



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 377-2017**

**MARYLAND TWIN BRIDGES 2017 MAINTENANCE WORKS**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 MARYLAND TWIN BRIDGES 2017 MAINTENANCE WORKS

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, June 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 Bidder may make an appointment to gain access to the locked fenced areas of the Site by contacting the Contract Administrator. Otherwise, the Bidder may view the Site without making an appointment.

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.

### **B4. ENQUIRIES**

B4.1 All enquiries shall be directed to the Contract Administrator identified in D3.1.

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

B11.3 Additional Material:

(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);

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 The Work of this Contract is contingent upon Council approval of sufficient funding in the 2017 Capital Budget. If the Capital Budget approved by Council does not include sufficient funding for the Work, the City will have no obligation to award a Contract.

B17.4 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.

- B17.4.1 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.
- B17.5 Notwithstanding C4, the City may issue a Purchase Order to the successful Bidder in lieu of the execution of a Contract.
- B17.6 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 Concrete Repairs to Maryland Twin Bridges.

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

- (a) Mobilization and Demobilization
- (b) Traffic Control
- (c) Concrete Removal
- (d) Surface Preparation of Concrete Surfaces
- (e) Concrete Repair Type 1 to Type 9 inclusive
- (f) Metallizing of Concrete Surfaces

#### **D3. CONTRACT ADMINISTRATOR**

D3.1 The Contract Administrator is:

Bill Ebenspanger, P.Eng.  
Sr. Structural Engineer

Telephone No. 204 977 8370

Email Address [bebenspanger@morrisonhershfield.com](mailto:bebenspanger@morrisonhershfield.com)

D3.2 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.

D3.3 Bids Submissions must be submitted to the address in B8.

#### **D4. CONTRACTOR'S SUPERVISOR**

D4.1 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.

#### **D5. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE**

D5.1 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.

D5.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.

D5.3 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.

D5.4 A Contractor who violates any provision of D5 may be determined to be in breach of Contract.

## **D6. NOTICES**

D6.1 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.

D6.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D6.3, D6.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the facsimile number identified in D3.1.

D6.3 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

D6.4 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

**D6.5 Bid Submissions must not be submitted to the above facsimile numbers. Bids must be submitted in accordance with B8.**

## **SUBMISSIONS**

### **D7. AUTHORITY TO CARRY ON BUSINESS**

D7.1 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.

### **D8. SAFE WORK PLAN**

D8.1 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.

D8.2 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/matmgt/Safety/default.stm>

## **D9. INSURANCE**

- D9.1 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.
- D9.2 Deductibles shall be borne by the Contractor.
- D9.3 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.
- D9.4 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.
- D9.5 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.

## **D10. PERFORMANCE SECURITY**

- D10.1 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.
- D10.1.1 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.
- D10.2 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.

## **D11. SUBCONTRACTOR LIST**

D11.1 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.

## **D12. DETAILED WORK SCHEDULE**

D12.1 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.

D12.2 The detailed work schedule shall consist of the following:

- (a) a critical path method (C.P.M.) schedule for the Work;
- (b) a Gantt chart for the Work based on the C.P.M. schedule;
- (c) a daily manpower schedule for the Work;

all acceptable to the Contract Administrator.

D12.3 Further to D12.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:

D12.4 Further to D12.2(b), 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 shall be on the vertical axis.

D12.5 Further to D12.2(c), the daily manpower schedule shall list the daily number of individuals on the Site for each trade.

## **SCHEDULE OF WORK**

### **D13. COMMENCEMENT**

D13.1 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.

D13.2 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 D7;
  - (ii) evidence of the workers compensation coverage specified in C6.15;
  - (iii) the Safe Work Plan specified in D8;
  - (iv) evidence of the insurance specified in D9;
  - (v) the performance security specified in D10;
  - (vi) the Subcontractor list specified in D11; and
  - (vii) the detailed work schedule specified in D12.
- (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.

D13.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the Purchase Order.

D13.4 The City intends to award this Contract by June 23, 2017.



D13.4.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

**D14. CRITICAL STAGES**

D14.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

(a) N/A

**D15. SUBSTANTIAL PERFORMANCE**

D15.1 The Contractor shall achieve Substantial Performance by September 15, 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 September 29, 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 or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Calendar Day for each and every Calendar Day following the days fixed herein for same during which such failure continues:

(a) Substantial Performance – one thousand dollars (\$1,000.00);

(b) Total Performance – five hundred dollars (\$500.00).

D17.2 The amounts specified for liquidated damages in D17.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Substantial Performance or Total Performance by the days fixed herein for same.

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

## **D18. SCHEDULED MAINTENANCE**

D18.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

- (a) N/A

## **CONTROL OF WORK**

### **D19. JOB MEETINGS**

D19.1 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.

D19.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

### **D20. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)**

D20.1 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).

### **D21. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS**

D21.1 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**

### **D22. INVOICES**

D22.1 Further to C12, the Contractor shall submit an invoice for each portion of Work performed.

The City of Winnipeg  
Corporate Finance - Accounts Payable  
4th Floor, Administration Building, 510 Main Street  
Winnipeg MB R3B 1B9

Facsimile No.: 204-949-0864  
Email: [CityWpgAP@winnipeg.ca](mailto:CityWpgAP@winnipeg.ca)

D22.2 Invoices must clearly indicate, as a minimum:

- (a) the City's purchase order number;
- (b) date of delivery;
- (c) delivery address;
- (d) type and quantity of work performed;
- (e) the amount payable with GST and MRST shown as separate amounts; and
- (f) the Contractor's GST registration number.

D22.3 The City will bear no responsibility for delays in approval of invoices which are improperly submitted.

**D22.4 Bid Submissions must not be submitted to the above facsimile number. Bids must be submitted in accordance with B8.**

**D23. PAYMENT**

D23.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

**WARRANTY**

**D24. WARRANTY**

D24.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire two (2) years thereafter unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

D24.2 Notwithstanding C13.2 or D24.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if:

- (a) a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.

