



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 858-2016**

**MACLEAN PUMPING STATION INSTALLATION OF BOLLARDS**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 MACLEAN PUMPING STATION INSTALLATION OF BOLLARDS

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, May 2, 2017.

B2.2 Bids determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.

B2.3 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

### **B3. SITE INVESTIGATION**

B3.1 Further to C3.1, the Contract Administrator or an authorized representative will be available at the Site, MacLean Pumping Station, 875 Lagimodiere Blvd, from 9:00 am to 10:00am on April 19, 2017 to provide Bidders access to the Site.

B3.2 The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.

B3.3 Although attendance at the Site Investigations is not mandatory, the City strongly suggests that Bidders attend.

### **B4. ENQUIRIES**

B4.1 All enquiries shall be directed to the Contract Administrator identified in D4.1.

B4.2 If the Bidder finds errors, discrepancies or omissions in the Bid Opportunity, or is unsure of the meaning or intent of any provision therein, the Bidder shall notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least five (5) Business Days prior to the Submission Deadline.

B4.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator to all Bidders by issuing an addendum.

B4.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator only to the Bidder who made the enquiry.

B4.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B4 unless that response or interpretation is provided by the Contract Administrator in writing.

### **B5. CONFIDENTIALITY**

B5.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

- (a) was known to the Bidder before receipt hereof; or
- (b) becomes publicly known other than through the Bidder; or
- (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B5.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Bid Opportunity to the media or any member of the public without the prior written authorization of the Contract Administrator.

## **B6. ADDENDA**

B6.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.

B6.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.

B6.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

B6.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B6.2.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 8 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

## **B7. SUBSTITUTES**

B7.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.

B7.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B7.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.

B7.4 The Bidder shall ensure that any and all requests for approval of a substitute:

- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
- (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
- (c) identify any anticipated cost or time savings that may be associated with the substitute;
- (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
- (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.

B7.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an "approved equal" or as an "approved alternative", or may refuse to grant approval of the substitute.

- B7.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.
- B7.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B16.
- B7.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

## **B8. BID COMPONENTS**

- B8.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
  - (b) Form B: Prices;
- B8.2 Further to B8.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B7.
- B8.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely.
- B8.4 The Bid Submission may be submitted by mail, courier or personal delivery, or by facsimile transmission.
- B8.5 If the Bid Submission is submitted by mail, courier or personal delivery, it shall be enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address, and shall be submitted to:
- The City of Winnipeg  
Corporate Finance Department  
Materials Management Division  
185 King Street, Main Floor  
Winnipeg, MB R3B 1J1
- B8.5.1 Samples or other components of the Bid Submission which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid Submission.
- B8.6 Bidders are advised not to include any information/literature except as requested in accordance with B8.1.
- B8.7 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B16.1(a).
- B8.8 If the Bid Submission is submitted by facsimile transmission, it shall be submitted to 204 949-1178.
- B8.8.1 The Bidder is advised that the City cannot take responsibility for the availability of the facsimile machine at any time.

B8.8.2 Bids submitted by internet electronic mail (e-mail) will not be accepted.

**B9. BID**

B9.1 The Bidder shall complete Form A: Bid, making all required entries.

B9.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
- (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
- (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
- (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B9.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B9.2.

B9.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B9.4 Paragraph 10 of Form A: Bid shall be signed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
- (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers;
- (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B9.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B9.4.2 All signatures shall be original.

B9.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

**B10. PRICES**

B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B10.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.

B10.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B10.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

## **B11. DISCLOSURE**

B11.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.

B11.2 The Persons are:

- (a) N/A

## **B12. QUALIFICATION**

B12.1 The Bidder shall:

- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba; and
- (b) be financially capable of carrying out the terms of the Contract; and
- (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.

B12.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/debar.stm>

B12.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) have successfully carried out work similar in nature, scope and value to the Work; and
- (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
- (c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba);
- (d) upon request of the Contract Administrator, provide the Security Clearances in accordance with PART F - Security Clearance.

B12.4 Further to B12.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

- (a) Written confirmation of a safety and health certification meeting SAFE Work Manitoba's SAFE Work Certified Standard (e.g., COR™ and SECOR™) or
  - (i) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
  - (ii) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program or
- (b) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information



Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>.

- B12.5 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.
- B12.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

### **B13. OPENING OF BIDS AND RELEASE OF INFORMATION**

- B13.1 Bids will not be opened publicly.
- B13.2 Following the submission deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B13.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B13.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).

### **B14. IRREVOCABLE BID**

- B14.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 9 of Form A: Bid.
- B14.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work for the time period specified in Paragraph 9 of Form A: Bid.

### **B15. WITHDRAWAL OF BIDS**

- B15.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B15.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.
- B15.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B15.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:
- (a) retain the Bid until after the Submission Deadline has elapsed;
  - (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid; and
  - (c) if the notice has been given by any one of the persons specified in B15.1.3(b), declare the Bid withdrawn.

B15.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B14.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law.

## **B16. EVALUATION OF BIDS**

B16.1 Award of the Contract shall be based on the following bid evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Bid Opportunity or acceptable deviation there from (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B12 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B7.

B16.2 Further to B16.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B16.3 Further to B16.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.

B16.4 Further to B16.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B16.4.1 Further to B16.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

## **B17. AWARD OF CONTRACT**

B17.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B17.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B17.2.1 Without limiting the generality of B17.2, the City will have no obligation to award a Contract where:

- (a) the prices exceed the available City funds for the Work;
- (b) the prices are materially in excess of the prices received for similar work in the past;
- (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
- (d) only one Bid is received; or
- (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B17.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B16.

B17.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

- B17.4 Notwithstanding C4, the City may issue a Purchase Order to the successful Bidder in lieu of the execution of a Contract.
- B17.5 The Contract, as defined in C1.1, in its entirety shall be deemed to be incorporated in and to form a part of the Purchase Order notwithstanding that it is not necessarily attached to or accompany said Purchase Order.

## PART C - GENERAL CONDITIONS

### C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at [http://www.winnipeg.ca/matmgt/gen\\_cond.stm](http://www.winnipeg.ca/matmgt/gen_cond.stm)
- C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Construction*.

## **PART D - SUPPLEMENTAL CONDITIONS**

### **GENERAL**

#### **D1. GENERAL CONDITIONS**

D1.1 In addition to the *General Conditions for Construction*, these Supplemental Conditions are applicable to the Work of the Contract.

#### **D2. SCOPE OF WORK**

D2.1 The Work to be done under the Contract shall consist of the installation of caissons, continuous footing and bollard protection for Option A shown on the Drawings in front of the MacLean Pumping Station.

D2.2 The major components of the Work are as follows:

- (a) Excavation and Backfill for installation of bollards;
- (b) Relocation and/or protection of existing underground wiring to lights and plugs;
- (c) Installation of cast-in-place caissons;
- (d) Installation of structural reinforced concrete components;
- (e) Installation of bollard assembly units.

#### **D3. DEFINITIONS**

D3.1 When used in this Bid Opportunity:

- (a) "**ASTM**" means American Society of Testing and Materials;
- (b) "**City**" means City of Winnipeg
- (c) "**CSA**" means Canadian Standards Association;
- (d) "**WWD**" means Water & Wastewater Department;

#### **D4. CONTRACT ADMINISTRATOR**

D4.1 The Contract Administrator is:

Heather Buhler, P.Eng  
Project Engineer

Telephone No. 204-986-6425

Cellular No 204-806-4919

Email Address HBuhler@winnipeg.ca

D4.2 At the pre-construction meeting, the Contract Administrator will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D4.3 Bids Submissions must be submitted to the address in B8.

#### **D5. CONTRACTOR'S SUPERVISOR**

D5.1 At the pre-construction meeting, the Contractor shall identify his/her designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

## **D6. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE**

- D6.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.
- D6.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.
- D6.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;
- (a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;
  - (b) the Contract, all deliverables produced or developed; and
  - (c) any statement of fact or opinion regarding any aspect of the Contract.
- D6.4 A Contractor who violates any provision of D6 may be determined to be in breach of Contract.

