrail system
b. Travel restraint system
c. Fall restricting system
d. Fall arrest system

.3 The components of any system listed above shall be designed by a professional engineer in accordance with good engineering practice, and shall meet the requirements of any of the National Standards of Canada that are applicable.

.2 A wood guardrail system shall consist of a top rail, intermediate rail, and a toe board. The top rail shall be located at least 0.9m but no more than 1.1m above the surface on which the system is installed. The toe board shall extend at least 89mm above the surface on which the system is installed. The maximum distance between two adjacent posts of the guardrail system shall be 2.4m. Wood shall be SPF construction grade quality or better. Members shall be at least 38mm by 89mm. Members to resist prescribed point loads.

.3 A travel restraint system shall consist of a full body harness (with adequate attachment points) or a safety belt. The full body harness or safety belt shall be attached by a lifeline or lanyard to a fixed support able to resist the prescribed static and dynamic forces.

.4 A fall restrict system shall consist of assembly of components attached to a fixed support able to resist the prescribed static and dynamic forces. Worker's free fall distance must not exceed 0.6m.

.5 A fall arrest system shall consist of a full body harness with adequate attachment points and a lanyard equipped with a shock absorber. The fall arrest system shall be attached by a lifeline or lanyard to a fixed support able to resist the prescribed static and dynamic forces. The fall arrest system shall be arranged so that a worker cannot hit the ground or an object or level below the work. The worker who falls shall not be subjected to a fall arrest force greater than 8 kilonewtons.

1.4 Site Fencing

.1 All equipment, machinery and materials stored on the ground must be cordoned off with a solid fence.

.2 Ground areas below area of work on the roof must be fenced off to keep all pedestrian traffic a minimum of 4.5m from building. Fence shall be a minimum of 1.8m in height.

1.5 Safety and Security Requirements

.1 Enforce use of CSA approved hardhats and safety boots for all entering or working on construction site.

.2 The Contractor shall remove from the site any persons not observing or complying with safety requirements.

.3 The Contractor will report to the Departmental Representative, and jurisdictional authorities, any accident or incident involving the Contractor, the Departmental Representative's staff, or the public; personnel and/or property, arising from the Contractor's execution of the work.

.4 The Contractor will include all provisions of the Contract in so far as they are pertinent in any agreement with Sub-contractors, and hold all Sub-contractors equally responsible for safe work performance.

.5 Delays in the progress of the Work arising out of infractions of legislation or Contract health and safety requirements are the responsibility of the Contractor.

.6 Provide and maintain adequate lighting where workmen or public may be subject to hazards and in all working areas.

.7 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, and regarding labelling and the provision of material safety data sheets.

.8 In addition to the requirements of the Occupational Health and Safety Act, and Regulations for Construction Projects, provide temporary safeguards and protection against:

.1 Accident or injury to any workmen or other persons on the site, adjacent work and property, roads and walks.

.2 Damage to any part of the work and to any adjoining or adjacent structure, properties, pavements, walks, services, and other similar items by frost, weather, overloading, and any other cause resulting from the execution of the work.

.9 Make good with material identical with existing and adjoining surfaces any damage resulting from the execution of the work to any part of the work or any buildings, pavements, landscaping, poles, hydrants, services, etc., on or surrounding the site.

.10 Fire extinguisher must be on hand at all times when propane torch or other flame/heat producing device is being used.

.11 Adhere to Departmental Representative’s site specific Health and Safety policies, as applicable, which include the following:

.1 Use of hard hats and safety boots

.2 WHMIS: training, staff awareness of chemicals on site, emergency plan

.12 The Contractor shall be responsible to insure that all individual accessing the roof is properly trained in Fall Arrest and Fall Protection as required by the Ministry of Labour of Ontario. Anyone not in possession of a certification card should not be allowed on the roof.

.13 The Contractor shall abide by all Workplace Health and Safety regulations.

Should the Contractor, in the opinion of the Departmental Representative, fail to meet those regulations, ONE written warning will be given to the Contractor. Further non-compliance will be written in the inspection report and result in the notification of the Ministry of Labour by the Departmental Representative.

.14 The Contractor shall provide, in writing, a company safety plan and a site specific safety plan PRIOR to commencing any work.

END OF SECTION

PART 1 GENERAL

1.01 REFERENCES

.1 Federal Legislation.
- .1 Canadian Environmental Assessment Act (CEAA), 1992, c. 37.
- .2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- .4 Comply with National Building Code 2010 (Part 8).

1.02 DEFINITIONS

.1 Alternate Disposal: reuse and recycling of materials by designated facility, user or receiving organization which has valid Certificate of Approval to operate. Alternative to landfill disposal.

.2 Deconstruction: systematic dismantling of structure in a manner that achieves safe removal/disposal of hazardous materials and maximum salvage/recycling of materials.
- .1 Ultimate objective is to recover potentially valuable resources while diverting from landfill what has traditionally been significant portion of waste system.

.3 Demolition: rapid destruction of structure with or without prior removal of hazardous materials.

.4 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, including but not limited to: corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health, well being or environment if handled improperly.

.5 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.6 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form.
- .1 Recycling does not include burning, incinerating, or thermally destroying waste.

.7 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
- .1 Salvaging reusable materials from remodelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
- .2 Returning reusable items including pallets or unused products to vendors.

.8 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.9 Source Separation: acts of keeping different types of waste materials separate, beginning from first time they became waste.

.10 Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

1.03 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit pre-demolition audit and deconstruction/disassembly plan prior to starting work.

1.04 QUALITY ASSURANCE

.1 Ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable provincial regulations.

1.05 SITE CONDITIONS

.1 Existing Conditions.
- .1 Should materials resembling spray or trowel applied asbestos or other designated substance be encountered in course of deconstruction, stop work, take preventative measures, and notify Departmental Représentative immediately. Do not proceed until written instructions have been received.

.2 Protection.
- .1 Prevent movement, settlement or damage of adjacent structures, services, sidewalks, paving, trees, landscaping, adjacent grades. Provide bracing and shoring as required. Make good damage caused by deconstruction.
- .2 Support affected structures and, if safety of structure being deconstructed appears to be endangered, take preventative measures. Cease operations and immediately notify Departmental Représentative.
- .3 Prevent debris from blocking surface drainage system, mechanical and electrical systems, which must remain in operation. Protect drainage system within work area, and prevent debris, sand, etc from leaching into drain.

PART 2 PRODUCTS

2.01 NOT USED

.1 Not used.

PART 3 EXECUTION

3.01 PREPARATION

.1 Do Work in accordance with Section 01 35 30 - Health and Safety Requirements.

.2 Isolate and protect all active energized utility service lines for the duration of the work. Post warning signs on electrical lines and equipment which must remain energized to serve other products during period of demolition.

3.02 REMOVAL OF HAZARDOUS WASTES

.1 Prior to start of deconstruction work remove contaminated or hazardous materials from site and dispose of in a safe manner in accordance with applicable regulations.

3.03 DISASSEMBLY

.1 Unless specified otherwise, materials removed from structure are property of Contractor.

.2 Throughout course of deconstruction pay close attention to connections and material assemblies. Employ workmanship procedures which minimize damage to features designated to remain, materials and equipment.

.3 Ensure workers and subcontractors are trained to carry out work in accordance with appropriate deconstruction techniques.

.4 Project supervisor with previous deconstruction experience must be present on site throughout project.

.5 Deconstruct in accordance with the National Building Code, Part 8 and other applicable safety standards.

.6 Workers must utilize adequate fall protection.

.7 Maintain structural integrity of structure.

.8 Remove materials that cannot be salvaged for reuse or recycling and dispose of in accordance with applicable codes at licensed facilities.

.9 Extent of demolition shown on drawings.

3.04 REMOVAL FROM SITE

.1 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.

3.05 CLEANING AND RESTORATION

.1 Keep site clean and organized throughout deconstruction.

.2 Upon completion of project, remove debris, trim surfaces and leave work site clean.

.3 Upon completion of project, make good areas, walkways, affected by Work to condition which is indicated on the documents or otherwise existed prior to beginning of Work.

END OF SECTION

PART 1 GENERAL

1.01 REFERENCES

.1 American Concrete Institute (ACI)
- .1 ACI 347-04, Guide to Formwork for Concrete

.2 Canadian Standards Association (CSA)
- .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction.
- .2 CSA-O86-09, Engineering Design in Wood.
- .3 CSA O151-04, Canadian Softwood Plywood.
- .4 CSA O153-M1980 (R2008), Poplar Plywood.
- .5 CAN/CSA-S269.3-M92 (R2008), Concrete Formwork.

.3 Council of Forest Industries of British Columbia (COFI)
- .1 COFI Exterior Plywood for Concrete Formwork.

1.02 STORAGE

.1 Store formwork material so that it is not in contact with the ground and protected from water, oil, dirt or other contamination. Support so as to prevent warping or distortion.

1.03 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials at appropriate recycling facilities.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

.4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low VOC's.

PART 2 PRODUCTS

2.01 MATERIALS

.1 Formwork materials:
- .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O86.1 and CSA-O153. Use new materials throughout. All forms shall be sound, undamaged sheets with clean true edges, sealed and factory treated with form sealer. Thicknesses as required to support concrete at rate poured with no bowing of forms between supports.

.2 Steel Forms: Minimum 16ga thick, stiffened to support weight of concrete with minimum of deflection.

.3 Grooves, reglets, chamfers and rustification strips: Use White Pine selected for straightness and accurately dressed to size. Provide 1 to 3 draw unless otherwise shown. Provide continuous saw-cut at back of strip. Chamfers at 45° unless noted.

.4 Form ties:
- .1 For exposed concrete surfaces, use snap-off ties, complete with plastic cones and light grey concrete plugs. Alternatively, fill tie holes with dry cement mortar and ram solid. Maximum spacing 600mm o.c.
- .2 Wire ties and wood spacers not permitted.

.5 Form liner:
- .1 Plywood: Canadian Softwood Plywood to CSA O151 Poplar to CSA O153, 2 grade, T and G edge, 16 mm thick.

.6 Joint tape for sealing panel joints: Tape must be capable of preventing leakage of concrete in form joints.

.7 Caulking for joints between panels: Use grey urethene catalyst cured non-sag or self-levelling sealant, as applicable.

.8 Form release agent: chemically active release agents containing compounds that react with free lime in concrete resulting in water insoluble soaps, preventing concrete from sticking to forms, non-toxic, biodegradable, low VOC.

.9 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 15 to 24 mm^2/s at 40°C, flashpoint minimum 150°C, open cup.

PART 3 EXECUTION

3.01 FABRICATION AND ERECTION

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Fabricate and erect falsework in accordance with COFI Exterior Plywood for Concrete Formwork.

.3 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1.

.4 Align form joints and make watertight. Keep form joints to minimum.

.5 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners of concrete members, unless specified otherwise.