D24.2.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

**FORM H1: PERFORMANCE BOND**  
(See D10)

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. 377-2017

MARYLAND TWIN BRIDGES 2017 MAINTENANCE WORKS

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 D10)**

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

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 377-2017  
MARYLAND TWIN BRIDGES 2017 MAINTENANCE WORKS

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>
B108-17-01	Cover Sheet, Location Plan & Drawing Index
B108-17-02	Scope of Work & Specifications
B108-17-03	Location Plan & General Arrangement
B108-17-04	Maintenance Works Details I
B108-17-05	Maintenance Works Details II
B108-17-06	Maintenance Works Details III
B108-17-07	Maintenance Works Details IV

#### E2. MOBILIZATION AND DEMOBILIZATION

- E2.1 Description
- (a) This Specification shall cover all operations relating to the mobilization and demobilization of the Contractor to the Bridge Site, as specified herein.
- (b) 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 Works as hereinafter specified.
- E2.2 Scope of Work
- (a) The Work under this Specification shall include but not be limited to:
- (i) Mobilizing and demobilizing on-site Work facilities;
  - (ii) Supplying, setting up, laying out, and removing site office facilities as detailed in E3 "Site Office Facilities";
  - (iii) Supplying and installing secure fencing around the laydown/staging area;
  - (iv) Maintaining and removing any access roadways; and
  - (v) Restoring all existing facilities.
- E2.3 Materials
- (a) 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.

- (b) 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.

#### E2.4 Equipment

- (a) All equipment shall be of a type acceptable to the Contract Administrator and shall be kept in good working order.

#### E2.5 Construction Methods

#### E2.6 Layout of On-Site Work Facilities

- (a) The Contractor shall mobilize all on-site Work and other temporary facilities.
- (b) Possible locations for the Contractor's staging areas include the City of Winnipeg Park areas on the north and south sides of the Bridge. The Contractor shall coordinate with relevant parties to make arrangements for use of these areas.
- (c) Upon completion of construction activities, the Contractor shall remove all on-site Work and other temporary facilities.

#### E2.7 Cellular Telephone Communication

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

#### E2.8 Secure Site Fencing

- (a) A minimum 1.8 m high chain-link or wire grid secure fence around the site lay-down, lavatory facilities, and Work site areas, other than at the abutments, shall be installed prior to commencement of site activities. The Contractor may use existing fencing at the abutments as secure site fencing.
- (b) The fencing shall remain secure and in place for the full duration of the Work.
- (c) Access points to the fencing shall be secured by padlocks supplied by the Contractor or other appropriate means outside of working hours, including the existing fencing gates at the abutments.
- (d) The fencing shall be removed upon demobilization of on-site Work facilities.

#### E2.9 Traffic Gates

- (a) The Contractor shall supply, install, maintain, and remove steel gates to keep non-Contract traffic and pedestrians out of the Work site, where necessary.
- (b) Traffic gates shall nominally match the height of the secure site fencing and shall be continuous with the secure site fencing.
- (c) The gates shall be removed upon completion of construction activities.

#### E2.10 Access Roadway

- (a) The Contractor shall maintain any access roadway they install.
- (b) The access road shall be maintained on a regular basis to provide continual unrestricted site access, to the satisfaction of the Contract Administrator.
- (c) City of Winnipeg streets and alleys adjacent to all access roads and staging areas must be kept clean at all times.
- (d) Upon completion of the Work, the area shall be restored to its original condition.

#### E2.11 Restoration of Existing Facilities

- (a) Upon completion of the Work and demobilization, the Contractor shall restore existing facilities.

## E2.12 Quality Control

### E2.12.1 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.
- (b) 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.

### E2.12.2 Access

- (a) The Contractor shall allow the Contract Administrator free access to all parts of the Work at all times. The Contractor shall supply samples to the Contract Administrator or his inspector for testing purposes as required. There will be no charge to the City for samples taken.

## E2.13 Measurement and Payment

### E2.13.1 Mobilization and Demobilization

- (a) Mobilization and demobilization shall not be measured. This item of work shall be paid for at the Lump Sum Price for "Mobilization and Demobilization", which price shall be paid in full for supply all materials and performing all operations herein described and all other items incidental to the Work. Payment will be based on the following breakdown:
  - (i) Commencement of Construction 50%
  - (ii) Upon Completion of the Work 50%

## **E3. SITE OFFICE FACILITIES**

### E3.1 Description

- (a) This Specification shall cover all operations relating to the supply of site office facilities, as specified herein.
- (b) 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 Works as hereinafter specified.

### E3.2 Materials

- (a) 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.
- (b) 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.

### E3.3 Equipment

- (a) All equipment shall be of a type acceptable to the Contract Administrator and shall be kept in good working order.

### E3.4 Construction Methods

#### E3.4.1 Site Office Facilities

- (i) The Contractor shall supply the Contract Administrator's site office facilities meeting the following requirements:
- (ii) A site office shall be provided for the exclusive use of the Contract Administrator.

- (iii) The office shall be conveniently located within the site lay-down area near the Work site.
- (iv) The office shall be a newer building with a minimum floor area of 20 square metres, having a ceiling height of 2.4 m and adequate windows (complete with security bars) to provide for cross ventilation, with door entrance(s) with suitable lock(s).
- (v) The office shall be suitable for all weather use. It shall be equipped with suitable heating and air conditioning systems, so that the interior room temperature can be maintained between 20 to 22°C at any outside ambient temperature.
- (vi) The office shall be adequately lighted with fluorescent fixtures and have a minimum of 3 wall outlets.
- (vii) The office shall be furnished with one office desk with minimum plan dimensions 3' x 6' and two chairs, , one meeting table, two bookcases, and a minimum of eight (8) chairs.
- (viii) The office shall be equipped with reliable internet access, either provided by ethernet cable (hard line) or wireless internet service. Any wireless internet access shall be secured by an access password and by conventional WPA2 256-bit encryption to prevent unauthorized access. If wireless internet access is not provided, then a minimum of two ethernet connections shall be provided.
- (ix) The office shall be equipped with an individual size fridge having minimum nominal volume of 1.7 cubic feet, and a microwave.
- (x) The site office building shall be cleaned on a weekly basis. The Contract Administrator may request additional cleaning when he deems it necessary.
- (xi) All site office facilities and furnishings shall be approved by the Contract Administrator.
- (xii) The Contractor shall be responsible for all installation and removal costs, all operating costs, and the general maintenance of the site office facilities.
- (xiii) The site office facilities shall be provided from the date of the commencement of the Work to the date of Total Performance unless otherwise approved in writing by the Contract Administrator.