## **D7. NOTICES**

- D7.1 Except as provided for in C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.
- D7.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D7.3, D7.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator as identified in D4.1.
- D7.3 Notwithstanding C21., all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:  
The City of Winnipeg  
Chief Financial Officer  
Facsimile No.: 204 949-1174
- D7.4 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following facsimile number:  
The City of Winnipeg  
Legal Services Department  
Attn: Director of Legal Services  
Facsimile No.: 204 947-9155
- D7.1 Bids Submissions must not be submitted to the above facsimile numbers. Bids must be submitted in accordance with B8.**

## **SUBMISSIONS**

### **D8. AUTHORITY TO CARRY ON BUSINESS**

- D8.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

## **D9. SAFE WORK PLAN**

- D9.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D9.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgmt/Safety/default.stm>

## **D10. INSURANCE**

- D10.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
  - (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence;
  - (c) all risks installation floater, carrying adequate limits to cover all machinery, equipment, supplies and/or materials intended to enter into and form part of any installation.
- D10.2 Deductibles shall be borne by the Contractor.
- D10.3 The Contractor shall provide the Contract Administrator with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than seven (7) Calendar Days from notification of the award of Contract by Purchase Order.
- D10.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

## **D11. PERFORMANCE SECURITY**

- D11.1 If the Contract Price exceeds twenty-five thousand dollars (\$25,000.00), the Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
  - (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
  - (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.
- D11.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D11.2 The Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of Purchase Order and prior to the commencement of any Work on the Site.

#### **D12. SUBCONTRACTOR LIST**

D12.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of Contract.

#### **D13. DETAILED WORK SCHEDULE**

D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D13.2 The detailed work schedule shall consist of the following:

- (a) a Gantt chart for the Work; and
- (b) as acceptable to the Contract Administrator.

D13.3 Further to D13.2(a), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade or specification division shall be on the vertical axis.

#### **SCHEDULE OF WORK**

#### **D14. COMMENCEMENT**

D14.1 The Contractor shall not commence any Work until he/she is in receipt of a Purchase Order from the Award Authority authorizing the commencement of the Work.

D14.2 The Contractor shall not commence any Work on the Site until:

- (a) the Contract Administrator has confirmed receipt and approval of:
  - (i) evidence of authority to carry on business specified in D8;
  - (ii) evidence of the workers compensation coverage specified in C6.15;
  - (iii) the Safe Work Plan specified in D9;
  - (iv) evidence of the insurance specified in D10;
  - (v) the performance security specified in D11;
  - (vi) the Subcontractor list specified in D12; and
  - (vii) the detailed work schedule specified in D13.
- (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

D14.3 The City intends to award this Contract by June 27, 2017

D14.3.1 If the actual date of award is later than the intended date, the dates specified for Substantial Performance and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

#### **D15. SUBSTANTIAL PERFORMANCE**

D15.1 The Contractor shall achieve Substantial Performance by October 10, 2017.

D15.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for



purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.

D15.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

#### **D16. TOTAL PERFORMANCE**

D16.1 The Contractor shall achieve Total Performance by October 24, 2017.

D16.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.

D16.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

#### **D17. LIQUIDATED DAMAGES**

D17.1 If the Contractor fails to achieve Substantial Performance in accordance with the Contract by the day fixed herein for Substantial Performance, the Contractor shall pay the City eight-hundred and fifty dollars (\$850) per Working Day for each and every Working Day following the day fixed herein for Substantial Performance during which such failure continues.

D17.2 The amount specified for liquidated damages in D17.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Substantial Performance by the day fixed herein for same.

D17.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

#### **CONTROL OF WORK**

##### **D18. JOB MEETINGS**

D18.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.

D18.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

##### **D19. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)**

D19.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

**D20. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS**

D20.1 Further to B12.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B12.4.

**MEASUREMENT AND PAYMENT**

**D21. PAYMENT**

D21.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

**WARRANTY**

**D22. WARRANTY**

D22.1 Warranty is as stated in C13.

**FORM H1: PERFORMANCE BOND**  
(See D11)

KNOW ALL MEN BY THESE PRESENTS THAT

\_\_\_\_\_ ,  
(hereinafter called the "Principal"), and

\_\_\_\_\_ ,  
(hereinafter called the "Surety"), are held and firmly bound unto **THE CITY OF WINNIPEG** (hereinafter called the "Obligee"), in the sum of

\_\_\_\_\_ dollars (\$\_\_\_\_\_)

of lawful money of Canada to be paid to the Obligee, or its successors or assigns, for the payment of which sum the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has entered into a written contract with the Obligee for

BID OPPORTUNITY NO. 858-2016

MACLEAN PUMPING STATION INSTALLATION OF BOLLARDS

which is by reference made part hereof and is hereinafter referred to as the "Contract".

NOW THEREFORE the condition of the above obligation is such that if the Principal shall:

- (a) carry out and perform the Contract and every part thereof in the manner and within the times set forth in the Contract and in accordance with the terms and conditions specified in the Contract;
- (b) perform the Work in a good, proper, workmanlike manner;
- (c) make all the payments whether to the Obligee or to others as therein provided;
- (d) in every other respect comply with the conditions and perform the covenants contained in the Contract; and
- (e) indemnify and save harmless the Obligee against and from all loss, costs, damages, claims, and demands of every description as set forth in the Contract, and from all penalties, assessments, claims, actions for loss, damages or compensation whether arising under "The Workers Compensation Act", or any other Act or otherwise arising out of or in any way connected with the performance or non-performance of the Contract or any part thereof during the term of the Contract and the warranty period provided for therein;

THEN THIS OBLIGATION SHALL BE VOID, but otherwise shall remain in full force and effect. The Surety shall not, however, be liable for a greater sum than the sum specified above.

AND IT IS HEREBY DECLARED AND AGREED that the Surety shall be liable as Principal, and that nothing of any kind or matter whatsoever that will not discharge the Principal shall operate as a discharge or release of liability of the Surety, any law or usage relating to the liability of Sureties to the contrary notwithstanding.

IN WITNESS WHEREOF the Principal and Surety have signed and sealed this bond the

\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ .

**SIGNED AND SEALED**  
in the presence of:

\_\_\_\_\_  
(Witness as to Principal if no seal)

\_\_\_\_\_  
(Name of Principal)

Per: \_\_\_\_\_ (Seal)

Per: \_\_\_\_\_

\_\_\_\_\_  
(Name of Surety)

By: \_\_\_\_\_ (Seal)  
(Attorney-in-Fact)

**FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT  
(PERFORMANCE SECURITY)**  
(See D11)

\_\_\_\_\_  
(Date)

The City of Winnipeg  
Legal Services Department  
185 King Street, 3rd Floor  
Winnipeg MB R3B 1J1

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 858-2016  
MACLEAN PUMPING STATION INSTALLATION OF BOLLARDS

Pursuant to the request of and for the account of our customer,

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

WE HEREBY ESTABLISH in your favour our irrevocable Standby Letter of Credit for a sum not exceeding in the aggregate

\_\_\_\_\_ Canadian dollars.

This Standby Letter of Credit may be drawn on by you at any time and from time to time upon written demand for payment made upon us by you. It is understood that we are obligated under this Standby Letter of Credit for the payment of monies only and we hereby agree that we shall honour your demand for payment without inquiring whether you have a right as between yourself and our customer to make such demand and without recognizing any claim of our customer or objection by the customer to payment by us.

The amount of this Standby Letter of Credit may be reduced from time to time only by amounts drawn upon it by you or by formal notice in writing given to us by you if you desire such reduction or are willing that it be made.

Partial drawings are permitted.

We engage with you that all demands for payment made within the terms and currency of this Standby Letter of Credit will be duly honoured if presented to us at:

\_\_\_\_\_  
(Address)

and we confirm and hereby undertake to ensure that all demands for payment will be duly honoured by us.

All demands for payment shall specifically state that they are drawn under this Standby Letter of Credit.

Subject to the condition hereinafter set forth, this Standby Letter of Credit will expire on

\_\_\_\_\_  
(Date)

It is a condition of this Standby Letter of Credit that it shall be deemed to be automatically extended from year to year without amendment from the present or any future expiry date, unless at least 30 days prior to the present or any future expiry date, we notify you in writing that we elect not to consider this Standby Letter of Credit to be renewable for any additional period.

This Standby Letter of Credit may not be revoked or amended without your prior written approval.

This credit is subject to the Uniform Customs and Practice for Documentary Credit (2007 Revision), International Chamber of Commerce Publication Number 600.

\_\_\_\_\_  
(Name of bank or financial institution)

Per: \_\_\_\_\_  
(Authorized Signing Officer)

Per: \_\_\_\_\_  
(Authorized Signing Officer)



## PART E - SPECIFICATIONS

### GENERAL

#### E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

E1.1 These Specifications shall apply to the Work.

E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.

E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Spec/Default.stm>

E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.

E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.