.6 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.7 Build in sleeves and other inserts required to accommodate Work specified in other sections. Assure that all inserts will not protrude beyond surfaces designated to receive applied finishes.

.8 Provide access openings as required for cleaning and inspection of forms and embedded items, prior to placing concrete.

.9 Clean and prepare formwork surfaces in accordance with CSA-A23.1, before placing concrete. Apply form release agents to formwork in accordance with manufacturer's instructions, prior to placing accessories and reinforcement. Do not apply form release agent where concrete surfaces will receive special finishes or coating which are affected by the agents.

.10 Re-use formwork and falsework subject to requirements of CSA-A23.1. Do not re-use forms if there is any evidence of surface damage or wear which would impair the quality of the concrete surface.

.11 When formwork is to be re-used, apply non staining parting agent in accordance with CSA-A23.1.

.12 Construct formwork and falsework such that loads are not transmitted to an adjacent existing structure.

3.02 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.
- .1 Two days for walls.
- .2 Seven days for ramp slab.

.2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

.3 Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

.4 Space reshoring in each principal direction at not more than 3000 mm apart.

.5 Maintain shoring or re-shoring in position for 28 days minimum.

.6 Reshoring shall meet the requirements of ACI Standard 347.

.7 Remove forms without damage to concrete surfaces. Repair all blemishes by patching and sacking.

.8 Remove formwork from architectural concrete after other formwork has been removed to ensure that the architectural finish is not damaged.

3.03 QUALITY CONTROL ON-SITE

.1 Do not close deep forms until reinforcement has been reviewed.

.2 Check elevations, camber and plumbness of formwork continuously during concreting and after, until initial set occurs using pre-installed tell-tale devices. Appropriate adjustments shall be promptly made where necessary. Report all adjustments made after initial set to the Departmental Representative.

END OF SECTION

PART 1 GENERAL

1.01 RELATED SECTIONS

.1 Section 03 30 00 - Cast-in-Place Concrete.

1.02 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A82/A82M-07, Specification for Steel Wire, Plain for Concrete Reinforcement.
.2 ASTM A185/A815M-07, Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
.3 ASTM C1116/C1116M-06, Specification for Fibre-Reinforced Concrete and Shotcrete.

.2 Canadian Standards Association (CSA)
.1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Tests and Standard Practices for Concrete.
.2 CAN/CSA-A23.3-04, Design of Concrete Structures.
.3 CAN/CSA-G30.18-09, Carbon steel bars for concrete reinforcement.
.4 CAN/CSA-G40.20-04 /G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.5 CSA W186-M1990 (R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
.6 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 Reinforcing Steel Manual of Practice, Reinforcing Steel Institute of Canada.

1.03 SHOP DRAWINGS

.1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00- Submittal Procedures.

.2 Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacing, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings. Prepare reinforcement drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Canada.

.3 Detail lap lengths and bar development lengths to CSA-A23.3, unless otherwise indicated. Provide type B tension lap splices unless otherwise indicated.

.4 Do not release shop drawings for reinforcing bars whose length may be affected by field conditions, until such time as the governing field dimensions have been ascertained, and affected reinforcing bar lengths are revised.

.5 Make corrections required by previous review before re-submitting drawings. Do not add new details to drawings which have been reviewed.

1.04 SUBSTITUTES

.1 Substitute different size bars only if permitted in writing by Departmental Representative.

1.05 QUALIFICATIONS

.1 Welding of reinforcing bars shall only be undertaken by firms certified by the Canadian Welding Bureau in conformance with CSA W186.

1.06 STORAGE

.1 Store all reinforcement material on racks or skids so that it is protected from dirt and maintained in its fabricated form.

PART 2 PRODUCTS

2.01 MATERIALS

.1 Reinforcing steel: billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.

.2 Cold-drawn annealed steel wire ties: to ASTM A82

.3 Welded steel wire fabric: to ASTM A185. Provide in flat sheets only.

.4 Synthetic Fibres: Synthetic structural fibres engineered and designed for use in concrete pavement, complying with ASTM C1116, type 111, 50 mm long, minimum tensile strength as noted on drawings. Mixing procedure and density as per manufacturer's recommendations.

.1 Acceptable materials;

.1 Euclid Chemical Company; Tuf-Strand

.2 Grace Construction Products, W.R. Grace & Co.; Grace Fibres

.3 S1 Concrete Systems; Fibremesh.

.5 Chairs, bolsters, bar supports, spacers: to CSA-A23.1.

.6 Mechanical splices: subject to approval of Departmental Representative.

.7 Plain round bars: to CAN/CSA-G40.21. Grade 400. Smooth bars with sawed (not sheared) ends.

2.02 FABRICATION

.1 Fabricate reinforcing steel in accordance with CSA-A23.1, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

.2 Obtain Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

PART 3 EXECUTION

3.01 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.02 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CSA-A23.1.

.2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

.3 Ensure cover to reinforcement is maintained during concrete pour.

.4 Before placing, remove all loose scale, dirt, oil or other coatings which would destroy or reduce bond. Place reinforcement within the specified tolerances and secure in position by the use of chairs, spacers and hangers. Tie reinforcement securely together using 16 ga. annealed wire to prevent displacement during concrete placing and vibrating. Turn the ends of all ties towards the interior of the concrete. Use galvanized tie wire at all exposed and at all exterior locations.

.5 No splicing of reinforcement is permitted unless indicated on the Drawings. Do not cut reinforcement to permit placing of embedded items.

.6 Lap end cross wires of welded wire fabric but make lap at least 200 mm.

.7 Avoid passage of heavy equipment over reinforcing steel in place.

.8 Reset immediately, reinforcing steel displaced during concrete pour.

.9 Add fiber reinforcing to the concrete mix, prior to pouring concrete, as per manufacturer's instructions.

3.03 QUALITY CONTROL ON-SITE

.1 Reinforcement must be complete, adequately supported, tied and properly positioned for cover in advance of the time scheduled for casting concrete.

.2 Notify Departmental Representative for inspection of reinforcement prior to enclosing the reinforcement in the forms. Provide minimum 24 hours notice for inspection to occur.

END OF SECTION

PART 1 GENERAL

1.01 RELATED SECTIONS

.1 Section 03 20 00 – Concrete Reinforcing

1.02 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
- .1 ASTM C494-08a, Specification for Chemical Admixture for Concrete.
- .2 ASTM D1751-04, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 19.24 M90, Multi-component, Chemical Curing Sealing Compound.

.3 Canadian Standards Association (CSA International)
- .1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction.
- .2 CAN/CSA-A3000-08, Cementitious Materials Compendium.
- .3 CAN/CSA-G30.18-09, Carbon steel bars for concrete reinforcement.

1.03 QUALITY ASSURANCE

.1 Submit to Departmental Representative, minimum 1 week prior to starting concrete work:
- .1 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CSA-A23.1.
- .2 Proposed quality control procedures for cold weather concrete, curing and finishes.

.2 Record Documentation
- .1 Maintain a set of record drawings on site on which the progress of the work can be recorded.
- .2 Record the time and casting date for each section of concrete and the date for removal of each section of formwork.
- .3 When heat curing is required, record maximum and minimum daily temperatures outside the enclosure and the average temperature within each enclosure, for a period of 3 days after placing the concrete.
- .4 Record all modifications to the foundations and superstructure on a set of prints in a neat and legible manner. Use the information to make as-built (record) drawings at the completion of the work. Dimension all changes.

1.04 DELIVERY, STORAGE AND HANDLING

.1 Concrete hauling time: maximum allowable time limit for concrete to be delivered to site of Work and discharged not to exceed 120 minutes after batching.
- .1 Modifications to maximum time limit must be agreed to by the Departmental Representative and concrete producer as described in CSA A23.1/A23.2.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

1.05 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials at a designated recycling facility.

.2 Ensure emptied containers are sealed and stored safely.

.3 Unused admixtures and additive materials must not be disposed of into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

PART 2 PRODUCTS

2.01 MATERIALS

.1 Cement: to CAN/CSA A3001, Type GU.

.2 Supplementary cementing materials: To CAN/CSA A3000.

.3 Premoulded joint filler:
.1 Bituminous impregnated fibreboard: to ASTM D1751.

.4 Joint sealer/filler: grey to CAN/CGSB 19.24, Type 1, Class B.

.5 Sealer: boiled linseed oil.

.6 Other concrete materials: to CSA A23.1/A23.2.

2.02 MIXES

.1 Concrete mix for walls, foundations and ramp slab: Type C-1 concrete, including DCI corrosion inhibitor to ASTM C494.

.2 Ready-mixed concrete, produced in accordance with CSA A23.1, Clause 5.2.

.3 Heat concrete and deliver at a temperature conforming to CSA A23.1, Clause 5.2.4.4.

2.03 DOWEL AND HANDRAIL ANCHORAGE

.1 Set all dowels into concrete using adhesive.
.1 Acceptable materials:
.1 Hilti HY-150.
.2 Sika AnchorFix 3CA / 4CA.
.3 Simpson Strong-Tie Acrylic-Tie

.2 Set handrails into concrete using non-shrink grout.
.1 Acceptable materials:
.1 Sika Grout 212 SR.

PART 3 EXECUTION

3.01 PREPARATION

.1 Provide Departmental Representative 24 hours notice before each concrete pour.

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:
- .1 Development of cold joints not allowed.
- .2 Ensure concrete delivery and handling facilitates placing with minimum of rehandling, and without damage to existing structure or Work.

.4 Take precautions necessary to protect the existing structure from damage. Contractor is responsible for damage or claims for damage.

.5 Clean and remove stains prior to application of concrete finishes.

.6 Prior to placing concrete, obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

3.02 CONSTRUCTION

.1 Perform cast in place concrete work in accordance with CSA A23.1/A23.2.
- .1 Remove all water from formwork before placing concrete.
- .2 Clean all forms of debris and deleterious materials before placing concrete. Remove all contaminants which lessen bond of concrete to reinforcement prior to placing concrete.
- .3 Adjust reinforcement immediately before concrete is placed to ensure that all bars are secured in their correct positions. Arrange to have a crew of reinforcing setters on hand as concrete is placed in order to make any last minute adjustments that are required.
- .4 Use form vibrators for thin sections where roding, spading or the use of internal vibrators is impractical. Attach vibrators firmly to the forms and so spaced that the complete lift of concrete is visibly affected.
- .5 Platform and screed type vibrators may be used to ensure a dense top surface where this cannot be obtained by the use of the internal equipment. Obtain approval from the Departmental Representative before using platform or screed type vibrators.
- .6 Do not place concrete in the rain. Protect exposed surfaces from rain or other adverse weather conditions until final set occurs.
- .7 The maximum average time from charging the mixer to final deposit is 60 minutes, the maximum individual time from charging the mixer to final deposit is 90 minutes. Do not add water to the mix without the expressed approval of the Departmental Representative.
- .8 Provide minimum slope to concrete surface as noted on drawings.
- .9 Where concrete is rejected by the Departmental Representative, refer to clause entitled "Field Quality Control".