#### E3.4.2 Site Lavatory Facilities

- (xiv) A minimum of one portable flush or chemical-type toilet, lavatory, and mirror shall be provided at the work site. The portable toilets shall be accessible to the Contract Administrator at all times.
- (xv) The portable toilets shall be cleaned on a weekly basis. The Contract Administrator may request additional cleaning when he deems it necessary;

#### E3.5 Measurement and Payment

##### E3.5.1 Site Office Facilities

- (a) The supply of site office facilities, including site lavatory facilities, shall not be measured. This item of Work shall be included in the Lump Sum Price for "Mobilization and Demobilization", which price shall be paid in full for supply all materials and performing all operations herein described and all other items incidental to the Work.

### E4. TRAFFIC CONTROL

#### E4.1 Description

- E4.1.1 The Work covered under this item shall cover traffic control requirements as shown on the Drawings related to the concrete repairs and activated arc spray zinc metallizing for repair Type 9.
- E4.1.2 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.

#### E4.2 Notification

- (a) The Contractor shall submit a *Designated Construction Zone and/or Speed Limit Reduction Request* for approval by the Traffic Management Branch ((204) 986-5640 or email [PWDLaneClosures@winnipeg.ca](mailto:PWDLaneClosures@winnipeg.ca)) at least fourteen (14) Calendar Days prior to beginning repair Type 9.
- (b) The Contractor shall submit a *Regional Street Lane Closure Request* form at least fourteen (14) Calendar Days prior to beginning repair Type 9.
- (c) In accordance with the Manual, the Contractor shall make arrangements with the Traffic Services Branch to erect and maintain all temporary regulatory signs and other applicable traffic control devices (including, but not limited to, warning signs, barrels, tall cones, and chevrons) at least fourteen (14) Calendar Days prior to beginning repair Type 9.
- (d) The Contractor shall call the Traffic Services Branch at (204) 986-5178 at least forty-eight (48) hours prior to reopening the closed traffic lane.

#### E4.3 General

E4.3.1 Further to Clauses 3.6 and 3.7 of CW 1130, in accordance with the latest edition of the Manual of Temporary Traffic Control on City Streets (the Manual), the following shall be applicable to the Work:

- (a) The Contractor ("Construction Agency" in the Manual) shall:
  - (i) Ensure intersecting street and private approach access is maintained at all times. Should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of twenty-four (24) hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.
  - (ii) Place, maintain and remove the appropriate temporary traffic control devices as specified by the Manual, the Traffic Management Branch, and/or the Permit issued by the City.
  - (iii) Mark barricades supplied by the Contractor with the name and the telephone number(s) at which the Contractor can be reached twenty-four (24) hours per day, seven (7) days per week.
  - (iv) Provide safety for the worker.
  - (v) Provide safety and convenience for motorists, cyclists, and pedestrians.
  - (vi) Ensure all temporary traffic control devices are removed or hidden from view when no longer appropriate.
  - (vii) Contact the Traffic Management Branch to report any changes to the location, limits, or duration of any lane closures.
  - (viii) Notify lane closure reopening to the Traffic Management Branch.
- (b) The Contractor shall take all other safety measures necessary to cope with any peculiar or unusual circumstances that have not been set out in the Manual and shall, at all times, ensure that maximum protection is afforded to the road user and that his/her operations in no way interfere with the safe operation of traffic, cyclists, or pedestrians.
- (c) Improper signing will be sufficient reason for the Contract Administrator or Inspector to order the Works to cease on Site.
- (d) During the hours when the Contractor is not working, equipment and stockpiled materials shall be left in such a location so as not to interfere with or present a hazard to motorists, cyclists, or pedestrians.
- (e) Emergency vehicle access must be maintained at all times.
- (f) The Contractor is not allowed to close any traffic lane during the time period of July 24 to August 13 inclusive, to accommodate the Canada Summer Games special event.

- (g) The Contractor is permitted a total of twenty-one (21) consecutive lane closure days for completing concrete repair Type 9.

#### E4.4 Measurement and Payment

##### E4.4.1 Traffic Control

- (a) No separate measurement or payment shall be made for this Work. This Item of Work shall be included in the applicable Concrete Repair Type Contract Unit Price as per Specification E6, Clause E6.6.2, which price shall be paid in full for supply of all materials and performing all operations herein described and all other items incidental to the Work.

### E5. CONCRETE REMOVALS

#### E5.1 Description

- (a) This Specification shall cover all operations relating to the removal and disposal of concrete for Repair Types 1, 6, 7, 8 and 9, as specified herein and as shown on the Drawings. This Specification shall cover concrete removal Works, including all necessary staging, demolition, removal, salvaging, transporting, unloading, stockpiling, dismantlement, and disposal of applicable materials.
- (b) 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 Works as hereinafter specified.

#### E5.2 Scope of Work

- (a) The Work under this Specification shall include the removal and disposal of existing concrete to the limits as shown on the Drawings for Repair Types 6, 7, 8 and 9 or as otherwise directed by the Contract Administrator.
- (b) Removing concrete with appropriate equipment satisfactory to the Contract Administrator.
- (c) Providing saw cuts where necessary to limit the extent of demolition.
- (d) Repairing any over demolition and reinforcing damage to the satisfaction of the Contract Administrator.
- (e) All concrete removal materials shall revert to the Contractor for off-site disposal.