E1.3 The following are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
D-13673	MacLean Pumping Station, Installation of Bollards Sheet 1 of 2 – General Arrangement and General Notes
D-13674	MacLean Pumping Station, Installation of Bollards Sheet 2 of 2 – Sections and Details

#### E2. SITEWORK, MOBILIZATION, AND DEMOBILIZATION

##### DESCRIPTION

E2.1 This Specification covers all operations relating to sitework, mobilization and demobilization of the Contractor to the Site, as specified herein.

E2.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of the Works as hereinafter specified.

E2.3 Scope of Work

E2.3.1 The Work under this Specification shall include but not be limited to:

- (a) Mobilizing and demobilizing on-site Work facilities;
- (b) Snow and ice removals;
- (c) Traffic Control and Traffic Management;
- (d) Surface Restoration and Restoration of existing facilities; and
- (e) Site Security.

##### REFERENCES

E2.4 Sitework, Mobilization and Demobilization are in accordance with the most recent Standard Construction Specifications:

- (a) CW 1120 – Existing Services, Utilities and Structures; and
- (b) CW 1130 – Site Requirements.

##### LIMITS OF WORK



E2.5 Contractor shall refer to the Drawings for the Limits of Work.

#### MATERIALS AND EQUIPMENT

E2.6 All materials Supplied under this Specification shall be of a type approved by the Contract Administrator, and shall be subject to inspection and testing by the Contract Administrator.

E2.7 The Contractor shall be responsible for the supply, safe storage and handling of all materials as set forth in this Specification. All materials shall be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

E2.8 All equipment shall be of a type acceptable to the Contract Administrator and shall be kept in good working order.

#### CONSTRUCTION METHODS

E2.9 Site Inspection

- (a) Inspect the Site with the Contract Administrator to verify existing conditions prior to mobilizing on site.
- (b) Inspect the Site with the Contract Administrator soon after demobilizing on site, confirming Site has been restored to its original condition prior to installation of Work.

E2.10 Layout of On-Site Work

- (a) The Contractor shall mobilize all on-site Work and other temporary facilities.
- (b) The City will coordinate a designated area for storage and equipment for the Contractor east of the building. To access this designated area, the Contractor will have access north of the building.
- (c) Upon completion of construction activities, the Contractor shall remove all on-site Work and all temporary facilities.

E2.11 Access to Power

- (a) Upon request, the Contractor shall have access to a 110 volt 15 amp power source available from the existing parking receptacle. All other power requirements shall be provided by the contractor with suitable portable generators.
- (b) Upon completion of the Work and for safety concerns, the Contractor shall be responsible for contacting the Contract Administrator and WWD Personnel to terminate power.

E2.12 Cellular Telephone Communication

- (a) The Contractor's site supervisor is required to carry at all times, a cellular telephone with voice mail.

E2.13 Site Fencing

- (a) During the Work, the Contractor shall install temporary snow fence around the Work area. The Contractor shall be responsible for maintaining the snow fence in proper working condition.

E2.14 Snow and Ice Removal

- (a) Snow clearing shall be done on a regular basis.
- (b) Snow cover shall be cleared from the construction Site prior to commencement of the Work. The methodology to clear the snow shall be subject to the approval of the Contract Administrator.

E2.15 Traffic Control

- (a) Further to clauses 3.6 and 3.7 of CW 1130:

- (i) In accordance with the Manual of Temporary Traffic Control in Work Areas on City Streets, the Contractor ("Agency" in the manual) shall make arrangements with the Traffic Services Branch of the City of Winnipeg to place all temporary regulatory signs. The Contractor shall bear all costs associated with the placement of temporary traffic control devices by the Traffic Services Branch of the City of Winnipeg in connection with the Works undertaken by the Contractor.

#### E2.16 Traffic Management

- (a) Further to clause 3.7 of CW 1130, the following shall apply:
  - (i) Pedestrian and ambulance/emergency vehicle access must be maintained at all times.
  - (ii) One lane of the front service road shall remain open to traffic at all times.
  - (iii) The Contractor shall not block access at any time to the north and south building access roads.

#### E2.17 Surface Restorations

- (a) Further to clause 3.3 of CW 1130, when Total Performance is not achieved in the year the Contract is commenced, the Contractor shall temporarily repair any Work commenced and not completed to the satisfaction of the Contract Administrator. The Contractor shall maintain the temporary repairs in a safe condition as determined by the Contract Administrator until permanent repairs are completed. The Contractor shall bear all costs associated with temporary repairs and their maintenance.

#### E2.18 Restoration of Existing Facilities

- (a) Upon completion of the Work and demobilization, the Contractor shall restore existing facilities to their original condition, to the approval of the Contract Administrator.

#### E2.19 Site Security

- (a) All personnel on site are required to obtain a Criminal Record Search Certificate and Public Safety Verification Check, as outlined in PART F - - Security Clearance. The Contractor shall submit copies of the Criminal Record Search Certificates to the Contract Administrator identified in D4.
- (b) The Contractor is required to take measures necessary to secure the work areas when the work areas are vacated. The Contractor shall ensure that all open excavations are properly secured when off site.

### MEASUREMENT AND PAYMENT

E2.20 Sitework, mobilization and demobilization will be paid for at the Contract Lump Sum Price for "Sitework, Mobilization and Demobilization" for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E2.21 Sitework, Mobilization and Demobilization will be paid for at a percentage of the Contract Lump Sum Prices, as specified herein. These percentages shall be as follows:

- (a) When the Contract Administrator is satisfied that Work has commenced. 30%
- (b) Upon completion of the Work at the discretion of the Contract Administrator. 40%
- (c) Upon completion of the project. 30%

### E3. EXCAVATION AND BACKFILL

#### DESCRIPTION

E3.1 The Work under this Specification shall include the following:

- (a) Excavation required in constructing the continuous concrete footings for Option A as shown on the Drawings.
- (b) Demolition and removals of existing sidewalks, curbs and pavement as shown on the Drawings.
- (c) The off-site disposal of surplus and unsuitable materials.
- (d) Dewatering and/or precipitation removal at the excavation as may be required for construction of the Work.
- (e) Granular backfill required as shown on the Drawings.

E3.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for the incidental to the satisfactory performance and completion of all Work as hereinafter specified.

#### REFERENCES

- E3.3 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:
- (a) CW 1130 – Subgrade, Sub-Base, and Base Course Construction.
  - (b) CW 3170 – Earthwork and Grading.

#### EQUIPMENT

E3.4 All equipment shall be of a type acceptable to the Contract Administrator and shall be kept in good working order.

#### MATERIALS

- E3.5 All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator. There will be no charge to the Owner for any materials taken by the Contract Administrator for testing purposes.
- E3.6 The Contractor shall be responsible for the supply, safe storage, and handling of all materials as set forth in this Specification. All material shall be handled in a careful and workmanship like manner, to the satisfaction of the Contract Administrator.
- E3.7 Excavations shall be unclassified excavation and shall include the excavation and satisfactory disposal of all materials, earth, gravel, rubbish, cement, rock, or all other material of whatever character which may be encountered.
- E3.8 All materials shall be accepted by the Contract Administrator at least fourteen (14) Days before any construction is undertaken. If, in the opinion of the Contract Administrator, such materials in whole or in part, do not conform to the Specification detailed herein, or are found to be defective in manufacture, or have become damaged in transit, storage, or handling operations, then such material shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.
- E3.9 Backfill materials shall be free of frozen lumps and shall be placed and compacted in an unfrozen state. Backfill shall not be placed on frozen subsoil.
- E3.10 All granular backfill, including levelling base fill, shall be clean and free from organic material, meeting the following gradation requirements:

<b>CANADIAN METRIC SIEVE SIZE</b>	<b>PERCENT PASSING BY WEIGHT</b>
50 000	100
20 000	75 - 100
5 000	45 - 85
2 500	35 - 55
315	15 - 35
160	5 - 20
80	0 - 7