3.03 INSERTS

.1 Cast in sleeves, reinforcement, frames, waterstops, joint fillers and other inserts required to be built in.
  .1 Sleeves and openings greater than 100 mm x 100 mm not indicated, must be reviewed by Departmental Representative.

3.04 FINISHES

.1 Formed surfaces in accordance with CSA A23.1/A23.2., Clause 7.7.

.2 Use procedures as noted in CSA A23.1 to remove excess bleed water.

.3 Exposed site concrete:
  .1 Screed to plane surfaces and use wood floats.
  .2 Provide round edges and joint spacings using standard tools.
  .3 Trowel smooth to provide lightly brushed non slip finish.
  .4 Provide a distinctive pattern to demarcate the beginning and end of the ramp.

.4 Provide monolithic trowelled finish on all exposed slabs, lightly broomed.

3.05 ISOLATION JOINTS

.1 Install premoulded joint filler in isolation joints full depth of slab flush with finished surface to CSA A23.1/A23.2.

3.06 CURING

.1 Provide curing and protection for concrete to CSA A23.1, Clause 7.4.

.2 Use curing compounds compatible with applied finish on concrete surfaces free of bonding agents and in accordance with CSA A23.1/A23.2.

.3 Do not pile, store or transport materials over slabs until concrete has been in place for at least 7 days.

.4 Do not use combustion heaters of any kind in the presence of new concrete during construction.

.5 Shrinkage cracking as a result of improper curing will be cause for rejection of the concrete element in question. The concrete must be removed and replaced at no cost to the Owner.

3.07 SEALING

.1 Following curing, apply two even coats of linseed oil mixture to clean dry surfaces, each at 8 m^2/L. Allow first coat to dry before applying second coat.

3.08 SITE TOLERANCES

.1 Concrete slab finishing tolerance in accordance with CSA A23.1/A23.2.

.2 Use laser-screed technology for placing and finishing concrete.

3.09 FIELD QUALITY CONTROL

.1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Departmental Representative in accordance with CSA-A23.1.

.2 Departmental Representative will pay for costs of tests.

.3 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.4 Non-destructive Methods of Testing Concrete in accordance with CSA-A23.1. Reports will be made on form conforming to CSA-A23.1, Annex B.

.5 Inspection or testing by Departmental Representative will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

.6 Payment for additional testing including testing of the structure and its performance, and load testing required by changes of materials or mix design requested by the Contractor, and failure of completed work to meet specified requirements and testing, shall be made at the Contractors expense.

.7 Notify the Testing Laboratory as to the concreting schedule. Provide samples and standard test cylinders.

.8 Provide a group of three test cylinders for each standard strength test. Once cylinder will be tested at 7 days and two at 28 days.

.9 Take samples of the discharge end of the pipe when concrete is pumped. Take samples prior to the addition of fibres and plasticizing admixtures to the concrete.

.10 The percentage of entrained air will be determined and reported for concrete requiring an air entraining agent.

.11 In cold weather conditions, where concrete is exposed to temperatures below +5 degrees C, carry out non-destructive testing to CSA-A23.2, Annex A and related ASTM Standards to determine concrete strength prior to stripping formwork. Report results to the Departmental Representative.

.12 The independent concrete inspection and testing agency will evaluate and report upon the proposed equipment, mixing and quality control procedures and storage arrangements planned for site mixed concrete for concrete construction. Minimum acceptable standard of quality is CSA A23.1.

.13 Concrete tests:

.1 One standard strength test is required for each 20 m^3 of concrete placed, but not less than one test for each mix design of concrete placed each day. For non-critical concrete pours under 5 m^3 in size, no test is required. The Departmental Representative must make the decision, as to what is “non-critical” concrete. Store cylinders in metal lined curing boxes maintained at a temperature of not less than 10 degrees C until shipped to the testing laboratory. Store additional cylinder required for cold weather conditions adjacent to work for 7 days. The 7 day test shall show not less than 60% of the 28 day requirements.

.2 One standard air entrainment test is required for each 50 m^3 of air-entrained concrete or portion thereof placed each day. Test in accordance with CSA-A23.2.

.3 Make slump tests in accordance with CSA-A23.2, Test Method A23.2-5C, with each standard strength test and when so directed by the Departmental Representative.

.4 Ship test cylinders with completed shipping tag attached. Provide identification and sufficient information to correlate the cylinder to the information taken by the testing agency, to complete the report form as per Annex B, CSA-A23.2.

.14 Install thermometers for recording temperatures when concrete is placed under cold weather or hot weather conditions.

.15 Ensure that supervisory personnel are on hand when concrete is being cast so that the placing and curing procedures of the specification will be properly observed.

.16 Immediately cease further concrete placement on advice that concrete already in place has been rejected by the Departmental Representative. Replace rejected work in a manner approved by the Departmental Representative and at the Contractor's expense. Make good cracking or finish not accepted by the Owner or the Departmental Representative, to their satisfaction, at no additional cost to the Owner.

3.10 CLEANING

.1 Use trigger operated spray nozzles for water hoses.

.2 Designate cleaning area for tools to limit water use and runoff.

.3 Remove rubbish and surplus materials from the site.

END OF SECTION

PART 1 GENERAL

1.01 RELATED SECTIONS

.1 Section 04 03 08 – Historic – Mortaring.

.2 Section 04 05 10 – Common Work Results for Masonry.

.3 Section 04 05 19 – Masonry Anchorage and Reinforcing.

1.02 MEASUREMENT PROCEDURES

.1 Unit Prices
  .1 Provide unit rates for each of the repairs identified on the drawings, including repointing work. The unit cost for repair, includes all costs necessary to complete the specific repair, including additional scaffold, where required.

1.03 REFERENCES

.1 American Society for Testing and Materials (ASTM)
  .1 ASTM A276-08, Standard Specification for Stainless Steel Bars and Shapes

.2 Canadian Standards Association (CSA)
  .1 CSA A23.1-04A23.2-09, Construction Materials and Methods of Concrete Construction.
  .2 CSA-A371-04, Masonry Construction for Buildings.

1.04 DEFINITIONS

.1 Raking: the removal of loose/deteriorated mortar until sound mortar is reached.

.2 Backpointing: filling of masonry joints for the full depth, from which mortar is missing or has been raked out.

.3 Finishpointing: filling and finishing of masonry joints from which mortar has been raked out.

.4 Tooling: finishing of masonry joints using tool to provide final contour.

.5 Repair: using adhesives to rebond sections of fractured masonry.

.6 Consolidation: strengthening masonry units to prevent deterioration (spalling).

.7 Descaling: the removal of loose portions of the masonry (usually spalled area) through impact with a bush hammer or similar device.

.8 Core: that portion of stone masonry wall located between the outer and inner stone wythes, and consisting of mortar and small stones.

1.05 SYSTEM DESCRIPTION

.1 Work of this Section includes but is not limited to:
- .1 Visually inspecting for obvious signs of deteriorated masonry.
- .2 Raking all joints, and as noted on Drawings.
- .3 Preparation of masonry surface including joints, surface cleaning, flushing of voids and open joints, and masonry wetting.
- .4 Repointing of all masonry joints, including backpointing and finishpointing.
- .5 Removal of loose portions on stone surface.
- .6 Resetting of dislodged masonry units.
- .7 Ensuring cure of mortar.
- .8 Grouting by hand, small voids.
- .9 Consolidation of fractured masonry units or spalled units.
- .10 Replacement of deteriorated or missing units.

1.06 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit labelled samples of materials used on project for approval before work commences.

1.07 QUALIFICATIONS

.1 All masons shall be qualified in accordance with Section 04 05 10 – Common Work Results for Masonry.

.2 One thoroughly experienced, reliable and competent worker shall be in charge of all mortar mixing for the duration of the project. The experience must include mixing mortar for a minimum of three projects similar to this project. Contractor to identify this individual to Departmental Representative at start of project.

1.08 MOCK-UPS

.1 Construct mock-up in accordance with Section 01 33 00 – Submittal Procedures.

.2 Construct mock-up 1.0m x 1.0m to demonstrate repair procedure for each type of masonry material specified.
- .1 Raking out of joints.
- .2 Backpointing of joints.
- .3 Finishpointing of joint.

.3 Construct mock-up under supervision of Departmental Representative to demonstrate a full understanding of specified procedures, techniques and formulations are achieved before work commences.

.4 Construct mock-up where directed.

.5 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with masonry repointing and repair work.

.6 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.09 DELIVERY, STORAGE AND HANDLING

.1 Store cementitious materials and aggregates in accordance with CSA A23.1.

.2 Keep material dry. Protect from weather, freezing and contamination.

.3 Ensure that manufacturer's labels and seals are intact upon delivery.

.4 Remove rejected or contaminated material from site.

1.10 PROTECTION

.1 At end of each working day, cover unprotected work with waterproof membranes. Membranes should extend to 0.5 m beyond the perimeter of the work area and be tightly installed to prevent finished work from drying out too rapidly.

.2 Protect adjacent finished work against damage which may be caused by on-going work.

.3 All methods of enclosure and protection shall be to the approval of the Departmental Representative.

.4 Newly laid mortar shall be protected from excessive exposure to rain and full sunlight until the surface is thumb-print hardened.

.5 Provide and maintain protection for masonry walls at all times when work is suspended to prevent water from entering partially repointed masonry.

.6 Protection shall consist of nonstaining 6mil polyethylene sheets, or tarpaulins over burlap, secured to prevent lifting in high winds.

1.11 EXISTING CONDITIONS

.1 Report in writing, to Departmental Representative areas of deteriorated masonry revealed during work. Obtain Departmental Representative's approval and instructions of repair and replacement of masonry units before proceeding with repair work.

1.12 ENVIRONMENTAL REQUIREMENTS

.1 When temperature is 5°C or less:
- .1 Store cements and sands for immediate use within heated enclosure. Allow these materials to reach minimum temperature of 5°C (that is equilibrium with air temperature in enclosure).
- .2 Heat water to minimum of 20°C and maximum of 30°C:
  - .1 At time of use temperature of mortar to be minimum of 15°C and maximum of 30°C.

.2 Do not mix cement with water or with aggregate or with water-aggregate mixtures having higher temperature than 30°C.

.2 Protection requirements are specified in Section 04 05 10 - Common Work Results for Masonry.

.3 Obtain approval from Departmental Representative for methods of enclosure and protection.

PART 2 PRODUCTS

2.01 MATERIALS

.1 Mortar materials: to Section 04 03 08 - Historic - Mortaring.

.2 Dowels: Stainless Steel, 12mm Diameter, to ASTM A276, Grade 304.