#### E5.3 Submittals

- (a) The Contractor shall submit to the Contract Administrator for review and approval, at least ten (10) Business Days prior to the commencement of any scheduled Work on the Site, a proposed schedule, including methods and sequence of operations.

#### E5.4 Materials

##### E5.4.1 General

- (a) 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.
- (b) 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.

#### E5.5 Equipment

##### E5.5.1 General

- (a) All equipment shall be of a type acceptable to the Contract Administrator and shall be kept in good working order.

#### E5.5.2 Demolition Catch Platforms and Work Platforms

- (a) The Contractor shall provide all necessary access/work platforms to facilitate concrete removals and associated inspection of all Works by the Contract Administrator.
- (b) Any proposal to drill into the existing bridge structure to secure any platforms must be submitted in writing to the Contract Administrator for review and acceptance prior to proceeding with any Work.

#### E5.6 Construction Methods

##### E5.6.1 General

- (a) Concrete shall be removed to the limits shown on the Drawings. Any unsound concrete detected beyond the removal extents depicted in the Drawings shall be reported to the Contract Administrator immediately. Removals beyond the limits shown on the Drawings shall only proceed as directed by and in the presence of the Contract Administrator.
- (b) The Contractor shall prevent movement, settlement, or damage of existing structures to remain, services, paving, trees, landscaping and adjacent grades. If the safety of the structure and/or existing structures or services appears to be endangered during structural removal operations, the Contractor shall cease operations and notify the Contract Administrator immediately.
- (c) The Contractor shall be fully responsible for ensuring the public safety in all areas, and will be held responsible for any loss or damage caused due to neglect by the Contractor or his employees.
- (d) Under no circumstances shall the Contractor close any portion of existing roadways or walkways to traffic without prior written approval of the Contract Administrator. If any existing roadway is to be closed to traffic in no case shall the Contractor commence any construction operations until such time as all the signs, barricades, and flashers have been erected to the satisfaction of the Contract Administrator.
- (e) Remove concrete and other removal items with appropriate equipment satisfactory to the Contract Administrator. Jackhammers heavier than nominal 14 kg class and chipping hammers heavier than nominal 7 kg class shall not be used. The Contractor shall take all necessary precautions to ensure that material do not fall onto any roadways or sidewalks during removal operations.
- (f) In no case will the Contractor be permitted to use removal equipment, or other equipment or methods which may cause damage to any remaining structural elements or to any new construction. In the event that any element is damaged, the Contractor shall repair such element at his own expense to the satisfaction of the Contract Administrator.
- (g) The Contractor shall only use methods of concrete removal that will not damage the existing structure to remain or new structures.
- (h) Provide sawcuts where necessary to limit the extent of demolition.
- (i) Repair any over demolition and reinforcing steel damage to the satisfaction of the Contract Administrator.

##### E5.6.2 Details of Existing Structure

- (a) The applicable details and structure dimensions of the existing structures are shown on the Drawings for information only in establishing the methods and limits of Work.
- (b) The accuracy of this information is not guaranteed and the Contractor must verify all information before commencing Work.

##### E5.6.3 Waste Handling and Disposal of Removed Materials

- (a) Wherever practical, the Contractor shall recycle disposed materials.
- (b) The Contractor shall promptly haul all removed materials indicated for disposal, off and away from the site. No storage of any materials on-site will be allowed without written approval from the Contract Administrator. It shall be the Contractor's responsibility to find suitable disposal areas away from the site.

**E5.7 Quality Control**

**E5.7.1 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.
- (a) 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.

**E5.7.2 Access**

- (a) The Contractor shall allow the Contract Administrator free access to all parts of the Work at all times. The Contractor shall supply samples to the Contract Administrator or his inspector for testing purposes as required. There will be no charge to the City for samples taken.

**E5.8 Measurement and Payment**

**E5.8.1 Concrete Removals**

- (a) No separate measurement or payment shall be made for this Work. This Item of Work shall be included in the applicable Concrete Repair Type Contract Unit Price as per Specification E6, Clause E6.6.2, which price shall be paid in full for supply of all materials and performing all operations herein described and all other items incidental to the Work.

**E6. CONCRETE REPAIRS**

**E6.1 Description**

**E6.1.1** The Work covered under this item shall include all operations relating to the construction of local concrete repairs, as herein specified and shown on the Drawings for repair Types 1, 2, 3, 4, 5, 6, 7, 8 and 9. The specific locations and extents of repairs will be marked out by the Contract Administrator. Additional locations may be required as directed by the Contract Administrator.

**E6.1.2** 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.

**E6.2 Scope of Work**

- (a) Construction of local concrete repair types as shown on the Drawings, including the following Work:
  - (i) Access/Work Platforms
  - (ii) Traffic Control
  - (iii) Concrete Removals
  - (iv) Concrete Repair
  - (v) Surface Preparation and Arc Spray Zinc Metallizing
- (b) Quality Control and Quality Assurance testing, including retention of a third-party testing company, acceptable to the Contract Administrator, retained and paid for by the Contractor. Quality Control testing shall be undertaken by the Contractor.



## E6.3 Materials

### E6.3.1 General

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

### E6.3.2 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 CAN/CSA-A23.1.

### E6.3.3 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. There shall be no charge to the City for any materials taken by the Contract Administrator for testing purposes.
- (b) All materials shall be approved by the Contract Administrator at least seven (7) 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 Specifications detailed herein or are found to be defective in manufacture or have become damaged in transit, storage, or handling operations, then such materials shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.

### E6.3.4 Bonding Agents

- (a) Latex Bonding Agent
  - (i) Latex bonding agent shall be SikaCem 810, or equal as approved by the Contract Administrator.
- (b) Bonding Grout
  - (i) Grout for bonding new concrete to existing concrete, if used, may consist of the following constituents by weight:
    - 1 part water;
    - 1 part latex bonding agent; and
    - 1 ½ parts Type GUSF Portland Cement
  - (ii) The consistency of the bonding grout shall be such that it can be brushed on the existing concrete surface in a thin, even coating that will not run or puddle in low spots.