## CONSTRUCTION METHODS

- E3.11 Excavation shall be completed to the elevations required to construct the Works or to such other elevations as may be directed by the Contract Administrator in the field. Excavation sequence shall be done in a “top down” direction, in order to maintain stability. The dimensions of the excavation shall be such as to give sufficient clearances for the construction of the forms and their subsequent removal.
- E3.12 All excess excavated material shall become the property of the Contractor and shall be disposed of off-site by the Contractor.
- E3.13 The Contract Administrator shall be notified at least one (1) working day in advance of any backfilling operations. No backfill shall be placed against any concrete until accepted by the Contract Administrator.
- E3.14 All backfill material shall be supplied, placed, and compacted in lifts of 150 mm (maximum) to a minimum of 95% of Standard Proctor Dry Density. Lifts shall be brought up on all sides at the same time.
- E3.15 Contractor shall be required to provide necessary water or equipment during compaction of backfill material to achieve the required densities.
- E3.16 The Standard Proctor Density for granular and clay backfill material shall be determined at the optimum moisture content in accordance with standard laboratory Proctor Compaction Test Procedure.
- E3.17 The field density of the compacted layers shall be verified by Field Density Tests in accordance with ASTM Standard, Test for Density of Soil in Place by the Sand-Cone Method, or equivalent as accepted by the Contract Administrator.
- E3.18 The frequency and number of tests to be made shall be as determined by the Contract Administrator.
- E3.19 All workmanship and materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through to final acceptance of the specified Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or acceptance that may have previously been given. The Contract Administrator reserves the right to reject any materials or Works which are not in accordance with the requirements of this Specification.
- E3.20 The Contract Administrator shall be afforded full access for the inspection and control testing of constituent materials both at the site of the Work and at any plant used for production of the materials to determine whether the material is being supplied and placed in accordance with this Specification.
- E3.21 Any backfill material that does not meet the gradation and/or compaction requirements of this Specification shall be removed and replaced by the Contractor at his own expense, to the satisfaction of the Contract Administrator.

## MEASUREMENT AND PAYMENT

- E3.22 Excavation and backfilling will be paid for at the Contract Lump Sum Price for "Excavation and Backfill", which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

### **E4. CAST-IN-PLACE CAISSONS**

#### DESCRIPTION

- E4.1 This Specification shall cover all operations relating to the supply, delivery, and placement of cast-in-place concrete caissons and associated Work, as specified herein for Option A and as shown on the Drawings.
- E4.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.
- E4.3 Scope of Work
- (a) The Work under this Specification shall involve supplying and placing all cast-in-place caissons for Option A – 28 bollards, as shown on the Drawings.

#### MATERIALS

- E4.4 General
- (a) The Contractor shall be responsible for the supply, safe storage, and handling of all materials necessary set forth in this Specification.
- E4.5 Handling and Storage of Materials
- (a) All materials shall be handled and stored in a careful and workmanlike manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with CSA Standard CAN3-A23.1.
- E4.6 Testing and Approval
- (a) All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by a Testing Laboratory designated by the Contract Administrator for testing purposes.
- (b) All materials shall conform to CSA Standard CAN/CSA-23.1.
- (c) All testing of materials shall conform to CSA Standard CAN/CSA-23.2.
- E4.7 Supplementary Cementing Materials
- (a) Use of pozzolans, fly ash, or silica fume will not be permitted for use in structural concrete supplied under this Specification.
- E4.8 Water
- (a) Water used for mixing concrete shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances. It shall be equal to potable water in physical and chemical properties.
- E4.9 Concrete Supply
- (a) Concrete shall be proportioned, mixed and delivered in accordance with the requirements of CSA A23.1, except that the transporting of ready mixed concrete in non-agitating equipment will not be permitted unless prior written approval is received from the Contract Administrator.

- (b) Unless otherwise directed by the Contract Administrator, the discharge of ready mixed concrete shall be completed within 120 minutes after the introduction of the mixing water to the cementing materials and aggregates.

**E4.10 Aggregate**

- (a) The Contractor shall furnish in writing to the Contract Administrator, the location of the sources where aggregate will be obtained, in order that same may be inspected and tentatively approved by the Contract Administrator. Changes in the source of aggregate supplied during the course of the Contract will not be permitted without notification in writing to and the expressed approval of the Contract Administrator.

**E4.10.1 Fine Aggregate**

- (a) Shall consist of sand having clean, hard, strong, durable, uncoated grains, free from injurious amounts of dust, soft or flaking particles, shale, alkali, organic matter, loam, or other deleterious substances.
- (b) Fine aggregate shall be well-graded throughout and shall conform to the following grading requirements:

CANADIAN METRIC SIEVE SIZE	PERCENT PASSING BY WEIGHT
10 000	100
5 000	95 - 100
2 500	80 - 100
630	50 - 90
315	25 - 65
160	2 - 10
80	0 - 3

- (c) The fineness modulus of fine aggregate shall not be less than 2.2 or no more than 3.1 unless otherwise approved by the Contract Administrator

**E4.10.2 Course Aggregate (20mm Nominal)**

- (a) Standard course aggregate shall be used for cast-in-place concrete foundation required in this Specification.
- (b) Standard course aggregate shall consist of natural gravel, crushed stone, or other approved materials of similar characteristics, having clean, hard, strong, durable, uncoated particles, free from injurious amounts of soft, friable, thin, elongated, or laminated pieces, alkali, organic, or other deleterious matter. Course aggregate shall be well graded throughout and shall conform to the following grading requirements;

CANADIAN METRIC SIEVE SIZE	PERCENT PASSING BY WEIGHT
28 000	100
20 000	90 - 100
10 000	25 - 60
5 000	0 - 10
2 500	0 - 5
80	0 - 1

**E4.10.3 Admixtures**

- (a) No admixtures other than air-entraining agent shall be used without the written authorization of the Contract Administrator, unless otherwise specified in these Specifications. It shall be the Contractor's responsibility to ensure that any admixture is compatible with all other constituent materials.

- E4.10.4      Miscellaneous Materials
- (a) Miscellaneous materials shall be of the type specified on the Drawings or approved by the Contract Administrator.
- E4.10.5      Concrete Mix Design
- (a) Proportioning of fine aggregate, coarse aggregate, cement, water, and air entraining agent shall be such as yield concrete having the required strength and workability as follows;
- (i) Minimum Compressive Strength at 28 days = 35 MPa
  - (ii) Maximum Water/Cement Ratio = 0.45
  - (iii) Minimum Cement Content = 340 kg/m<sup>3</sup>
  - (iv) Slump = 80 mm ± 30 mm
  - (v) Aggregate 20 mm nominal
  - (vi) Air Content – 5% to 8%
  - (vii) Cement = Type HS, high sulphate-resistance
- E4.11      Construction Methods
- E4.11.1      Location and Alignment of Caissons
- (a) Caisson construction shall not commence until the Contractor has obtained clearance from the appropriate Authorities.
- (b) Caissons shall be placed in the positions shown on the Drawings and as directed by the Contract Administrator in the field.
- (c) The deviation of the axis of any finished caisson shall not differ by more than 1 percent from the vertical.
- E4.11.2      Buried Utilities
- (a) The Contractor shall exercise extreme caution when constructing the caisson foundation in the vicinity of existing buried utilities. The Contractor shall be responsible for obtaining exact location of any buried utilities from the appropriate Utility Authorities prior to installing the caissons.
- (b) The proposed locations of the caissons may be changed by the Contract Administrator if they interfere with buried utilities.
- (c) The Contractor shall be responsible for all costs that may be incurred for repair/rectification of any damage caused to the existing buried utilities as a result of the Contractor's operations, as determined by the Contract Administrator.
- (d) If underground utilities have been exposed, the underground utilities shall be covered with clean sand to 300 mm above the utility prior to backfilling. No additional payment will be made for backfilling utilities.
- E4.11.3      Excavation
- (a) Excavations for the caissons shall be made with equipment designed to remove a core of the diameter shown on the Drawings.
- (b) Upon reaching the required elevation, the bottom of the excavation shall be cleaned as directed by the Contract Administrator in the field.
- (c) All excavated material from the caissons shall become property of the Contractor and promptly removed from Site to an approved disposal area as located by the Contractor.
- (d) Upon completion of the cleaning out of the bottom of the caisson to the satisfaction of the Contract Administrator, the reinforcement shall be set in place and the concrete poured immediately. Under no circumstances shall a hole be left to stand open after boring has been completed.
- (e) If required, the Contractor is responsible for supplying sleeving if caving is experienced.

- (f) The sleeving shall be designed by the Contractor and constructed to resist all forces that may tend to distort it.
- (g) The sleeving shall be withdrawn as the concrete is placed in the bore. The sleeving shall extend at least 1 m below the top of the freshly deposited concrete at all times.
- (h) The clearance between the face of the bore hole and the sleeving shall not exceed 75 mm.

#### E4.11.4 Inspection of Bores

- (a) Concrete shall not be placed in a bore until the bore has been inspected and approved by the Contract Administrator.
- (b) The Contractor shall have available suitable light for the inspection of each bore throughout its entire length.
- (c) All improperly set sleeving, bore, or bottom shall be corrected to the satisfaction of the Contract Administrator.