.3 Anchorage and reinforcing: to Section 04 05 19 – Masonry Anchorage and Reinforcing.

2.02 PROPORTIONS

.1 Proportions: to Section 04 03 08 - Historic - Mortaring.

2.03 MORTAR

.1 Mortar: to Section 04 03 08 - Historic - Mortaring.

PART 3 EXECUTION

3.01 GENERAL

.1 Perform work in accordance with CSA-A371. Extent of raking out and repointing is as noted on the Drawings.

.2 Use manual raking tool unless otherwise specified to remove deteriorated mortar and ensure that no masonry units are chipped/altered/damaged by work to remove mortar. Tools for cutting out must be narrower than the joint.

.3 Tool and compact using jointing tool to force mortar into joint.

.4 For backpointing in deep, narrow joints, fabricate long stainless steel packing tools, to force mortar into the joints and compact it.

.5 Finish joints to match existing joints, except where specified otherwise.

.6 Use suitable approved jointing tool to form compacted joints. Tool length for finishpointing not to exceed 50 mm.

3.02 REPOINTING

.1 Raking joints:
- .1 Rake out all joints as noted on drawings.
- .2 Rake unsound joints free of deteriorated and loose mortar, dirt and other undesirable material.
- .3 All cutting out of joints is to be done with hammer and chisel, or air tools unless otherwise specified. Great care must be taken so as not to damage masonry units adjacent to joints. Cut away from the arrises to prevent spalling of the masonry. The use of power tools is only permitted, as noted.
- .4 Permission to use power tools will be based on the Contractor's ability to comply with the above conditions, in the mock-up.
- .5 If the contractor is found not to comply with these requirements, he will be required to remove all mortar by using hand tools, at no extra cost to the Owner.
- .6 Include removal of all existing excess mortar that may have been applied to stone face due to overpointing. Do not damage arris or finish on stone face.
- .7 Clean joints to full depth of deteriorated mortar but in no case to less than 40mm. Clean out voids and cavities encountered.
- .8 Clean by compressed air, surfaces of joints without damaging texture of exposed joints.
- .9 Flush open joints and voids; clean open joints and voids with low pressure water and if not free draining, blow clean with compressed air.
- .10 Fine joints (less than 4mm) need not be raked out more than 10mm, in order to reduce the danger of chipping the masonry edges. Use flat-bladed quirks and light hammers, hack-saw blades or similar tools to rake out joints.
- .11 Leave no standing water.
- .12 Damaged stone includes widening of existing joints, nicks, gouges and chipped or scratched surfaces from cutting out tools, resulting from improper workmanship. Any stone damaged as a result of careless raking, or saw cutting, shall be replaced at no cost to the Owner.
- .13 In no area can the joints be raked for more than four levels of scaffold in height, prior to backpointing, unless approved by the Departmental Representative.
- .14 If masonry unseats or bond is broken, remove unit and reset.

.2 Backpointing:
- .1 Where cut out joints are deeper than minimum raking out depths specified above, backpoint joints to bring mortar face to specified depth for raked out joints, in preparation for finishpointing. Where voids exist that conventional backpointing cannot fill, notify Departmental Representative for direction.
- .2 Immediately prior to pointing, thoroughly wet joints in order to control absorption.
- .3 Allow water to soak into masonry and mortar, leaving no standing water, but remaining wet.
- .4 For backpointing, fill all joints full with mortar, compacting firmly into joints to ensure positive adhesion to all inner surfaces. Place mortar in layers, max 30 mm thick, minimum 15 mm thick, allowing each layer to set to

thumb print hard before placing next layer. Bring face of mortar in backpointed joint to specified minimum depth for raked out joints, measured from the arris of the masonry unit. Leave ready for final pointing.

.5 Leave mortar square to stone face, and leave exposed stone each side of joint clean of mortar prior to mortar setting.

.6 For deep joints, provide stainless steel packing tools manufactured to permit the mason to compact mortar deep in the joints.

.7 Prevent mortar from being placed or smeared onto face of stone. Avoid mortar staining of masonry faces during backpointing.

.3 Finishpointing:

.1 When all required repair and replacement work is complete, carry out finishpointing.

.2 Before finishpointing, wash walls to be finishpointed and allow to dry to damp-dry condition. Ensure that all dust, mortar particles, and other debris is removed from joints and wall surfaces before finishpointing.

.3 Dampen joints and completely fill with mortar. If surface of masonry units/ stone has worn rounded edges, keep pointing back from surface to keep same width of joint. Keep joints back approximately 1 mm behind arrises. Avoid feather edges. Pack mortar solidly into voids and joints, to ensure positive adhesion to all inner surfaces.

.4 Keep masonry damp while pointing is being performed.

.5 Do no pointing in freezing weather. See Section 04 05 10, Common Work Results for Masonry for protection required for work in this Section.

.6 Build-up pointing in layers not exceeding 20mm in depth. Allow bottom layers to be thumbprint hard before applying subsequent layers. Pack and compress mortar into voids to fit approximately, but no less than 15mm thick. Maintain joint width.

.7 Remove excess mortar from masonry face before it sets.

.8 Allow mortar to set so that there is no free water that will cause run off on stone faces, then tool to match approved mock-up joints. Tool head joints, followed by horizontal joints. Do not overwork the face of the joints. Joints shall be uniform in appearance. Do not brush joints until they have set to the extent that brushing will not mark the joint surface.

.9 When mortar is thumbprint hard, finish joints with stippling action using a short stout bristle brush to compact the joint further, and produce a textured finish, exposing the aggregate.

.10 Retempering of Mortar:

.1 Portland cement-hydrated lime mortars should only be retempered once, and should be used within 2 hours of adding water to the mix when the air temperature is less than 25 degrees C. (1 ½ hours for higher temperatures)

.2 Do not retemper coloured mortars as it will affect the colour of the mortar.

.4 Curing:

.1 Moist cure freshly pointed joints by covering with moist burlap enclosure and polyethylene sheeting for minimum of 3 days after finishpointing. Keep wall and burlap misted.

.5 Protection

.1 Protect newly laid mortar from frost, rainfall or rapid drying conditions for 7 days.

3.03 DESCALING

.1 Remove loose masonry portions by impact with bush hammer as directed by Departmental Representative.

3.04 RESETTING

.1 Prepare slot to receive stones. Clean back all loose and deteriorated core to sound material.

.2 Repoint all void joints in back-up masonry. Replace deteriorated masonry as directed by Departmental Representative. Shave back-up masonry as necessary to reset stone.

.3 Build up core where more than 50 mm void exists behind stones to be reset. Build up in traditional manner with new stone offsets in mortar. Allow mortar to fully set up.

.4 Install new stainless steel spiral anchors built into back-up masonry, as directed.

.5 Install mortar on face of back-up masonry for collar joint, just prior to resetting stone.

.6 Fix dislodged masonry units in same location and orientation as originally set with water soaked hardwood wedges.

.7 Insert and compress firm mortar to within 50 mm of pointing surface. Allow mortar to set 24 hours.

.8 Pull out wood wedges when dried and shrunken.

.9 Backpoint in layers, and leave ready for finishpointing.

3.05 FIELD QUALITY CONTROL

.1 The Departmental Representative will inspect the quality of the work on a regular basis.

.2 Provide Departmental Representative with a minimum of 24 hours notice for required inspection.

.3 Approval of raked out condition of joints, and approval of backpointing mortar, must be received in writing by the contractor before the next procedure can proceed.

3.06 CLEANING

.1 Clean surfaces of mortar droppings, stains and other blemishes resulting from work of this contract as work progresses, and at the end of each working day.

.2 Do further cleaning after mortar has set and cured.

.3 Clean masonry with stiff natural bristle brushes and plain water only. Vinegar or chemicals are not to be used unless instructed in writing by Departmental Representative.

.4 Repoint masonry joints at anchor locations as scaffolding is removed.

.5 Remove all debris from stone faces, ledges and sills, as scaffolding is being removed.

END OF SECTION

PART 1 GENERAL

1.01 RELATED SECTIONS

.1 Section 04 03 07 - Historic - Masonry Repointing and Repair.

.2 Section 04 05 10 - Common Work Results for Masonry.

1.02 REFERENCES

.1 American Society for Testing and Materials (ASTM)
- .1 ASTM C144-11, Specification for Aggregate for Masonry Mortar.
- .2 ASTM C109/C109M-12, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars Using 50mm Cube Specimens.
- .3 ASTM C 207-06 (R20011), Specification for Hydrated Lime for Masonry Purposes.
- .4 ASTM C348-02, Test Method for Flexural Strength of Hydraulic-Cement Mortars.
- .5 ASTM C780-11, Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
- .6 ASTM C940-98a (2003); Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced Aggregate-Concrete in the Laboratory.

.2 Canadian Standards Association (CSA International).
- .1 CAN/CSA-A3000-08, Cementitious Materials Compendium.
- .2 CAN/CAN/CSA A179-04 (R2009), Mortar and Grout for Unit Masonry.

1.03 SUBMITTALS

.1 Product Data.
- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit five copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's mortar, grout, parging, colour additives and admixtures.

.2 Samples.
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit two 50 mm x 50 mm size samples of mortar.

.3 Prior to the mixing or preparation of mortars submit for approval to the Departmental Representative confirmation of source or product data sheet of:
- .1 Aggregate and Sand
- .2 Cements
- .3 Lime

.4 Manufacturer's Instructions.
- .1 Submit manufacturer's installation instructions.

1.04 QUALITY ASSURANCE

.1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties. Include the following:
- .1 Sand gradation testing in accordance with CAN/CSA A179.
- .2 Bulking of aggregate sample, in condition as delivered to site.
- .3 Vicat cone penetration: mortar mix.
- .4 Mortar compressive strength: at 7 days and 28 days, or otherwise required.

.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.4 Mock-ups: Construct mock-ups in accordance with Section 04 05 10 – Common Work Results for Masonry.

1.05 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material for recycling in accordance with local collection services.

1.06 SCHEDULING OF WORK

.1 Submit work schedule indicating anticipated progress stages within time of final completion shown in bid document.

.2 Take measures necessary to complete work within approved schedule time. Schedule may not be changed without approval.

1.07 ALTERNATIVES

.1 Obtain Departmental Representative’s approval before changing manufacturer’s brands or sources of supply of mortar materials during entire contract or other methods of mixing mortar specified elsewhere in this specification.

PART 2 PRODUCTS

2.01 MATERIALS

.1 Use same brands of materials and source of aggregate for entire project.

.2 Mortar and grout: to CAN/CSA A179.

.1 Aggregate: to CAN/CSA A179; gradation to ASTM C144. Use well graded aggregate passing 4.75mm down to 150 micron sieve where joints are greater than 6mm. Use aggregate passing 1.18mm down to 300 micron sieve where 6mm thick joints or less are indicated. In the event that the sand does not meet the noted gradation requirements, the contractor will be required to carry our additional sieving to meet the requirements or provide alternate sand.