### E6.3.5 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.

### E6.3.6 Patching Mortar for Minor Surface Defects

- (a) The use of patching mortar shall be limited to patching minor new surface defects as directed by the Contract Administrator. Patching Mortar is not to be used for general concrete repairs.
- (b) The patching mortar shall be made of the same cementitious material and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than 1 part cement to 2 parts sand by damp loose volume. White Portland Cement shall be substituted for a part of the grey Portland Cement on exposed concrete in order to produce a colour matching the colour of the surrounding concrete, as determined by a trial patch. The quantity of mixing water shall be no more than necessary for handling and placing.

#### E6.3.7 Formwork

- (a) Formwork materials shall conform to CSA Standard CAN/CSA-A23.1, and American Concrete Publication SP:4, "Formwork for Concrete".
- (b) No "stay-in-place" formwork or falsework is permitted.
- (c) Form sheeting plywood to be covered with form liner or to be directly in contact with soil shall be exterior Douglas Fir, concrete form grade, conforming to CSA Standard O121-M1978, a minimum of 20 mm thick.
- (d) Where form liner is not being used, form sheeting shall be Douglas Fir, overlay form liner type conforming to CSA Standard O121-M1978. Approved manufacturers are "Evans" and "C-Z".
- (e) Boards used for formwork shall be fully seasoned and free from defects such as knots, warps, cracks, etc., which may mark the concrete surface.
- (f) No formwork accessories will be allowed to be left in place within 50 mm of the surface following form removal. Items to be left in place must be made from a non-rusting material or galvanized steel; and they shall not stain, blemish, or spall the concrete surface for the life of the concrete.
- (g) Forms for exposed concrete surfaces that do not require a form liner may be either new plywood or steel as authorized by the Contract Administrator.
- (h) Studding shall be spruce or pine and shall have such dimensions and spacing that they shall withstand distortion from all the forces to which the forms will be subjected. Minimum dimensions shall be 50 mm x 150 mm.
- (i) Walers shall be spruce or pine, with minimum dimensions of 100 mm x 150 mm.
- (j) All forms are incidental to these Works and must be removed by the Contractor once adequate strength and curing of the concrete has been achieved.

#### E6.3.8 Stainless Steel Welded Wire Mesh

- (a) All stainless steel welded wire mesh shall conform to the requirements of AISI 304. If, in the opinion of the Contract Administrator, any mesh provided for the concrete works exhibits flaws in manufacture or fabrication, such material shall be immediately removed from the Site and replaced with acceptable mesh.

#### E6.3.9 Adhesive Anchors

- (a) Anchors shall be of a type approved by the Contract Administrator. They shall be made from stainless steel and shall not stain, blemish, or spall the concreted surface for the life of the concrete.
- (b) Anchor accessories shall include wire ties, wire (18 gauge minimum), or other similar devices that may be approved by the Contract Administrator.
- (c) Adhesive shall be epoxy two-part injectable, acceptable product is Hilti RE500, or equipment as accepted by the Contract Administrator.

#### E6.3.10 Patching Grout

- (a) Concrete repair material shall be compatible with the concrete substrate and the Contractor's method of placement. The Contractor shall use MasterEmaco S440MC low shrink high early strength concrete grout or equivalent, subject to the approval of the Contract Administrator.
- (b) Repair mortars must also meet the following special requirement to ensure compatible behaviour with the corrosion control system:
  - (i) 28-day moist cured electrical resistivity less than 15,000 ohm-cm
- (c) The workability of the repair mortar shall be consistent with the Contractor's placement operations.
- (d) Any proposed proprietary repair mortar shall be subject to the approval of the Contract Administrator.

E6.3.11 Miscellaneous Materials

- (a) The Contractor shall supply all materials, as approved by the Contract Administrator, to ensure the satisfactory completion of the concrete works.

E6.4 Equipment

E6.4.1 General

- (a) All equipment shall be of a type accepted by the Contract Administrator. The equipment shall be in good working order, kept free from hardened concrete or foreign materials, and shall be cleaned at frequent intervals.
- (b) The Contractor shall have sufficient standby equipment available on short notice at all times.

E6.4.2 Miscellaneous Equipment

- (a) The Contractor shall provide all miscellaneous equipment as required to properly and thoroughly execute and complete all operations related to the supply and placement of concrete.

E6.5 Construction Methods

E6.5.1 General

- (a) The Contractor shall form and use pressure grout application methods for all types of concrete repairs as shown on the Drawings. Other methods shall be subject to the approval of the Contract Administrator.

E6.5.2 Preparation for Concreting Against Hardened Concrete

- (a) All hardened concrete against which new concrete is to be placed shall be prepared in the following manner:
  - (i) Following the completion of concrete removals, all surfaces at the cold joint interface including concrete and exposed reinforcing steel are to be sandblasted to the requirements of SSPC-SP6/NACE No. 3 Commercial Blast Cleaning to reveal a clean substrate and kept clean until concrete placement. Sandblasting shall be followed by a high pressure water wash to remove all residues.

E6.5.3 Formwork and Shoring

- (a) Formwork shall be designed, erected, braced, and maintained to safely support all vertical and lateral loads until such loads can be supported by the concrete.
- (b) As a maximum, the following spacings shall apply, for studding and whaling:
  - (i) 20 mm plywood: studding – 450 mm centre to centre
  - (ii) Walers – 760 mm centre to centre
- (c) Forms shall be clean before use. Plywood and other wood surfaces shall be sealed against adsorption of moisture from the concrete by a field-applied form coating or a factory-applied liner.
- (d) Form accessories to be partially or wholly embedded in the concrete, such as ties and hangers, shall be a commercially manufactured type. The portion remaining within the concrete shall leave no metal within 50 mm of the surface when the concrete is exposed to view. Spreader cones on ties shall not exceed 25 mm in diameter.
- (e) All exposed edges shall be chamfered 25 mm unless otherwise noted on the Drawings.
- (f) Slots, recesses, chases, sleeves, inserts, bolts, hangers, and other items shall be formed or set in coordination and cooperation with the trade concerned. No openings shall be made in structural members that are not shown on the structural drawings without the prior approval of the Contract Administrator.