#### E4.11.5 Placing Reinforcing Steel

- (a) Reinforcing shall be placed in accordance with the details shown on the Drawings and in accordance with Section E6.
- (b) Reinforcing shall be rigidly fastened together.
- (c) Lowered into the bore intact before concrete is placed.
- (d) Spacers shall be utilized to properly locate the reinforcing steel cage in the bore.

#### E4.11.6 Placing of Concrete

- (a) Notify the Contract Administrator at least forty-eight (48) hours prior to concrete placement so that an adequate inspection may be made of sleeve, reinforcement, and related Works. Placement without required prior notification will not be allowed.
- (b) Concrete shall not have a free fall of more than 2 m unless permitted otherwise by the contract administrator and shall be placed so that the aggregates will not separate or segregate. The slump of the concrete shall not exceed 110 mm unless authorized by the Contract Administrator. The concrete shall be vibrated throughout the entire length of the caisson.
- (c) Concrete shall be placed to the elevations as shown on the Drawings. The steel HSS shall be adequately supported in a plumb position as shown on the drawings. The top surface of the pile shall be finished smooth and with a hand float. Prior to placing structural concrete on the caisson the surface shall be wire brushed to remove laitance and provide a roughened bond surface.
- (d) The shaft shall be free of water and debris prior to placing of concrete. Concrete shall not be placed in or through water unless tremie pour methods are followed. Proposed tremie pour methods must be submitted to the Contract Administrator for review and approval.
- (e) Newly laid concrete threatened with damage by rain, snow, fog, or mist shall be protected with a tarpaulin or other approved means as directed by the Contract Administrator.

#### E4.11.7 Curing Concrete

- (a) The top of the freshly finished concrete caissons shall be covered and kept moist by means of wet polyester blankets immediately following finishing operations and shall be maintained at above 10°C for at least seven (7) consecutive days thereafter.
- (b) After finishing is completed, the surface shall be promptly covered with a minimum of a single layer of clean, damp polyester blanket.
- (c) Concrete shall be protected from the harmful effects of sunshine, drying winds, surface dripping or running water, vibration, and mechanical shock. Concrete shall be



protected from freezing until at least twenty-four hours after the end of the curing period.

- (d) Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3°C in one (1) hour or 20°C in twenty-four (24) hours.

E4.11.8 Cold Weather Concreting

- (a) Protection of concrete shall be considered incidental to its placement.
- (b) The requirements of CSA Standard A23.1-04 shall be applied to all concreting operations during cold weather, i.e. if the mean daily temperature falls below 5°C during placing and curing.

E4.12 Quality Control

- (a) All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing at the discretion of the Contract Administrator, including all operations from the selection and production of materials, through to final acceptance of the Work.
- (b) The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works that are not in accordance with the requirements of this Specification.
- (c) The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.
- (d) The Contractor will be required to undertake Quality Control tests, of all concrete supplied. All test results are to be copied to the Contract Administrator immediately after the tests have been performed.
- (e) The frequency and number of concrete Quality Control tests shall be in accordance with the requirements of CSA Standard A23.1-04.

MEASUREMENT AND PAYMENT

- E4.13 Cast-in-place caissons will be paid for at the Contract Lump Sum Price for "Cast-in-Place Caissons, Option A", which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

**E5. STRUCTURAL CONCRETE**

DESCRIPTION

- E5.1 This Specification shall cover all operations relating to the preparation of Portland Cement structural concrete for, and all concreting operations related to, the construction of structural concrete Works as specified herein for Option A – 28 bollards and as shown on the Drawings.
- E5.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.
- E5.3 Scope of Work
  - E5.3.1 The Work under this Specification shall include:
    - (a) Supply and placing structural concrete for continuous footings;
    - (b) Supply and placing structural concrete inside bollards;
    - (c) Supply and placement of galvanized reinforcing steel as shown on the drawings and specified in Section E6,

## MATERIALS

### E5.4 General

- (a) The Contractor shall be responsible for the supply, safe storage and handling of all materials as set forth in this Specification.

### E5.5 Handling and Storage of Materials

- (a) All materials shall be handled and stored in a careful and workmanlike manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with CSA Standard CAN3-A23.1.

### E5.6 Testing and Approval

- (a) All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by a Testing Laboratory designated by the Contract Administrator for testing purposes.
- (b) All materials shall conform to CSA Standard CAN/CSA-23.1.
- (c) All testing of materials shall conform to CSA Standard CAN/CSA-23.2.

### E5.7 Bonding Agents

- (a) Identify product(s) and submit product information to the Contract Administrator for review prior to concrete placement.

### E5.8 Curing Compound

- (a) If permitted for use, curing compound shall be liquid membrane-forming and conform to the requirements of ASTM Standard C309 and the proposed standard ASTM P198. Rate of application shall be 1.5 times the rate required to meet the requirements of ASTM P198 for the texture of concrete to which the curing compound is being applied.
- (b) Curing Compounds shall be resin-based and white-pigmented.

### E5.9 Water

- (a) Water used for mixing concrete shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances. It shall be equal to potable water in physical and chemical properties.

### E5.10 Concrete Supply

- (a) Concrete shall be proportioned, mixed and delivered in accordance with the requirements of CSA A23.1, except that the transporting of ready mixed concrete in non-agitating equipment will not be permitted unless prior written approval is received from the Contract Administrator.
- (b) Unless otherwise directed by the Contract Administrator, the discharge of ready mixed concrete shall be completed within 120 minutes after the introduction of the mixing water to the cementing materials and aggregates.

### E5.11 Aggregate

- (a) The Contractor shall furnish in writing to the Contract Administrator, the location of the sources where aggregate will be obtained, in order that same may be inspected and tentatively approved by the Contract Administrator. Changes in the source of aggregate supplied during the course of the Contract will not be permitted without notification in writing to and the expressed approval of the Contract Administrator.

#### E5.11.1 Fine Aggregate

- (a) Shall consist of sand having clean, hard, strong, durable, uncoated grains, free from injurious amounts of dust, soft or flaking particles, shale, alkali, organic matter, loam, or other deleterious substances.

- (b) Fine aggregate shall be well-graded throughout and shall conform to the following grading requirements:

CANADIAN METRIC SIEVE SIZE	PERCENT PASSING BY WEIGHT
10 000	100
5 000	95 - 100
2 500	80 - 100
630	50 - 90
315	25 - 65
160	2 - 10
80	0 - 3

- (c) The fineness modulus of fine aggregate shall not be less than 2.2 or no more than 3.1 unless otherwise approved by the Contract Administrator

E5.11.2 Course Aggregate (20mm Nominal)

- (a) Standard course aggregate shall be used for cast-in-place concrete foundation required in this Specification.
- (b) Standard course aggregate shall consist of natural gravel, crushed stone, or other approved materials of similar characteristics, having clean, hard, strong, durable, uncoated particles, free from injurious amounts of soft, friable, thin, elongated, or laminated pieces, alkali, organic, or other deleterious matter. Course aggregate shall be well graded throughout and shall conform to the following grading requirements;

CANADIAN METRIC SIEVE SIZE	PERCENT PASSING BY WEIGHT
28 000	100
20 000	90 - 100
10 000	25 - 60
5 000	0 - 10
2 500	0 - 5
80	0 - 1

E5.11.3 Admixtures

- (a) No admixtures other than air-entraining agent shall be used without the written authorization of the Contract Administrator, unless otherwise specified in these Specifications. It shall be the Contractor's responsibility to ensure that any admixture is compatible with all other constituent materials.

E5.11.4 Miscellaneous Materials

- (a) Miscellaneous materials shall be of the type specified on the Drawings or approved by the Contract Administrator.

E5.11.5 Concrete Mix Design

- (a) Proportioning of fine aggregate, coarse aggregate, cement, water, and air entraining agent shall be such as yield concrete having the required strength and workability as follows;
- (i) Minimum Compressive Strength at 28 days = 35 MPa
  - (ii) Maximum Water/Cement Ratio = 0.45
  - (iii) Minimum Cement Content = 340 kg/m<sup>3</sup>
  - (iv) Slump = 80 mm ± 30 mm
  - (v) Aggregate 20 mm nominal
  - (vi) Air Content – 5% to 8%

(vii) Cement = Type HS, high sulphate-resistance

## E5.12 Construction Methods

### E5.12.1 Location and Alignment

- (a) Continuous footing and bollard shall be placed in the positions shown on the Drawings and as directed by the Contract Administrator in the field.