.3 Colour: ground coloured natural aggregates or metallic oxide pigments. Colour of sand to match existing.

.4 Water: potable or from approved non-potable supply.

.5 Lime:

.1 Hydrated lime: ASTM C 207, type SA.

.6 Portland Cement: CAN/CSA-A3000, white, non staining, type GU.

.7 Calcium chloride is not to be used for any mortar.

.8 Grout for stonework: Hydraulic lime based injection and reinforcement grout, conforming to CAN/CSA A179, ASTM C348 and ASTM C940, control water content to conform to CAN/CSA A179, Clause 4.2.1.2 or Clause 4.3.1.5.

.9 Restoration mortar for crack repair and patching of stone:

2.02 PROPERTIES

.1 Bedding and pointing mortar for stonework: type O based on proportion specifications. Range for compressive strength; 4 MPa to 7 MPa at 56 days.

.1 Limestone: use 1:2½:7 cement: lime: aggregate mix for all joints below grade and to 1200 above grade

.2 Limestone: use 1:2½:8 cement: lime: aggregate mix for all other locations.

.3 For walls adjacent to footpaths and roadways, for joints within a margin of 1200mm above grade, add polymer latex admixture as per manufacturer's instructions.

.2 Jahn restoration mortar; premix to manufacturer's instructions.

.3 Vicat Cone Penetration for Stonework, to ASTM C780.

.1 Pointing Mortar; 15-20mm

.2 Bedding Mortar; 20-30mm

.4 Allowable air content for all Lime Mortars; 5% to 8%.

2.03 MIXES

.1 Do not add air entraining admixture to mortar mix.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.02 CONSTRUCTION

.1 Do masonry mortar and grout work in accordance with CAN/CSA A179 except where specified otherwise.

3.03 MIXING

.1 Prepare measuring boxes to ensure accurate proportioning of mortar ingredients. Each box to contain exact volume proportion for each specific mix ingredient.

.2 Introduce approximately 75% of the total volume of water into the mixer, followed by 50% of the sand and all of the dry hydrated lime. Mix for approximately 3 minutes or until the materials are thoroughly blended and no particles of white lime are apparent in the mix.

.3 Allow to stand for 5 minutes.

.4 Add the full volume of Portland cement, the remainder of the sand and water. Mix for further 3-5 minutes until thoroughly blended and mortar has reached consistency determined by Vicat Cone penetration testing.

.5 Add just sufficient water to obtain workable consistency for setting units. Avoid too wet a mix which stains the face of the work. Vicat Cone penetration may be slightly greater for bedding mixes, but should not exceed maximum value specified by more than 20%. Record water quantities and use for subsequent mixes to help ensure uniformity of all subsequent mixes.

.6 Adjust mix proportions based on percentage bulking shown in the test.

.7 All pointing mortar can be mixed using a regular paddle mixer. Only electric motor mixers are permissible. Mixers run on hydrocarbons are not permitted, due to fumes.

.8 Mixing by hand must be pre-approved by the Departmental Representative, as follows:

- .1 Hand mixing must be carried out using high speed 2500 Rpm drill, with paddle mixer attachment. Mixing to be completed in sufficiently small container so as to allow full contact of the paddle with the mortar during the mixing process, thus ensuring thorough incorporation of ingredients and air entrainment.
- .2 Submit masonry tools and container for approval prior to starting pointing work.

.9 Clean all mixing boards and mechanical mixing machine between batches.

.10 Mortar must be weaker than the masonry units which it supports.

.11 Mortar must not contain elements detrimental to the original masonry or surrounding materials.

.12 Contractor to appoint one individual to mix mortar, for duration of project. In the event that this individual must be changed, mortar mixing must cease until the new individual is trained, and mortar mix is tested.

3.04 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

.2 Remove droppings and splashings using clean sponge and water.

.3 Clean masonry with low pressure clean water and soft natural bristle brush. For limestone, pressure should be between 276 kPa and 410 kPa. See Section 04 03 07-Historic: Masonry Repointing and Repair.

3.05 SCHEDULE

.1 Use mortar matching existing mortar in adjacent walls in colour, where necessary, for finishpointing to minimum depth of 30mm.

.2 Use non-staining mortar for all repointing work.

3.06 PROTECTION OF COMPLETED WORK

.1 Cover completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day. Anchor securely in position.

3.07 FIELD QUALITY CONTROL

.1 Inspection and testing of mortar will be carried out by a Testing Laboratory designated by the Departmental Representative, to CAN/CSA A179.

.2 Owner will pay for cost of test as specified.

.3 Frequency of mortar testing will be specified by Departmental Representative.

.4 Air content to ASTM C185, for all lime mortars, and penetration using Vicat Cone for mortars used in stonework, must be tested at the same frequency as strength tests to ASTM C109, or more frequently as required by the Departmental Representative.

.5 Test sand and aggregate for bulking at start of project, at each new sand delivery, and at severe change in weather. Verify moisture content conforms to CAN/CSA A179.

.6 The Departmental Representative reserves the right to reject sand if bulked volumes are excessive.

END OF SECTION

PART 1 GENERAL

1.01 RELATED SECTIONS

.1 Section 04 03 07 – Historic – Masonry Repointing and Repair

.2 Section 04 03 08 – Historic Mortaring

.3 Section 04 03 42 – Historic – Replacement of Stone

1.02 MEASUREMENT PROCEDURES

.1 Provide unit prices for each of the repairs identified on the drawings. The unit price for each repair will include all costs necessary to complete the specific repair, including additional shoring, removal and reinstatement of existing stone, all anchorage, mortar and grout work necessary to stabilize adjacent masonry.

1.03 ALTERNATIVES

.1 Change of manufacturer's brands, sources of supply of materials during entire contract must be approved by Departmental Representative.

1.04 REFERENCES

.1 American Society for Testing and Materials (ASTM)
 .1 ASTM A276 – 08, Specification for Stainless Steel Bars and Shapes

.2 Canadian Standards Association (CSA)
 .1 CAN/CSA A179- 04 (R2009), Mortar and Grout for Unit Masonry.

1.05 DEFINITIONS

.1 Repair of Stone: any repair, other than cosmetic, i.e. superficial, and replacement, done to restore original appearance and function of partly deteriorated stones. Repairs include use of repair mortar for small chips and spalls, crack repair, Dutchman repair, fracture repairs and descaling.

.2 Filling: material used to rebuild broken or deteriorated part of stone.

.3 Grout: material used as adhesive to fasten broken/fractured stone elements by direct application at fracture interface and/or by application to added reinforcing elements such as dowels.

.4 Mortar: material used to repoint the adjacent mortar joints to stone element being repaired.

.1 Provide for all work to be done by skilled and experienced tradesmen specializing in the type of work specified.

.2 Only Jahn mortar certified installers will be acceptable.

1.06 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit grout and mortar samples to CAN/CSA A179.

1.07 MOCK-UPS

.1 Construct mock-up in accordance with Section 01 33 00 – Submittal Procedures.

.2 Construct mock-up of the following:
- .1 Two crack repairs
- .2 Two in-situ fracture repairs
- .3 One fracture repair, with stone removed.
- .4 Two stone restoration repairs.
- .5 One Dutchman repair.

.3 Construct mock-up where directed.

.4 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with stone repair work.

.5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.08 DELIVERY, STORAGE AND HANDLING

.1 Store materials in a dry area and supported free of ground.

1.09 ENVIRONMENTAL REQUIREMENTS

.1 Maintain temperature at 5ºC or above during and 48 hours after repair, throughout thickness of stone.

.2 Choose epoxy resin compatible with humidity condition of stone as specified by manufacturer.

.3 Provide for temporary enclosures and heating equipment to maintain specified temperatures. Take precautions to avoid overheating masonry.

1.10 EXISTING CONDITION

.1 Record and report to Departmental Representative site conditions non-conforming to those specified before beginning work.

PART 2 PRODUCTS

2.01 MATERIALS

.1 Materials for mortar and grout, see Section 04 03 08 – Historic – Mortaring.

.2 Water: clean and free of deleterious materials such as acid, alkali and organic material in accordance to CAN/CSA A179.

.3 Dowels: stainless steel threaded rod to ASTM A276, Grade 304.

.4 Deformed wire: stainless steel or equivalent non-corrosive metal, 2 mm diameter.

.5 Stone slabs: to have similar mechanical and aesthetic properties to existing, and in accordance with Section 04 03 42 – Historic – Replacement of Stone.

.6 Crack Filling: Dispersed Hydrated Lime (DHL), grout and shelter coat pigmented to match stone colour to approval of Departmental Representative.

.7 Epoxy Resin Gel: Acceptable product: Sikadur 31

.8 Restoration Mortar, see Section 04 03 08 – Historic – Mortaring.

2.02 MORTAR MIXES

.1 Mixes, see Section 04 03 08 – Historic – Mortaring.

2.03 SOURCE QUALITY CONTROL

.1 Retain purchase orders, invoices, suppliers test certificates and documents to prove that materials used in contract meet requirements of specification.

.2 Produce above upon request by Departmental Representative and allow free access to sources where materials were procured.

PART 3 EXECUTION

3.01 PREPARATION

.1 Remove decayed section of stones until sound surface is reached. Obtain Departmental Representative's approval for methodology and tools to be employed before commencing this work.

3.02 PROTECTION

.1 Prevent damage to building, landscaping, pavement, which are to remain. Make good any damage.

.2 Take utmost care not to damage historic fabric. Make good any damage.

3.03 CRACK REPAIR

.1 Drill 5 mm diameter injection ports as per injection grout manufacturer’s specifications.

.2 Clean out void with compressed air and potable water until water runs clear. Final flushing should be with a 10% ethyl alcohol solution.

.3 Seal joints and cracks to manufacturer's specifications.

.4 Complete injection procedure as per manufacturer's instructions. Keep surface of stone clean of spills. Clean off as work progresses.

.5 Allow grout to harden.

.6 Prepare DHL shelter coat using suitable pigments with the DHL grout.

.7 Inject shelter coat over crack fills. Apply in thin layers to bring out to surface.

3.04 REPAIR OF A FRACTURED STONE

.1 Remove existing stone, see Section 04 03 42, Historic – Replacement of Stone.

.2 Obtain Departmental Representative's approval for repair methodology before commencing work.

.3 Remove elements which require minor repair without losing pieces or worsening damage. Do not damage existing Work.

.4 Drill 13 mm diameter holes, 60 mm long in each section at fracture, maximum spacing at 300 mm on centre. Provide minimum two holes per stone. Clean dust out of hole using acetone and cotton swabs.

.5 Dampen stone surfaces prior to application of grout.