- (g) Shores shall be provided with positive means of adjustment (jacks or wedges). All settlement shall be taken up before or during concreting as required.
- (h) Mud sills of suitable size shall be provided beneath shores, bedded in sand or stone, where they would otherwise bear on soil. The soil below shores must be adequately prepared to avoid settlements during or after concreting. Shores must not be placed on frozen ground.
- (i) Brace shores horizontally in two directions and diagonally in the same two vertical planes so that they can safely withstand all dead and moving loads to which they will be subjected.
- (j) The loads and lateral pressures outlined in Part 3, Section 102 of "Recommended Practice for Concrete Formwork" (ACI 347) and wind loads as specified by the National Building Code shall be used for design. Additional design considerations concerning factors of safety for formwork elements and allowable settlements outlined in Section 103 of the above reference shall apply.
- (k) Formwork shall have sufficient strengths and rigidity so that the resultant finished concrete conforms to the shapes, lines and dimensions of the members shown on the Drawings.
- (l) Formwork shall be constructed to permit easy dismantling and stripping and such that removal will not damage the concrete. Provision shall be made in the formwork for shores to remain undisturbed during stripping where required.
- (m) Forms shall be constructed and maintained so that the completed Work is within minus 3 mm or plus 6 mm of the dimensions shown on the Drawings.
- (n) Formwork shall be cambered, where necessary to maintain the specified tolerances, to compensate for anticipated deflections in the formwork due to the weight and pressure of the fresh concrete and due to construction loads.
- (o) Forms shall be sufficiently tight to prevent leakage of grout or cement paste.
- (p) Form panels shall be constructed so that the contact edges are kept flush and aligned.
- (q) All form lumber, studding, etc. becomes the property of the Contractor when the Work is finished, and it shall be removed from the concrete and the Site by the Contractor after the concrete is set, free of extra charge, and the entire Site left in a neat and clean condition.

#### E6.5.4 Bonding New Concrete to Existing Concrete

- (a) The Contractor is responsible to create a bond between the new mortar/grout and the existing substrates. This may be done by either the application of a suitable bonding agent or grout or by using a self-bonding mortar or concrete. The Contract Administrator will check all repaired areas for bond using a hammer "sounding" method after form removal. Place mortar or concrete by trowelling, pumping, or into forms ensuring that all entrapped air is removed.
- (b) Should a bonding grout be used, it shall be applied immediately before concrete placement. It shall be thoroughly brushed onto the existing hardened concrete surface in a thin and even coating that will not puddle.

#### E6.5.5 General Curing

- (a) The use of curing compound will not be allowed on concrete areas that are to receive additional concrete or waterproofing.
- (b) Unformed concrete surfaces shall be covered and kept moist by means of wet polyester blankets for seven (7) consecutive days immediately following finishing operations or otherwise approved by the Contract Administrator and shall be maintained at above 10°C for at least seven (7) consecutive days thereafter. Construction joints shall only be covered and kept saturated by means of wet polyester curing blankets for the curing period.

- (c) If permitted for use, curing compounds shall be applied at the rate of not less than 4 m<sup>2</sup>/L. The compound must be applied uniformly and by roller. Spraying of the compound will not be permitted.
- (d) 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.
- (e) Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3° in any one hour period or 20° in any twenty-four hour period.
- (f) Formed surfaces shall receive, immediately after stripping and patching, the same application of curing compound as finished surfaces.
- (g) After completing the finishing of unformed surfaces, where curing compound is not permitted, the surfaces shall be promptly covered with a minimum of a single layer of clean, damp polyester curing blanket and 6 mil polyethylene.
- (h) Care shall be exercised to ensure that the polyester curing blanket is well drained and that it is placed as soon as the surface will support it without deformation. The Contractor shall ensure that water from the polyester curing blankets does not run into areas where concrete placement and finishing operations are underway. If this occurs, concrete placement shall stop until the problem is corrected satisfactory to the Contract Administrator.

#### E6.5.6 Form Removal

- (a) All forms shall remain in place for a minimum of seven (7) days. The Contract Administrator must be notified at least 24 hours prior to any form removal. The Contractor must receive approval from the Contract Administrator prior to beginning Work.
- (b) Field-cured test specimens, representative of the in-place concrete being stripped, may be tested to verify the concrete strength

#### E6.5.7 Patching of Formed Surfaces

- (a) Immediately after forms have been removed, but before any repairing or surface finishing is started, the concrete surface shall be inspected by the Contract Administrator. Any repair or surface finishing started before this inspection may be rejected and required to be removed.
- (b) All formed concrete surfaces shall have bolts, ties, struts, and all other timber or metal parts not specifically required for construction purposes cut back fifty (50) mm from the surface before patching.
- (c) Minor surface defects caused by honeycomb, air pockets greater than 5 mm in diameter, and voids left by strutting, and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the area to be patched and then applying patching mortar. A slurry grout consisting of water and cement shall be thoroughly brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck-off slightly higher than the adjacent surface and left for one hour before final finishing to permit initial shrinkage of the patching mortar and it shall be touched up until it is satisfactory to the Contract Administrator. The patch shall be cured as specified in this Specification, and the final colour shall match the surrounding concrete.
- (d) All objectionable fins, projections, offsets, streaks, or other surface imperfections shall be removed by approved means to the Contract Administrator's satisfaction. Cement washes of any kind shall not be used.
- (e) Concrete shall be cast against forms that will produce plane surfaces with no bulges, indentations, or protuberances other than those shown on the Drawings. The arrangement of panel joints shall be kept to a minimum. Panels containing worn edges, patches, or other defects that will impair the texture of concrete surfaces shall not be used. All fins on the concrete surfaces shall be removed.