### E5.12.2 Buried Utilities

- (a) The Contractor shall exercise extreme caution when excavating continuous footings in the vicinity of existing buried utilities. The Contractor shall be responsible for obtaining exact location of any buried utilities from the appropriate Utility Authorities prior to installing the caissons.
- (b) The Contractor shall be responsible for all costs that may be incurred for repair/rectification of any damage caused to the existing buried utilities as a result of the Contractor's operations, as determined by the Contract Administrator.
- (c) If underground utilities have been exposed, the underground utilities shall be covered with clean sand to 300 mm above the utility prior to backfilling. No additional payment will be made for backfilling utilities.

### E5.12.3 Placing Reinforcing Steel

- (a) Reinforcing shall be placed in accordance with the details shown on the Drawings and in accordance with Section E6.
- (b) Reinforcing shall be rigidly fastened together.
- (c) Spacers shall be utilized to properly locate the reinforcing steel cage in the formwork.

### E5.12.4 Placing of Concrete

- (a) Notify the Contract Administrator at least forty-eight (48) hours prior to concrete placement so that an adequate inspection may be made of sleeve, reinforcement, and related Works. Placement without required prior notification will not be allowed.
- (b) Before depositing any concrete, all debris shall be removed from the space to be occupied by the concrete and any mortar splashed upon the reinforcement or forms shall be removed to the satisfaction of the Contract Administrator.
- (c) Placing of concrete shall be continuous. No concrete shall be placed against concrete that has sufficiently hardened to cause the formation of seams or "cold joints" within the section. If placing must be interrupted, construction joints shall be used as approved by the Contract Administrator.
- (d) The maximum drop of free concrete into the forms shall not be greater than 1.5 m. Use rubber tubes or pouring ports spaced not more than 1.5 m vertically and 2.5 m horizontally to meet this requirement.
- (e) Concrete shall be consolidated by mechanical vibrators during and immediately after deposition so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of the forms; eliminating all air or stone pockets that may cause honeycombing, pitting or planes of weakness.
- (f) Do not place concrete in rain or snow unless adequate protection is provided for formwork and concrete surfaces.

### E5.12.5 Finishing of Unformed Surfaces

- (a) Screed unformed concrete surfaces by the sawing movement of a straight edge along wood or metal strips or form edges that have been accurately set at required elevations.
- (b) Screed all concrete surfaces as a first step in other finishing operations. Complete screeding immediately after the concrete has been vibrated.

- (c) Hand float level all horizontal surfaces. Concrete surfaces after floating shall have a uniform, smooth, granular texture to the satisfaction of the Contract Administrator.

#### E5.12.6 Curing Concrete

- (a) The top of the freshly finished concrete shall be covered and kept moist by means of wet polyester blankets immediately following finishing operations and shall be maintained at above 10°C for at least seven (7) consecutive days thereafter.
- (b) After finishing is completed, the surface shall be promptly covered with a minimum of a single layer of clean, damp polyester blanket.
- (c) Concrete shall be protected from the harmful effects of sunshine, drying winds, surface dripping or running water, vibration, and mechanical shock. Concrete shall be protected from freezing until at least twenty-four hours after the end of the curing period.
- (d) Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3°C in one (1) hour or 20°C in twenty-four (24) hours.

#### E5.12.7 Form Removal

- (a) Forms shall remain in place for a minimum of seven (7) days unless otherwise accepted by the Contract Administrator. Notify the Contract Administrator at least twenty-four (24) hours prior to any form removal and obtain approval prior to removing forms.
- (b) Forms shall remain in place until the concrete has reached a minimum 25 MPa.

#### E5.12.8 Patching of Formed Surfaces

- (a) All formed concrete surfaces shall have bolts, ties, struts, and all other timber or metal materials not required for construction purposes cut back fifty (50) mm from the surface before patching.

#### E5.12.9 Cold Weather Concreting

- (a) Protection of concrete shall be considered incidental to its placement.
- (b) The requirements of CSA Standard A23.1-04 shall be applied to all concreting operations during cold weather, i.e. if the mean daily temperature falls below 5°C during placing and curing.

#### E5.12.10 Hot Weather Concrete

- (a) Protection of concrete shall be considered incidental to its placement.
- (b) The requirements of this section shall be applied during hot weather, i.e. air temperatures forecast to go higher than 27°C during placing.
- (c) Concrete at discharge shall be at as low a temperature as possible, preferably as low as 15°C, but not above 25°C. Concrete containing silica fume shall be between 10°C minimum and 18°C maximum at discharge. Aggregate stockpiles should be cooled by water sprays and sun shades.
- (d) The Contractor shall use cold water and/or ice in the mix to keep the temperature of the fresh concrete down, if required. Ice may be substituted for a portion of the mixing water; provided it has melted by the time mixing is completed.
- (e) Form and conveying equipment shall be kept as cool as possible before concreting by shading them from the sun and/or use of water sprays.
- (f) Sun shades and wind breaks shall be used as required during placing and finishing.
- (g) Work shall be planned so that concrete can be placed as quickly as possible to avoid "cold joints".
- (h) The Contract Administrator's acceptance is necessary before the Contractor may use admixtures such as retardants to delay setting, or water reducing agents to maintain workability and strength.

- (i) Hot weather curing shall follow immediately after finishing operations.

**E5.12.11 Hot-Weather Curing**

- (a) When the air temperature is at or above 25°C, curing shall be accomplished by fog misting and by using saturated absorptive fabric, in order to achieve cooling by evaporation.

**E5.12.12 Concrete Temperature**

- (a) The temperature of the concrete placed shall be as low as practicable and in no case greater than the following temperatures, as shown;

<b>Acceptable Concrete Temperatures</b>		
<b>Thickness of Section</b>	<b>Temperature Minimum</b>	<b>Temperature Maximum</b>
< 1.0 m	10	27
< 1.2 m	5	25

**E5.13 Quality Control**

- (a) All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing at the discretion of the Contract Administrator, including all operations from the selection and production of materials, through to final acceptance of the Work.
- (b) The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works that are not in accordance with the requirements of this Specification.
- (c) The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.
- (d) The Contractor will be required to undertake Quality Control tests, of all concrete supplied. All test results are to be copied to the Contract Administrator immediately after the tests have been performed.
- (e) The frequency and number of concrete Quality Control tests shall be in accordance with the requirements of CSA Standard A23.1-04.

**MEASUREMENT AND PAYMENT**

- E5.14 Structural concrete will be paid for at the Contract Lump Sum Price for “Structural Concrete, Option A”, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

**E6. SUPPLY AND PLACING REINFORCING STEEL**

**DESCRIPTION**

- E6.1 This Specification shall cover all operations relating to the supply, delivery, fabrication, and placement of hot-dipped galvanized steel reinforcing and associated bar accessories, as specified herein for Option A – 28 bollards and as shown on the Drawings.
- E6.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things

necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

**E6.3 Scope of Work**

- (a) The Work under this Specification shall involve supplying and placing all steel reinforcing, as shown on the Drawings for the following Works:

<b>SCOPE OF WORK</b>	
<b>Item</b>	<b>Type of Steel Reinforcing</b>
Caissons	Hot-dipped Galvanized Steel Reinforcement
Footings	Hot-dipped Galvanized Steel Reinforcement

**REFERENCES**

- E6.4 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) ASTM A955M – Standard Specification for Deformed and Plain Stainless-Steel Bars for Concrete Reinforcing;
- (b) ASTM A615M – Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement;
- (c) ASTM A143 – Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedures for Detecting Embrittlement;
- (d) ASTM A780/A780M – Standard Practice for Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings;
- (e) ASTM A767/A767M – Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement;
- (f) CAN/CSA A23.1/A23.2 – Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete;
- (g) CAN/CSA G30.18-M92 – Billet Steel Bars for Concrete Reinforcement;
- (h) ACI 315R – Manual of Engineering and Placing Drawings for Reinforced Concrete Structures. And
- (i) Reinforcing Steel Institute of Canada (RSIC), Manual of Standard Practice.

**SUBMITTALS**

**E6.5 General**

- (a) At least twenty-one (21) Days prior to the scheduled commencement of any fabrication, the qualifications of the Contractor and its Operators shall be submitted to the Contract Administrator for review and approval.
- (b) The Contractor shall submit to the Contract Administrator for review and approval, at least fourteen (14) Days prior to commencement of any schedule Work on the Site, a proposed schedule, including methods and sequence of operations.
- (c) Contractor shall submit all original mill certificates to the Contract Administrator prior to placement of reinforcing on site.
- (d) Contractor to submit Shop Drawings (including bar lists) in accordance with section E and the latest edition of the Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada (RSIC).