.6 Insert 12 mm diameter dowels, 100 mm long, and apply specified grout to holes and interface. Let grout cure for 24 hours minimum.

.7 Reinstate consolidated element into work.

.8 Reinsert stone, see Section 04 03 42, Historic – Replacement of Stone. Repoint with specified mortar. Joints to match existing. If fracture lines up with vertical mortar joints above and below the fractured stone, rotate the stone 180 degrees, if the pattern on the stone permits, and reinsert.

.9 Repair surface of fracture to match the surrounding stone, as per Article 3.03.

3.05 REPAIR OF FRACTURED STONE IN-SITU

.1 Drill 13 mm diameter holes, extend 60 mm beyond fracture, spaced at 300 mm on centre maximum, minimum 2 per stone. Confirm dowel size with Departmental Representative prior to drilling hole.

.2

.3 Clean dust out of hole using acetone and cotton swabs.

.4 Insert 12 mm diameter stainless steel dowels, 100 mm long and apply anchor setting mortar to holes and joints. Let set for 24 hours minimum.

.5 Repair surface of fracture as per Article 3.03.

.6 Finish surface of fracture to match colour and profile of existing stone.

3.06 REFACING PARTLY DETERIORATED STONE WITH SLAB (DUTCHMAN REPAIR)

.1 Remove decayed stone until sound surface is reached. Cut existing stone to square void in stone as much as possible, with minimum depth 50 mm.

.2 Select new stone to match surrounding stone colour, free from defects and with bedding to match adjacent work. Where possible, salvage from existing weathered stone on site.

.3 Using dowels as mechanical fasteners:
- .1 Drill 11mm diameter holes, 60mm long at interface of existing and new stone slabs. Where stone depth on either side of the interface is less than 100mm, length of hole to be 60% of stone thickness.
- .2 Dampen stone surface prior to application of grout.
- .3 Insert 10mm diameter dowels, 100mm long into existing stone and apply specified grout to holes and interface. Allow to set for 24 hours minimum. Where new or existing stone is less than 100mm thick, length of dowel to be 50% of the thickness of stone on each side of the interface.

.4 Using dovetailed grooves as mechanical fasteners:
- .1 Make horizontal dovetailed grooves 12mm deep at interface of existing and new stone slabs. Cut stone shape by hand using tempered chisels ensuring that the edges are not plucked or spalled.
- .2 Dampen stone surface prior to application of grout.
- .3 Apply specified grout to dovetailed grooves and interface of existing stone.

.5 Dampen stone surfaces. Fill dowel holes and/or dovetailed grooves of new stone slab with specified grout. Slot new stone slab into position. Secure stone temporarily to allow grout to set. Ensure joint between new and existing stone is filled solid and finished to match existing stone face.

.6 Leave face of Dutchman slightly proud and finish to original profile by rubbing back or tooling as required. Rubbing back marks on existing stone are not permitted.

.7 Repoint with specified mortar. Profile of joints to match existing.

3.07 REFACING PARTLY DETERIORATED STONE WITH FILLING (INCLUDING VOIDS, CHIPS, OLD PATCHES)

.1 Prepare and repair eroded stone using the specified cement-based mortar. Perform work in strict accordance with manufacturer's directions which shall be on hand during work and shall supplement and take precedence over this specification. Repairs shall match existing stone. The purpose of such work is required to improve water-shedding and to prevent further damage or erosion. Exact location and dimensions of repair will be chalked on stone by Departmental Representative.

.2 Remove decayed stone until sound surface is reached. Cut out areas to be repaired using a toothed chisel so that back surfaces are grooved and a square connection is made between restoration mortar and sound stone. Feathering of mortar is not acceptable. Cut away spalled and loose stone to a minimum depth of 6mm.

.3 After cutting, remove loose particles and clean space to be filled using water and brush so that all dust is removed. If surfaces to be restored chalk or become powdery, remove dust using a vacuum cleaner.

.4 After removing dust, moisten surfaces. Use only enough water to prevent the natural stone from extracting mixing water from the restoration mortar. Adjust amount of moisture to suit hardness and porosity of stone to be restored.

.5 Mix restoration mortar in a plastic tub using a hand mixer. Wear a dust mask. Put water in tub first before adding dry material. The ratio of water to dry material shall be as per manufacturer's directions.

.6 Apply mortar to suit nature of stone being restored. Restore stone surfaces to match existing and bring to the same plane as adjacent existing stone surfaces that are not eroded.

.7 Build up gradually new section in layers not exceeding 15 mm thickness allowing each layer to set before proceeding with next.

.8 Use wood float and avoid excessive trowelling to prevent crazing.

.9 Form roughly to shape with wood float leaving repair mortar proud, then chisel finish to final shape when mortar has set.

.10 Remove laitance with stiff, near dry, fibre brush.

.11 Moist cure restored surfaces for 4 days minimum. Apply moist cloth covered with plastic sheet. Maintain moisture in cloth by means of mist sprayer, for the entire curing period.

.12 Repoint mortar joints. See Section 04 03 07 – Historic – Masonry Repointing and Repair.

.13 Surface finish of patches must match existing stone in colour and texture.

3.08 SURFACE SPALLING STONE REPAIR

.1 Descale the surface of the stone, by removing loose masonry portions by impact with bush hammer, as directed by Departmental Representative.

.2 Where scaling is shallow (less than 2mm), bevel the edges of retained and firm surface plates to ensure water shedding.

.3 Where only a portion of the stone face requires descaling, clean the entire surface and repair the complete face to ensure uniformity of colour.

3.09 CLEANING

.1 Clean mock-up to demonstrate cleaning operations to Departmental Representative before starting cleaning work.

.2 Clean stone work surfaces after repairs have been completed and mortar has set.

.3 Clean stone surfaces of grout or mortar residue resulting from work performed without damage to stone or joints.

.4 Clear site of debris, surplus material and equipment, leaving work area in clean and safe condition.

3.10 PROTECTION OF COMPLETED WORK

.1 Protect finished work from impact damage for period of two weeks.

END OF SECTION

PART 1 GENERAL

1.01 RELATED SECTIONS

.1 Section 04 03 07 - Historic - Masonry Repointing and Repair.

.2 Section 04 05 10 - Common Work Results for Masonry.

.3 Section 04 05 19 – Masonry Anchorage and Reinforcing

.4 Section 07 92 10 – Joint Sealing.

1.02 UNIT PRICES

.1 Provide separate unit prices for replacement of stone: a) salvaged stone and b) new limestone. The unit price for replacement includes all additional shoring, removal and disposal of existing stone, all anchorage, mortar and grout work necessary to stabilize adjacent masonry, and to install the new/salvaged stone.

.2 Allow for waste required to achieve desired size of replacement stone.

1.03 REFERENCES

.1 American Society for Testing and Materials (ASTM)
  .1 ASTM C568-03, Specification for Limestone Dimension Stone

.2 Canadian Standards Association (CSA)
  .1 CAN/CSA A179-04 (R2009), Mortar and Grout for Unit Masonry.

1.04 SYSTEM DESCRIPTION

.1 Work of this section includes but is not limited to:
  .1 Stone removal, and reinstallation for both ramp sidewalls.
  .2 Replacement of deteriorated stone with new stone.
  .3 Supply and installation of new capstones.
  .4 Allow for cutting back existing stone to suit new wall.

1.05 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit shop drawings for all new stone required. Refer to drawings for locations.

.3 Drawings shall show all details for size, section, bedding, jointing, anchor or tying system and finish of stone.

.4 All moulded and profiled work details to be submitted full size.

1.06 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit samples of replacement stones not less than 5 days before masonry works begin.

.3 Samples from designated quarry: submit samples of replacement stones. Submit two sets of stone as follows:
1. Select samples from currently worked bed of quarry and accompanied by quarry certification.

.4 Samples should be representative of the full range of colour, visible markings, and finish to be supplied for the entire project. Indicate quarry bed or direction of bedding on samples.

1.07 QUALITY ASSURANCE

.1 The qualifications of the stone masons working on replacement of stone, must be in accordance with Section 04 05 10 – Common Work Results for Masonry.

.2 Make mason's workshop accessible to Departmental Representative for inspection of current work-in-progress.

.3 Employ workers specially trained and experienced in this type of work.

1.08 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver finished stone to site in substantial, purpose made containers, packed to avoid chipping damage or soiling from any means.

.2 Label each container to clearly indicate contents and location on building.

.3 Indicate on each stone quarry bed or direction of bedding and location of stone on building, referenced to shop drawings. Mark stones where not exposed with permanent markers.

.4 Avoid excessive handling, and protect against chipping, damage, soiling or staining.

.5 Damaged stone, and stone that is repaired prior to reaching site, will be rejected.

PART 2 PRODUCTS

2.01 MATERIALS

.1 New Stone: Stone to have similar mechanical and aesthetic properties to existing. The stone shall be the best selected quality stone, of uniform colour, texture, and strength, free from holes, shakes, cracks or other defects. Obtain approval from the Departmental Representative of sample replacement prior to purchasing the stone.

.2 New Limestone: Limestone to be Type II, medium density or better, to ASTM C-568. The following type of stone will be acceptable.
  .1 Acceptable material: limestone from:
    .1 Partly Dressed Stone for Capstone: Saint Marc Limestone (formerly known as Deschambeau Limestone), Greymont (Portneuf) Inc., 595 Boul. Dussault, Saint Marc, Quebec.G0A 4B0. Telephone: (418) 268-3584, Fax: (418) 268-5655.
    .2 Rubble Stone Partly Dressed for Walls: Champlain Limestone, Les Carriéres Ducharme Inc., 564 chemin Corey Hill, Havelock, Quebec, JOS 2C0. Telephone: (514) 247-2787, Fax: (514) 247-2908.

2.02 ANCHORS

.1 Dowels: stainless steel type 304. See Section 04 05 19 – Masonry Anchorage and Reinforcing.

2.03 STONE CUTTING

.1 Cut stone to shape and dimensions obtained from accurate measurements and profiles taken from existing stone.

.2 Ensure survey information is typical by taking profiles adjacent to location where new stone is to be set.

.3 Dress exposed faces true, make beds and joints same thickness as existing, but not to exceed 8mm thickness, and at right angles to face.

.4 Execute moulded work from full size details. Make exposed arises in true alignment and ease slightly to prevent snipping.

.5 Cut stones for anchors, cramps, dowels and support systems. Provide lewis pin and clamp holes in pieces which cannot be manually handled. Do not cut holes in exposed surfaces.

2.04 TOLERANCES

.1 Fabrication tolerances shall not exceed.
  .1 1.5 mm± on any dimension.
  .2 1.5 mm± deviation from square.
  .3 1.0 mm± deviation from flat surface on any exposed face.

2.05 BEDDING OF STONE

.1 All stone shall be supplied to be laid on its natural quarry bed with the following exceptions:
  .1 Arches: lay stones with bed at right angles to thrust.
  .2 Projecting, undercut members: to be edge-bedded.
  .3 As indicated on the drawings.