- E6.5.8 Type 1 Repair
- (a) Concrete removal in accordance with E5
  - (b) Concrete repair in accordance with E6
- E6.5.9 Type 2, 3, 4, 5 Repairs
- (a) Surface preparation and arc spray zinc metallizing in accordance with E7
- E6.5.10 Type 6 Repair
- (a) Concrete removal in accordance with E5
  - (b) Surface preparation and arc spray zinc metallizing in accordance with E7
- E6.5.11 Type 7 and 8 Repairs
- (a) Concrete removal in accordance with E5
  - (b) Concrete repair in accordance with E6
  - (c) Surface preparation and arc spray zinc metallizing in accordance with E7
- E6.5.12 Type 9 Repair
- (a) Traffic control in accordance with E4
  - (b) Concrete removal in accordance with E5. The Contractor shall perform the concrete removals in stages. The deck soffit and girder flange concrete shall be removed in Stage 1, followed by removal of the girder web concrete in Stage 2, after curing and form removal is complete on the deck soffit and girder flange repair.
  - (c) Concrete repair in accordance with E6. The Contractor shall perform the concrete repair in stages. The deck soffit and girder flange shall be repaired in Stage 1, followed by repair of the girder web in Stage 2, after curing and form removal is complete on the deck soffit and girder flange repair.
  - (d) Surface preparation and arc spray zinc metallizing in accordance with E7
- E6.5.13 Clean Up
- (a) The Contractor shall maintain the Sites of Work in a tidy condition and free from the accumulation of waste and debris to the satisfaction of the Contract Administrator.
- E6.6 Measurement and Payment
- E6.6.1 Handrail Curb Repairs
- (a) Handrail curb repairs will be measured on a unit basis and paid for at the Contract Unit Price for "Type 1 Concrete Repair". The amount to be paid for will be the total number of handrail curb locations repaired in accordance with this Specification, accepted and measured by the Contract Administrator.
- E6.6.2 Concrete Repairs
- (a) Concrete repairs will be measured on an area basis and paid for at the Contract Unit Price per square metre for the "Items of Work" listed here below, which price shall be paid 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. **The area to be paid for shall be the area of activated arc spray zinc metallizing.**

Items of Work:

Concrete Repairs

- a) Type 2
- b) Type 3
- c) Type 4
- d) Type 5
- e) Type 6
- f) Type 7

- g) Type 8
- h) Type 9

## **E7. ACTIVATED ARC SPRAY ZINC METALLIZING**

### **E7.1 Description**

E7.1.1 This Specification shall cover all operations related to the supply and installation of activated arc zinc spray (metallizing) onto designated concrete surfaces, including required electrical connections, protection of bearings, materials, testing, and ensuring continuity of the reinforcing steel as outlined in this Specification and as shown on the Contract Drawings. Schematic activated arc spray zinc metallizing extents and details are shown on the Drawings. Actual locations will be as directed by the Contract Administrator.

E7.1.2 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.

### **E7.2 References**

- (a) ACI 222R Protection of Metals in Concrete Against Corrosion
- (b) ASTM B833 Specification for Zinc Wire
- (c) ASTM B6 Standard Specification for Zinc

### **E7.3 Submittals**

E7.3.1 Submit qualifications of National Association of Corrosion Engineers (NACE) – certified Cathodic Protection Technician and certified Cathodic Protection Specialist employed by the activated zinc metallizing technology company. Qualifications shall include a copy of NACE certifications and documentation verifying experience in the installation and testing of galvanic protection systems for reinforced concrete structures.

E7.3.2 Submit quality control program approved by the Cathodic Protection Technician that includes verification of anode thickness and bond testing. Submittal shall be approved by the Contract Administrator prior to any field installations. Measurements taken during the execution of the quality control program shall be clearly documented and submitted to the Contract Administrator.

E7.3.3 Submit qualification of personnel operating arc spray zinc metallizing equipment.

### **E7.4 Materials**

#### **E7.4.1 General**

- (a) The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification.
- (b) All materials supplied under this Specification shall be subject to inspection and approval by the Contract Administrator.
- (c) The zinc spray shall be Galvanode ASZ+ humectant-activated metallized zinc coating system by Vector Corrosion Technologies, Winnipeg, MB (204) 289-6300.  
[www.vector-corrosion.com](http://www.vector-corrosion.com) or equivalent as approved by the Contract Administrator.

#### **E7.4.2 Thermal Spray Zinc Wire**

- (a) The thermal spray zinc wire shall be 5 mm (3/16") diameter 99.99% pure zinc wire as approved by the Contract Administrator. The zinc wire shall be in compliance with ASTM B6 Special High Grade Specification for Zinc Wire.
- (b) The Contractor shall submit mill certificates for the zinc spray wire to the Contract Administrator for review at least 5 working days before the start of zinc spray application.

- (c) Zinc wire shall be stored in accordance with the manufacturer's recommendations.

#### E7.4.3 Blasting Abrasive

- (a) Blasting abrasive shall be non-metallic and free of corrosion producing contaminants. Sand abrasive shall be oil free. Slag abrasive shall contain no more than 0.1% oil by weight.

#### E7.4.4 Humectant

- (a) Humectant shall be Galvanode Humectant activator solution or equivalent as approved by the Contract Administrator. Humectant shall be a 300 g/L aqueous lithium bromide solution (LiBr) containing 10 ml/L surfactant, or equivalent as approved by the Contract Administrator.

#### E7.4.5 Miscellaneous Materials

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

### E7.5 Equipment

- E7.5.1 Equipment shall be portable electric arc type specifically designed for application of metallized zinc coatings using 5 mm (3/16") diameter high purity zinc wire, or equivalent as approved by the Contract Administrator.

- E7.5.2 Equipment operation shall be performed by personnel with verifiable experience on projects of similar size and scope. The Contractor shall submit qualifications of personnel to the Contract Administrator for review at least 5 working days before the start of zinc spray application.