**MATERIALS**

## E6.6 General

- (a) The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification. All materials shall be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.
- (b) Bundles of reinforcing steel shall be identified by tags containing bar marks.
- (c) The reinforcing steel shall not be placed directly on the ground. Sufficient timber pallets or blocking shall be placed under the reinforcing steel to keep them free from dirt and mud.

## E6.7 Reinforcing Steel

- (a) Reinforcing steel shall be deemed to include all reinforcing bars, tie-bars, and dowels.
- (b) All reinforcing steel shall conform to the requirements of CSA Standard CAN/CSA G30.18-M92, Grade 400W, Billet-Steel Bars for Concrete Reinforcement.
- (c) If, in the opinion of the Contract Administrator, any reinforcing steel provided for the concrete Works exhibit flaws in manufacture or fabrication, such material shall be immediately removed from the site and replaced with acceptable reinforcing steel. No additional costs will be applied to this Contract for the replacement of deficient reinforcing steel.

All reinforcing steel shall be straight and free from paint, oil, millscale, and injurious defects. Rust, surface seams or surface irregularities will not be cause for rejection, provided that the minimum dimensions, cross-sectional area, and tensile properties of a hand wire-brushed specimen are not less than the requirements of CSA Standard CAN/CSA G30.18-M92 and ASTM A955M.

## REFERENCES

### E6.8 Galvanizing

#### E6.8.1 Shop Applied

- (a) The galvanizing shall be shop applied and strictly in accordance with CSA Standard G164 and ASTM A767M latest addition to a retention equal to a Class II level (610 g/m<sup>2</sup>), except as otherwise specified herein.
- (b) Submit an original and three (1) copies of the coating applicator's notarized Certificate of Compliance that the hot-dip galvanized coating meets or exceeds the specified requirements.
- (c) Preclean reinforcing steel using acceptable methods to produce an acceptable surface for quality hot-dip galvanizing. If sulphuric acid or hydrochloric acid is used as a pickling bath for precleaning, care shall be exercised to minimize the immersion time. If signs of hydrogen embrittlement are present after pickling due to excessive immersion time, all reinforcing in that shipment will be rejected and shall be replaced at no additional cost to this Contract.
- (d) Handle all articles to be galvanized in such a manner as to avoid any mechanical damage and to minimize distortion.
- (e) The surface finish shall be continuous, adherent, as smooth and evenly distributed as possible, and free from any defect detrimental to the stated end use of the coated article.
- (f) Coating adhesion shall withstand normal handling consistent with the nature and thickness of the coating and normal use of the article.
- (g) Sheared ends of bars shall be coated with a zinc-rich formulation before rusting occurs and before shipment to the job site.
- (h) Furthermore, all field welds, as well as cracking and other visible damage or deterioration of the hot-dip galvanizing as a result of handling or bending operations, or any other causes, shall be galvanize-coated with field applied galvanizing touch-up material as specified hereinafter.



#### E6.8.2 Field Applied

- (a) All field applied galvanized coatings shall be applied in accordance with ASTM A780M.
- (b) Further to ASTM A780M, paints used for field applied galvanizing shall contain zinc dust above 92% in the dried film.
- (c) At least seven (7) days prior to any field applied galvanizing, the Contract shall submit the galvanizing product and application details to the Contract Administrator for review.
- (d) Spray applied field galvanizing will not be permitted. Where restrictions occur that brush applied field galvanizing is not possible, spray applied field galvanizing may be permitted if accepted in writing by the Contract Administrator prior to application.
- (e) All field applied galvanized coatings shall be applied in accordance with the manufacturer's recommendations and as directed by the Contract Administrator.
- (f) The maximum area to be repaired in the field shall be 2,000 mm<sup>2</sup>. Any damaged article with a damaged area greater shall be rejected, removed, and replaced at the Contractor's expense.

#### E6.9 Bar Accessories

- E6.9.1 Bar accessories shall be of types suitable for each type of reinforcing and a type acceptable to the Contract Administrator. They shall be made from a non-rusting material, and they shall not stain, blemish, or spall the concrete surface for the life of the concrete.
- E6.9.2 Bar chairs, bolsters, and bar supports shall be cementitious material as acceptable to the Contract Administrator. Plastic, PVC or galvanized bar chairs may be permitted if accepted in writing by the Contract Administrator prior to installation.
- E6.9.3 The use of pebbles, pieces of broken stone or brick, plastic, metal pipe, and wooden blocks, will not be permitted.
- E6.9.4 Placing of bar supports shall be done to meet the required construction loads.
- E6.9.5 Tie wire shall be the following;
- (a) Black, soft-annealed 1.6 mm diameter wire for black steel reinforcing;
  - (b) Nylon-coated wire or plastic-coated wire for black steel reinforcing;
  - (c) Nylon coated wire, galvanized coated wire or plastic-coated wire for hot-dipped galvanized steel reinforcing; and
  - (d) Stainless steel, fully annealed 1.6 mm diameter wire, Type 316 or 316L for stainless steel reinforcing.
- E6.9.6 Approved products are as supplied by Con Sys Inc., Box 341, Pinawa, Manitoba, Canada R0E 1L0 (204) 753-2404, or equal as accepted by the Contract Administrator in accordance with D4.
- E6.9.7 Bar accessories are not included in the Drawings and shall include bar chairs, spacers, clips, wire ties, wire (18 gauge minimum), or other similar devices and are to be acceptable to the Contract Administrator. The supplying and installation of bar accessories shall be deemed to be incidental to the supplying and placing of reinforcing steel.
- #### E6.10 Mechanical Splices
- (a) Mechanical splices shall be stainless steel, meeting the requirements of ASTM A955M, Type 316L, Type 2005, or Type 2304.

### CONSTRUCTION METHODS

#### E6.11 Fabrication of Reinforcing Steel

##### E6.11.1 General

- (a) Reinforcing steel shall be fabricated in accordance with CSA Standard CAN/CSA G30.18-M92 to the lengths and shapes as shown on the Drawings.

## E6.12 Reinforcing Steel

### E6.12.1 Galvanized Reinforcing Steel

- (a) The reinforcing fabricator shall consult with the Contractor, Contract Administrator and hot-dip galvanizer regarding potential problems or potential handling problems prior or during the galvanizing process.
- (b) Remove all welding slag, splatter, anti splatter compounds, and burrs prior to delivery for galvanizing.
- (c) Avoid unsuitable marking paints. Consult with the galvanizer about removal of grease, oil, paint, and other deleterious material prior to fabrication.
- (d) Remove by blast cleaning or other methods surface contaminants and coatings which would not be removable by the normal chemical cleaning process in the galvanizing operation.
- (e) Hooks or bends should be smooth and not sharp. Bars are to be bent prior to galvanizing. Minimum bend diameters shall be provided in accordance with ASTM A767 latest edition.
- (f) The reinforcing shall be a minimum of 10°C prior to bending and galvanizing operations, regardless of ambient temperatures in the plant. Where ambient temperatures fall below 10°C, bending and galvanizing in a facility that is not enclosed and temperature controlled will not be permitted.
- (g) The Contractor is responsible to ensure that accelerated strain-embrittlement does not occur during the manufacturing, bending practices and galvanizing of the reinforcing steel. The Contractor shall submit to the Contract Administrator the following:
  - (i) Reinforcing Supplier standards of practice for working of reinforcing steel. This shall include bending practices as per ASTM A767-latest addition and temperature requirements during fabrication (bending) of reinforcing. This is to be submitted with the Certificate of Compliance from the Manufacturer.
  - (ii) Contractor is to carry out a Quality Control Testing Program following the requirements as per ASTM A143/A143M-latest addition. This will include but not limited to random bent bars to be tested after galvanizing, photos of items before and after testing, and a report submitted to the Contract Administrator for each trailer load received on site. Testing criteria shall be submitted for review and approval to the Contract Administrator at least ten (10) Business days prior to manufacturing of reinforcing.