2.06 FINISHES

.1 Dress exposed surfaces of moulded work to match existing as follows:
.1 All finishes to match existing to approval of Departmental Representative.

2.07 FABRICATION OF REPLACEMENT STONE

.1 Record profile of existing stone.

.2 Cut and carve new stone to match existing profile.

.3 Obtain approval of new carved stone by Departmental Representative prior to installation.

PART 3 EXECUTION

3.01 PREPARATION

.1 Prevent absorption of ground water and exposure to rain.

.2 Move and lift stone units using means to prevent damage. Submit stone units dropped or impacted to Departmental Representative for inspection and approval. Do not make holes or indentations for Lewises or dogs on face or top side of stone.

.3 Indicate bedding planes of stone units. Duplicate bedding marks on usable pieces of cut stone.

.4 Place safety devices and signs near work area, as directed.

.5 Install shoring and supports as required.

.6 Cover adjacent plant material and fragile surfaces.

3.02 REMOVAL OF EXISTING STONE

.1 Areas of stonework designated for dismantling, must be recorded photographically, from each accessible face, prior to starting work.

.2 Using elevation drawings, accurately number each stone to be removed, and record its position. Numbering must correspond to the shop drawings.

.3 Where existing stone to be reset, mark stone on face, before removal, using marking product which can be completely erased when required, without damaging masonry unit.

.4 Use approved methods to loosen stones which will cause no damage either to stones or to other architectural elements.

.5 Do not use circular millstone or saw, pneumatic chisel, or steel tools exerting concentrated pressure on edge of stone. Obtain Departmental Representative's approval for use of power tools before commencing work.

.6 Loosen wet masonry only when temperature is above freezing point.

.7 Place detached stones on wood surfaces during handling. Prevent contact with metal or vegetation.

.8 Clean stone by wet scrubbing with vegetable fibre brush unless otherwise instructed by Departmental Representative. Do not use high pressure water jet.

.9 For stones to be reset, remove excess mortar by chisel.

3.03 CUTTING/SIZING OF STONE

.1 Use calipers, squares and levels to measure hole for new stone. Allow for mortar joints of 6 mm thickness maximum. Where existing joints are thinner, confirm joint thickness with Departmental Representative prior to cutting stone.

3.04 MOVING STONES

.1 Use Lewises to lift stones to working level.

.2 Move stones horizontally in wheelbarrows or on sleds.

.3 Move large stones using at least two nylon belts properly spaced to provide a safe and even bearing on the stone.

.4 Slide stones into place on wood ramps.

3.05 INSERTING NEW STONE

.1 Clean stone by washing with water and natural fibre brush before laying.

.2 Dampen surfaces of slot and apply mortar.

.3 Lay heavy stones and projecting stones after mortar in courses below has hardened sufficiently to support weight.

.4 Prop and anchor projecting stones until wall above is set.

.5 Set large stones on water soaked softwood wedges to support stone in proper alignment until mortar has set. Remove wedges when dry, do not break off.

.6 Insert and compress firm mortar to within 40 mm of pointing surface. Allow mortar to set 24 hours.

.7 Remove mortar dropping from face of stone before mortar is set. Sponge stone free of mortar along joints as work progresses.

.8 Use non-corrosive anchors to fix stone face plates as indicated. Provide minimum of two anchors per stone.

.9 Install anchors, dowels and cramps.

.10 Set stones plumb, true, level in full bed of mortar with vertical joints flushed full except where otherwise specified. Completely fill anchor, dowel and lifting holes and voids left by removed edges.

.11 Limestone must be laid in its natural bed.

.12 Grout solid all voids behind stone using specified grout.

3.06 PROTECTION

.1 Cover top of completed and partially completed wall, not enclosed or sheltered, with weatherproof coverings at end of each working day. Drape cover over wall and extend 0.5 m down both sides. Anchor securely in position. Prevent finished work from curing too quickly.

.2 Protect adjacent work from marking or damage due to work.

.3 Provide temporary bracing of masonry work during erection until permanent structure provides adequate bracing.

3.07 FILLING JOINTS/POINTING

.1 Fill joints and point: in accordance with Section 04 03 07 - Historic - Masonry Repointing and Repair.

.2 Keep new mortar wet for 3 days to cure.

END OF SECTION

PART 1 GENERAL

1.01 RELATED SECTIONS

.1 Section 04 03 07 – Historic – Masonry Repointing and Repair.

1.02 REFERENCES

.1 Canadian Standards Association (CSA International).
  .1 CAN/CSA A371-04 (R2009), Masonry Construction for Buildings.

1.03 SUBMITTALS

.1 Product Data.
  .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 – Submittal Procedures.

.2 Shop Drawings
  .1 Where existing masonry becomes laterally unsupported during construction, provide shop drawings for temporary bracing, stamped by a Professional Engineer registered in the Province of Ontario.

.3 Samples.
  .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
  .2 Submit samples.
    .1 One of each type of masonry anchor proposed for use.
    .2 One sample of each type of masonry accessory specified.
    .3 One sample of each type of Restoration mortar.
    .4 One sample of stone to be used to replace existing stone.
  .3 The approved samples shall become the standard material to be used.

.4 Manufacturer's Instructions.
  .1 Submit manufacturer's installation instructions.

1.04 QUALITY ASSURANCE

.1 Test Reports.
  .1 Submit certified test reports showing compliance with specified performance characteristics and physical properties.
  .2 Submit laboratory test reports in accordance Section 01 33 00 – Submittal Procedures.
  .3 Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements.

.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Mock-ups.
- .1 Construct mock-up panel of exterior masonry wall construction 1.0m x 1.0m minimum showing masonry colours and textures, use of anchors, jointing, mortar, tooling and workmanship.
- .2 For repointing, mock-up must include samples of saw-cut joints, raked joints, backpointed joints, and finishpointed joints, in both horizontal and vertical joints.
- .3 Mock-up will be used:
  - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
- .4 Construct mock-up where directed.
- .5 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with work.
- .6 When accepted by Departmental Representative, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.
- .7 Start work only upon receipt of written approval of the mock-up by the Departmental Representative

.4 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.5 All masons employed on this project must demonstrate the ability to reproduce the mock up standards.

1.05 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store, handle and protect materials in accordance with manufacturer’s requirements.

.2 Deliver materials to job site in dry condition.

.3 Storage and Protection..1 Keep materials dry until use.
- .2 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.06 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material for recycling in accordance with local collection services.

.3 Unused metal materials are to be diverted from landfill to a metal recycling facility as approved by Departmental Representative.

.4 Unused or damaged masonry materials must be diverted from landfill to a local facility as approved by Departmental Representative .

1.07 SITE CONDITIONS

.1 Site Environmental Requirements.
- .1 Cold weather requirements. Supplement Clause 6.7.2 of CAN/CSA A371 with following requirements.
  - .1 Maintain temperature of mortar between 5 degrees C and 30 degrees C until batch is used or becomes stable.
  - .2 Maintain ambient temperature between 5 degrees C and 30 degrees C and protect site from wind chill.
  - .3 Provide heating of masonry work when air temperature falls below 5 degrees C.
  - .4 Maintain temperature of masonry above 0 degrees C for a minimum of 14 days, after mortar is installed.
  - .5 Do not repoint if the temperature is forecast to drop below -5°C in the following 24 hours.
  - .6 Any unheated section of wall must be preheated in it's enclosure for a minimum period of 72 hours above 10 degrees C, before any mortar is applied.

.2 Hot weather requirements.
- .1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.
- .2 Protect masonry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.
- .3 Spray the mortar surface at intervals to keep it moist for a maximum of three days after installation.

.3 Maintain minimum/maximum thermometers and relative humidity gauges on site and maintain a daily record of temperature and humidity.

1.08 PERFORMANCE

.1 The following will be considered deficiencies in the work in addition to any failure to meet other provisions of these specifications:
- .1 Mortar shrinkage cracks between units.
- .2 Unfilled joints.
- .3 Spalling of units or joints.
- .4 Poor colour or texture blending of joints or units.
- .5 Dusting, efflorescence of joints or units.
- .6 Surface discolouration, discolouration, variance of colour or crumbling of mortar.
- .7 Failure of anchors of built-in items.
- .8 Sloppy fitting, or otherwise poor workmanship in levelling, bedding or jointing of units.
- .9 Failure to match adjacent work or failure to match control test area.

PART 2 PRODUCTS

2.01 MATERIALS

.1 Masonry materials are specified in related Sections.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.02 PREPARATION

.1 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

.2 Bracing approved by Departmental Representative.

3.03 INSTALLATION

.1 Do masonry work in accordance with CAN/CSA A371 except where specified otherwise.

.2 Jointing

.1 For joint finishing, see Section 04 03 07 – Historic – Masonry Repointing and Repair.

3.04 SITE TOLERANCES

.1 Tolerances in notes to Clause 6.2 of CAN/CSA A371 apply.

3.05 FIELD QUALITY CONTROL

.1 Inspection and testing will be carried out by Testing Laboratory designated by Departmental Representative.

.2 Departmental Representative will pay costs for testing.

3.06 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.07 PROTECTION

.1 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

END OF SECTION

PART 1 GENERAL

1.01 RELATED SECTIONS

.1 Section 04 05 10 - Common Work Results for Masonry.

1.02 REFERENCES

.1 American Society for Testing and Materials (ASTM)
- .1 ASTM C1242-05, Guide for Design, Selection, and Installation of Exterior Dimension Stone Anchors and Anchoring Systems.

.2 Canadian Standards Association (CSA International).
- .1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
- .2 CAN/CSA A179-04 (R2009), Mortar and Grout For Unit Masonry.
- .3 CAN/CSA A370-04 (R2009), Connectors for Masonry.
- .4 CAN/CSA A371-04, Masonry Construction for Buildings.
- .5 CSA S304.1-04, Masonry Design for Buildings. (Limit States Design).

1.03 SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for epoxy coatings and galvanized protective coatings and touch-up products.
- .3 Submit product data on stainless steel anchors.

.2 Shop Drawings :
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop drawings consist of anchorage details.
- .3 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.
- .4 Shop drawings must show details of the anchors, specify required hole size to be cored in the stone, and installation procedures. Indicate material specifications for the steel portion of the anchors.

.3 Manufacturer's Instructions:
- .1 Submit manufacturer's installation instructions.

1.04 FIELD MEASUREMENTS

.1 Make all field measurements necessary to ensure the proper fit of all members.

1.05 QUALITY ASSURANCE

.1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.06 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with local collection services.

.3 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.

PART 2 PRODUCTS

2.01 MATERIALS

.1 Connectors: to CAN/CSA-A370 and CSA-S304.1.Corrosion protection: to CSA-S304.1.