### E7.6 Construction Methods

#### E7.6.1 Surface Preparation

- (a) General
  - (i) The Contractor shall comply with all applicable environmental health and safety regulations related to surface preparation of the existing concrete surfaces.
  - (ii) As a minimum, the Contractor shall collect all spent blasting abrasives and cleaned off concrete residue from the work area. All such materials shall be disposed of off and away from the Site by the Contractor in accordance with the appropriate regulations to the satisfaction of the Contract Administrator.
- (b) Unless noted otherwise on the Drawings, surface preparation shall be carried out as follows:
  - (i) All oil and grease shall be removed from the concrete before any blast cleaning or thermal spray application is carried out. All loose, cracked, or delaminated concrete shall be removed prior to blast cleaning. The Contractor shall allow 28 days curing time of the concrete repair areas prior to application of Activated Arc Spray Zinc.
  - (ii) The concrete surface shall be blast cleaned in accordance with SSPC-SP 13/NACE No. 6, Surface Preparation of Concrete. The blast cleaning shall remove all contaminates, corrosion products, laitance, and weak concrete. The blast cleaning shall provide a sound concrete surface for the zinc coating to bond to.
  - (iii) Exposed reinforcing bars shall be cleaned to SSPC-SP 10/NACE No. 2, Near-White Blast Cleaning.
  - (iv) The Concrete shall be clean, dry and dust free prior to application of the zinc coating. This shall be attained by blowing the surface with dry compressed air, and vacuum cleaning if required. The ambient air temperature and the concrete substrate temperature shall be a minimum of 5°C before applying the zinc coating.



#### E7.6.2 Rebar Connections

- (a) Unless noted otherwise on the Drawings, there shall be a minimum of two connections per vertical face to be protected. Connections are to be established with vertical reinforcing bars. The same reinforcing bar may not be connected to twice. Connections shall not be established with prestressing strands.
- (b) Rebar connections can be established at locations where steel is exposed by removal of spalled and delaminated concrete. If no exposed steel exists, locate reinforcing steel with rebar locator and chip out or drill concrete to expose rebar.
- (c) The rebar connection shall consist of 6 mm (1/4 in) galvanized threaded rod drilled and tapped into the embedded reinforcing steel. Threaded rod shall be of sufficient length to protrude a minimum of 50 mm (2 in) from concrete surface. Connection between threaded rod and rebar shall be sealed with 100% solids, non-conductive epoxy such that no part of the connection will be in contact with the concrete when patching is complete.
- (d) Electrical continuity should be verified between rebar connections and between rebar connections and rebar in spalled concrete locations with a multi-meter. Readings greater than 1mV potential between locations shall indicate discontinuous rebar. Discontinuous steel shall be made continuous by installation of a continuity bond using continuous steel.

#### E7.6.3 Zinc Spraying

- (a) Before spraying zinc, protect bearings so that metallizing will not in any way damage or interfere with the proper functioning of the bearings. Protection methods are to be approved by the Contract Administrator prior to metallizing. An accepted protection method is blocking with plywood sheets.
- (b) Apply the zinc to the surface of dry, prepared concrete using multiple 3 to 4 mil thick passes applied at 90° to each other until a minimum thickness of 508 µm (20 mils) is achieved.
- (c) Install a 100 mm x 100 mm (4 in x 4 in) flattened expanded zinc mesh plate at each rebar connection. Zinc plate shall be bolted to the surface over the threaded rebar connections using galvanized steel nuts and galvanized washers.
- (d) After the plate is tightened in place, an additional layer of zinc is applied at 508 µm (20 mils) thickness over the connection and the zinc mesh plate. Coating shall extend a minimum of 150 mm (6 in) beyond the edge of the plate in all directions.

#### E7.6.4 Humectant

- (a) After the zinc coating is installed in each area, apply humectant solution to the surface of the zinc coating by brush, roller or spray in a minimum of two coats, or as specified by the manufacturer. Each coat shall be applied and allowed to dry prior to the application of subsequent coats. Coats shall continue to be applied until the total quantity of activator solution applied is 0.1 liter/m<sup>2</sup> (0.26 gal/100 ft<sup>2</sup>), or as specified by the manufacturer.

#### E7.7 Testing

##### E7.7.1 Coating Thickness

- (a) The thickness of the zinc coating shall be measured using 50 mm x 50 mm squares of tape applied to the concrete surface prior to application of the zinc coating. The tape sample will be removed after the zinc coating is completed and the tape will peel away from the zinc coating. The thickness of the zinc coating sample will then be measured with a micrometer.

#### E7.8 Quality Control

- E7.8.1 All workmanship and all materials furnished and supplied under this Specification are subject to the close and systematic inspection and testing by the Contract Administrator

including all operation from the selection and production of materials through to final acceptance of the work.

E7.8.2 A NACE-qualified Cathodic Protection Technician working under the direction of a NACE-qualified Cathodic Protection Specialist and employed by the activated zinc metallizing technology company shall provide technical Site support during the installation of the galvanic protection system. The Cathodic Protection Technician shall develop and oversee QA/QC procedures for the installation of the galvanic system approved by the Cathodic Protection Specialist. The Cathodic Protection Technician and Cathodic Protections Specialist shall have verifiable experience in the installation and testing of galvanic protection systems for reinforced concrete structures.

E7.8.3 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.

E7.9 Measurement and Payment

E7.9.1 Activated Arc Spray Zinc Metallizing

- (a) No separate measurement or payment shall be made for this Work. This Item of Work shall be included in the applicable Concrete Repair Type Contract Unit Price as per Specification E6, Clause E6.6.2, which price shall be paid in full for supply of all materials and performing all operations herein described and all other items incidental to the Work.
- (b) The price quoted by the Contractor shall not include for the making discontinuous steel continuous by installation of a continuity bond using continuous steel. Such re-establishment of continuity shall be as directed by the Contract Administrator as required and shall be paid on a time and materials basis.