### E6.13 Placing of Reinforcing Steel

- (a) Reinforcing steel shall be placed accurately in the positions shown on the Drawings and shall be retained in such positions by means of a sufficient number of bar accessories so that the bars shall not be moved out of alignment during or after the depositing of concrete. The Contract Administrator's decision in this matter shall be final.
- (b) Reinforcing steel shall be free of all foreign material in order to ensure a positive bond between the concrete and steel. The Contractor shall also remove any dry concrete which has been deposited on the steel from previous pouring operations before additional concrete may be placed. Intersecting bars shall be tied positively at each intersection.
- (c) Splices in reinforcing steel shall be made only where indicated on the Drawings. Prior acceptance by the Contract Administrator shall be obtained where other splices must be made. Welded splices will not be permitted.
- (d) Place reinforcing bars to provide a clear space between the reinforcing bars as shown on the Drawings to accurately place preformed holes where necessary.

- (e) Reinforcing steel shall not be straightened or rebent in a manner that will injure the metal or create excess damage to the galvanized coating. Bars with bends not shown on the Drawings shall not be used.
- (f) Heating of reinforcing steel will not be permitted without prior acceptance by the Contract Administrator.
- (g) A minimum of twenty-four (24) hours advance notice shall be given to the Contract Administrator prior to the pouring of any concrete to allow for inspection of the reinforcement.
- (h) Following placement of galvanized-coated bars, all areas of damaged coating shall be repaired using approved touch-up coating material specified in Clause E6.5(c).

## QUALITY CONTROL

### E6.14 Inspection

- (a) All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through to final acceptance of the specified Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or acceptance that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works which are not in accordance with the requirements of this Specification, regardless of any previous inspection or approval.

### E6.15 Access

- (a) The Contract Administrator shall be afforded full access for the inspection and control testing of reinforcing steel, both at the Site of Work and at any plant used for the fabrication of the reinforcing steel, to determine whether the reinforcing steel is being supplied in accordance with this Specification.

### E6.16 Quality Testing

- (a) Quality control testing may be used to determine the acceptability of the reinforcing steel supplied by the Contractor.
- (b) The Contractor shall provide, without charge, the samples of reinforcing steel required for quality control tests and provide such assistance and use of tools and construction equipment as is required.

## MEASUREMENT AND PAYMENT

- E6.17 Reinforcing steel bars shall be considered incidental to the Contract Lump Sum Prices for "Cast-in-Place Caissons, Option A" and "Structural Concrete, Option A", which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

## **E7. BOLLARDS**

### DESCRIPTION

- E7.1 This specification shall cover all operations relating to the fabrication, supply, delivery and installation of all components of the bollard assembly for Option A – 28 bollards as shown on the drawings.
- E7.2 The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for and incidental to the satisfactory performance and completion of all work herein specified.

- E7.3 Scope of Work under this specification shall include the following:
- (a) Supply and installation of structural steel fabrication HSS sections;
  - (b) Supply and installation of galvanized metal culvert;
  - (c) Supply and installation of galvanized bollard lid and fittings;
  - (d) Supply and Installation of closed cell polyurethane spray foam; and
  - (e) Supply and installation of infill concrete.

## REFERENCES

- E7.4 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:
- (a) CW 3610 – Installation of Culverts
  - (b) E5 - Structural Concrete

## MATERIALS

- E7.5 General
- (a) The Contractor shall be responsible for the supply, safe storage, and handling of all materials necessary set forth in this specification and to the satisfaction of the Contract Administrator.
- E7.6 Structural Steel
- (a) HSS sections shall conform G40.21 Grade 350W
  - (b) Steel fabrications shall conform to G40.21 Grade 300W
  - (c) Hot dipped galvanizing shall conform to ASTM A123 and CAN/CSA G164
- E7.7 Galvanized Corrugated Steel Pipe
- (a) Commercially available loc-seam spiral in accordance with CSA standard G401-07
  - (b) Hot dipped galvanizing shall conform to ASTM A123 and CAN/CSA G164
  - (c) Refer to the Contract Drawings for diameter and wall thickness.
- E7.8 Polyurethane Foam
- (a) Spray applied closed cell polyurethane foam to produce a set density of 2 lbs per cubic foot.
- E7.9 Bond Breaker
- (a) Trowel Grade EPIC EP 102 petroleum grease as manufactured by Mobil

## CONSTRUCTION METHODS

- E7.10 Procedure
- (a) The HSS section shall be fully supported in a plumb position and installed centered in the top 600 mm of the cast-in-place caisson as shown on the drawings. The exterior surface of the bottom 600 mm of the HSS section shall be coated with bond breaker grease prior to immersion in the caisson.
  - (b) Prior to the placing of concrete in the 600 x 1800 footing the next 600 mm section of HSS section shall be coated with bond breaker grease.
  - (c) After the footing has set for a minimum of 4 days the galvanized CSP may be installed and temporarily held in place centered around the HSS section as shown on the drawings. Prior to installation the top and bottom edges of the CSP shall be touched up with two coats of galvanized spray paint if not protected by shop galvanizing. Infill concrete shall be

placed in the bottom 150 mm of the CSP and the HSS section shall also be filled with concrete to the top.

- (d) After the concrete has cured for a minimum 7 days the culvert shall be filled with polyurethane foam in accordance with the manufacturer's instructions to achieve a set density of 2 lbs per cubic foot. This may involve successive applications of foam at each bollard location.
- (e) Once filled with foam the galvanized bollard lid shall be bolted in place as shown on the drawings.

#### MEASUREMENT AND PAYMENT

- E7.11 Bollards will be paid for at the Contract Lump Sum Price for "Bollards, Option A", which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

## PART F - SECURITY CLEARANCE

### F1. SECURITY CLEARANCE

- F1.1 Each individual proposed to perform Work under this Contract shall be required to obtain a Criminal Record Search Certificate and a Public Safety Verification Check as detailed below:
- (a) the Criminal Record Search Certificate may be obtained from one of the following:
    - (i) a police service having jurisdiction at his/her place of residence.
    - (i) the original Criminal Record Search Certificate (Form P-253) will be provided by the Winnipeg Police Service to the individual applicant. The original has a validation sticker from the Winnipeg Police Service in the top right hand corner.
    - (ii) The applicant shall provide the original Criminal Record Search Certificate (Form P-253) to the Project Manager, or
    - (ii) using BackCheck, bidders will need to setup a BackCheck account prior to requesting individual background checks. This process should be done 72 hours prior to requesting the first check. The account can be setup using the following link. <https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity>. The Criminal Record Search Certificate must be received by the City directly through BackCheck;
      - (i) bidders must set up an account with BackCheck under their company name and grant BackCheck permission to share the Criminal Record Search Certificate with the City of Winnipeg;
      - (ii) bidders will then be contacted by BackCheck with instructions on how to complete the Criminal Record Search Certificate; and
      - (iii) if additional assistance is required to obtain the Criminal Record Search Certificate, the Bidder may contact the following BackCheck representative:  
Linda Ferens;  
email: [linda.ferens@sterlingts.com](mailto:linda.ferens@sterlingts.com)  
phone: (204) 999-0912; or
    - (iii) filling out the Core of Commissionaires (Manitoba Division) form which can be obtained by visiting: <https://www.commissionaires.ca/en/manitoba/home>.
  - (b) the Public Safety Verification Checks can be obtained from BackCheck, bidders will need to setup a BackCheck account prior to requesting individual background checks. This process should be done 72hrs prior to requesting the first check. The account can be setup using the following link. <https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity>. The results of the Public Safety Verification Check must be received by the City directly through BackCheck.
    - (i) bidders must set up an account with BackCheck under their company name and grant BackCheck permission to share the Criminal Record Search Certificate with the City of Winnipeg;
    - (ii) bidders will then be contacted by BackCheck with instructions on how to complete the Public Safety Verification Check; and
    - (iii) if additional assistance is required to obtain the Public Safety Verification Check, the Bidder may contact the following BackCheck representative:  
Linda Ferens;  
email: [linda.ferens@sterlingts.com](mailto:linda.ferens@sterlingts.com);  
phone: (204) 999-0912.
- F1.2 Prior to the award of Contract, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Consultant shall supply the Project Manager with a Criminal Record Search Certificate and a Public Safety Verification Check obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform the Work.

- F1.3 Any individual for whom a Criminal Record Search Certificate or a Public Safety Verification Check is not provided, or for whom a Criminal Record Search Certificate or a Public Safety Verification Check indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work.
- F1.4 Any Criminal Record Search Certificate and Public Safety Verification Check obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.
- F1.5 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated Criminal Records Search Certificate or Public Safety Verification Check. Any individual who fails to provide a satisfactory Criminal Record Search Certificate or Public Safety Verification Check as a result of a repeated criminal records search will not be permitted to continue to perform any Work.