.2 Anchors for stone: Stainless steel to Grade 304.

.3 Fasteners: Stainless steel screws
- .1 Acceptable Material
  - .1 Tapcon Concrete screws.

2.02 FABRICATION

.1 Fabricate connectors in accordance with CAN/CSA-A370.

.2 Ship reinforcement and connectors, clearly identified in accordance with drawings.

2.03 SOURCE QUALITY CONTROL

.1 Provide Departmental Representative with certified copy of mill test report of masonry anchors and connectors, showing physical and chemical analysis, minimum 2 weeks prior to commencing reinforcement work.

.2 Inform Departmental Representative of proposed source of material to be supplied.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.02 GENERAL

.1 Supply and install masonry connectors and reinforcement in accordance with ASTM C1242, CAN/CSA-A370, CAN/CSA-A371, CSA-A23.1 and CSA-S304.1 unless indicated otherwise.

.2 Prior to placing mortar and Restoration Mortar, obtain Departmental Representative's approval of placement of reinforcement and connectors. Supply and install additional reinforcement to masonry as indicated.

3.03 ANCHORS

.1 Supply and install stainless steel anchors as indicated. Fasten with stainless steel screws, minimum embedment 25mm.

3.04 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 GENERAL

1.01 RELATED SECTIONS

.1 Section 01 35 30 – Health and Safety Requirements.

.2 Section 02 41 19 - Selective Structure Demolition.

1.02 REFERENCES

.1 American Society for Testing and Materials (ASTM)
- .1 ASTM C117-04, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.
- .4 ASTM D1557-07, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700 kN-m/m ^{3}).
- .5 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 Canadian Standards Association (CSA)
- .1 CSA A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction.

.4 Ontario Provincial Standard Specification (OPSS)

1.03 DEFINITIONS

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
- .1 Rock: any solid material in excess of 0.25 m ^{3} and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m^3 bucket. Frozen material not classified as rock.
- .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.3 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.6 Unsuitable materials:
- .1 Weak and compressible materials under excavated areas.
- .2 Frost susceptible materials under excavated areas.
- .3 Frost susceptible materials:
  - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.2.
  - .2 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

1.04 SUBMITTALS

.1 Samples:
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Inform Departmental Representative at least 4 weeks prior to commencing Work, of proposed source of fill materials and provide access for sampling.
- .3 Submit 70 kg samples of type of fill specified including representative samples of excavated material.
- .4 Ship samples prepaid to Departmental Representative, in tightly closed containers to prevent contamination.

1.05 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 00 10 - General Instructions.

.2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Ensure emptied containers are sealed and stored safely.

1.06 PROTECTION OF EXISTING FEATURES

.1 Protect existing features in accordance with Section 01 35 30 – Health and Safety Requirements and applicable local regulations.

.2 Existing buried utilities and structures:
- .1 Prior to commencing excavation Work, notify applicable Owner or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Owners or authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.2 Confirm locations of buried utilities by careful test excavations.
.3 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
.4 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before re-routing. Costs for such Work to be paid by Departmental Representative.
.5 Record location of maintained, re-routed and abandoned underground lines.
.6 Confirm locations of recent excavations adjacent to area of excavation.

.3 Existing buildings and surface features:
.1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, pavement, survey bench marks and monuments which may be affected by Work.
.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair to approval of Departmental Representative.

.4 Where required for excavation, cut roots or branches as approved by Departmental Representative.

1.07 PERMITS

.1 Obtain all permits required to undertake the work noted in this section and on the drawings.

PART 2 PRODUCTS

2.01 MATERIALS

.1 Type 1 fill: Granular ‘A’ and ‘B’ to OPSS Specification Form 1010, and as follows:
.1 Crushed, pit run or screened stone or gravel.
.2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.2.

.2 Type 3 fill: selected material from excavation, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

.3 Sodding
.1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.
.2 Water supplied by Departmental Representative at designated source.
.3 Fertilizer to Canada “Fertilizers Act” and “Fertilizers Regulations”. Complete, synthetic, slow release with 65% of nitrogen content in water-insoluble form.

PART 3 EXECUTION

3.01 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Verify that grades match existing grades.

3.02 STRIPPING OF TOPSOIL

.1 Commence topsoil stripping of areas as noted on drawings and as directed by Departmental Representative after area has been cleared of grasses and removed from site.

.2 Strip topsoil full depth. Do not mix topsoil with subsoil.

.3 Stockpile in locations as directed by Departmental Representative. Stockpile height not to exceed 2m.

.4 Dispose of unused topsoil off site.

3.03 STOCKPILING

.1 Stockpile fill materials in areas designated by Departmental Representative. Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

3.04 DEWATERING

.1 Keep excavations free of water while Work is in progress.

.2 Protect open excavations against flooding and damage due to surface run-off.

.3 Dispose of water in a manner not detrimental to public and private property, or any portion of Work completed or under construction.

3.05 EXCAVATION

.1 Remove obstructions encountered during excavation.

.2 Excavation must not interfere with bearing capacity of adjacent foundations.

.3 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.4 Keep excavated and stockpiled materials a safe distance away from edge of trench as directed by Departmental Representative.

.5 Restrict vehicle operations directly adjacent to open trenches.

.6 Dispose of surplus and unsuitable excavated material off site.

.7 Do not obstruct flow of surface drainage or natural watercourses.

.8 Do not damage existing weeping tile.

.9 Notify Departmental Representative when bottom of excavation is reached.

.10 Obtain Departmental Representative approval of completed excavation.

.11 Remove unsuitable material from trench bottom to extent and depth as directed by Departmental Representative.

.12 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.

3.06 FILL TYPES AND COMPACTION

.1 Use fill of types as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D1557.
- .1 Exterior side of perimeter walls: use Type 1 fill. Compact to 90% S.P.D.
- .2 Around weeping tile: use clear crushed stone as noted on drawings.

3.07 BACKFILLING

.1 Do not proceed with backfilling operations until Departmental Representative has inspected and approved work as noted on the drawings.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 150 or 250 mm compacted thickness, as noted on drawings, up to match existing grades. Compact each layer before placing succeeding layer.

.5 Backfilling around installations.
- .1 Place bedding and surround material as specified elsewhere.
- .2 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1.0 m.

.6 Install drainage system in backfill as noted on drawings.

3.08 GRADING

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to following depths below finish grades:
.1 250 mm for grassed areas, flowerbeds.

.3 Slope rough grade away from building 1:50 minimum.

.4 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

3.09 SOD PLACEMENT

.1 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.

.2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.3 Roll sod as directed by Departmental Representative. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

.4 Fertilize to Owner’s requirements up to a maximum of one application.

3.10 RESTORATION

.1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 00 10 - General Instructions, trim slopes, and correct defects as directed by Departmental Representative.

.2 Replace topsoil as indicated.

.3 Reinstate lawns to elevation which existed before excavation.

.4 Slope rough grade away from building as noted on drawings.

.5 Clean and reinstate areas affected by Work as directed by Departmental Representative.

.6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

END OF SECTION

PART 1 GENERAL

1.01 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).1 ASTM D198-05a, Standard Test Methods of Static tests of Lumber in Structural Sizes.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.5-M91(March 1999), Low Flash Petroleum Spirits Thinner (Reaffirmation of December 1991).
- .2 CAN/CGSB-1.74-2001, Alkyd Traffic Paint.

.3 Ontario Provincial Standard Specifications (OPSS)
- .3 OPSS 302-April 1999, Construction Specification for Primary Granular Base.
- .4 OPSS 310-March 1993, Construction Specification for Hot Mixed, Hot Laid Asphaltic Concrete Paving and Hot Mix Patching.
- .5 OPSS 314-December 1993, Construction Specification for Untreated Granular, Subbase, Base, Surface Shoulder and Stockpiling.
- .6 OPSS 1010-March 1993, Material Specification for Aggregates, Granular A, B, M and Select Subgrade Material.
- .7 OPSS 1103-October 1989, Material Specification for Emulsified Asphalt.
- .8 OPSS 1150-May 1994, Material Specification for Hot Mixed, Hot Laid Asphalt Concrete.

1.02 PROTECTION

.1 Protect existing items designated to remain. In the event of damage to such items, immediately replace or make repairs to approval of Departmental Representative and at no cost to the Departmental Representative.

.2 Prevent debris from blocking drains.

.3 Disconnect services, if required, in accordance with local authority having jurisdiction.

.4 Protect all traffic from debris.

1.03 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Divert unused aggregate materials from landfill to facility for reuse.

.4 Fold up metal banding, flatten and place in designated area for recycling.

.5 Do not dispose of unused paint and paint thinner material into sewer system, into streams, lakes, onto ground or in other location where it will pose health environmental hazard.

.6 Divert unused asphalt from landfill to facility capable of recycling materials.

PART 2 PRODUCTS

2.01 MATERIALS

.1 Aggregates to: OPSS 1010.
.1 Granular A.

.2 Prime coat: MTO Primer to OPSS 1103.

.3 Tack coat: SS-1 to OPSS 1103.

.4 Asphalt concrete: to OPSS 1150.

2.02 EQUIPMENT

.1 All equipment used for spreading and compacting of asphalt shall meet requirements of OPSS Form 310.

PART 3 EXECUTION

3.01 PREPARATION

.1 Remove existing asphalt layer, over the area shown on Drawings, and dispose off site. Saw cut around area to be removed, so as not to disturb remaining areas.

.2 Install new granular A to minimum depth of 300mm to provide required grade.

.3 Shape granular base to achieve specified slopes.

.4 Compact granular base to 97% SPD.

.5 Apply tack coat prior to paving.

.6 Prior to laying mix, clean surfaces of loose and foreign material.

3.02 FOUNDATIONS

.1 Foundations for ramp to comprise:
.1 300 mm compacted thickness of granular base A.

.2 Construction of granular foundations: OPSS 314.

.3 Compaction: compact each lift of granular material to 97% maximum density as determined by Standard Procter Density and as per ASTM D198. Maximum lift thickness: 150 mm.

3.03 PAVEMENT THICKNESS

.1 Pavements for ramp surface:
.1 Wear course: 75 mm HL3.

3.04 PAVEMENT CONSTRUCTION

.1 Application of prime coat: OPSS 302.

.2 Apply primer at approximately 1.8L/sq.m at least 24hrs prior to asphalt surfacing.

.3 Construction of asphalt concrete: OPSS 310.

.4 Minimum 8 degrees Celsius air temperature when spread.

.5 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.6 Compact each course with a roller when it can support roller weight without undue cracking or displacement. Roll asphalt contentiously to density not less than 98%.

.7 Finish rolling shall be accomplished with minimum number of passes required to produce a satisfactory surface.

.8 Roll until Roller marks are eliminated.

.9 Finish surface smooth, true to grade to tolerance of 5mm in 3m.

.10 Tamp all asphalt edges.

END OF SECTION