



**THE CITY OF WINNIPEG**

# **TENDER**

**TENDER NO. 372-2020**

**FERMOR AVENUE PEDESTRIAN UNDERPASS NEAR ST. MARY'S ROAD –  
MAINTENANCE WORKS**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 FERMOR AVENUE PEDESTRIAN UNDERPASS NEAR ST. MARY'S ROAD – MAINTENANCE WORKS

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, June 9, 2020.

B2.2 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 view the Site without making an appointment.

### **B4. ENQUIRIES**

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

B4.2 If the Bidder finds errors, discrepancies or omissions in the Tender, 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 Tender 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 Tender 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.

B4.6 Any enquiries concerning submitting through MERX should be addressed to:  
MERX Customer Support  
Phone: 1-800-964-6379  
Email: merx@merx.com

### **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 Tender 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 Tender, 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.
- B6.3 Addenda will be available on the MERX website at [www.merx.com](http://www.merx.com).
- B6.4 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the MERX website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B6.5 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid/Proposal. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.
- B6.6 Notwithstanding B4, enquiries related to an Addendum may be directed to the Contract Administrator indicated in D4.

## **B7. SUBSTITUTES**

- B7.1 The Work is based on the Plant, Materials and methods specified in the Tender.
- 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 B18.
- 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/Proposal;
  - (b) Form B: Prices;
  - (c) Form G1: Bid Bond and Agreement to Bond.
- 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 shall be submitted electronically through MERX at [www.merx.com](http://www.merx.com).
- B8.4.1 Bids will **only** be accepted electronically through MERX.
- B8.5 Bidders are advised that inclusion of terms and conditions inconsistent with the Tender document, including the General Conditions, will be evaluated in accordance with B18.1(a).

## **B9. BID**

- B9.1 The Bidder shall complete Form A: Bid/Proposal, making all required entries.
- B9.2 Paragraph 2 of Form A: Bid/Proposal 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/Proposal, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B9.4 Paragraph 13 of Form A: Bid/Proposal 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/Proposal should be entered below such signatures.
- 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.
- B10.1.1 Prices stated on Form B: Prices shall not include any costs which may be incurred by the Contractor with respect to any applicable funding agreement obligations as outlined in D26. Any such costs shall be determined in accordance with D26.
- 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).
- B10.5 The Bidder shall enter the Total Bid Price from Form B: Prices into the Total Bid Price field in MERX.
- B10.5.1 Bidders are advised that the calculation indicated in B18.4 will prevail over the Total Bid Price entered in MERX.
- B10.6 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).VERSION 3 - Use this version with VERSION 3 of Form B: Prices for lump sum price contracts with separate prices for adjustment. Insert a concise description and specification reference in 0 for each item for which a separate price is required.

## **B11. DISCLOSURE**

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

B11.2 The Persons are:

- (a) N/A

**B12. CONFLICT OF INTEREST AND GOOD FAITH**

B12.1 Further to C3.2, Bidders, by responding to this Tender, declare that no Conflict of Interest currently exists, or is reasonably expected to exist in the future.

B12.2 Conflict of Interest means any situation or circumstance where a Bidder or employee of the Bidder proposed for the Work has:

- (a) other commitments;
- (b) relationships;
- (c) financial interests; or
- (d) involvement in ongoing litigation;

that could or would be seen to:

- (i) exercise an improper influence over the objective, unbiased and impartial exercise of the independent judgment of the City with respect to the evaluation of Bids or award of the Contract; or
- (ii) compromise impair or be incompatible with the effective performance of a Bidder's obligations under the Contract;
- (e) has contractual or other obligations to the City that could or would be seen to have been compromised or impaired as a result of its participation in the Tender process or the Work; or
- (f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the Tender process) of strategic and/or material relevance to the Tender process or to the Work that is not available to other bidders and that could or would be seen to give that Bidder an unfair competitive advantage.

B12.3 In connection with its Bid, each entity identified in B12.2 shall:

- (a) avoid any perceived, potential or actual Conflict of Interest in relation to the procurement process and the Work;
- (b) upon discovering any perceived, potential or actual Conflict of Interest at any time during the Tender process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Contract Administrator; and
- (c) provide the City with the proposed means to avoid or mitigate, to the greatest extent practicable, any perceived, potential or actual Conflict of Interest and shall submit any additional information to the City that the City considers necessary to properly assess the perceived, potential or actual Conflict of Interest.

B12.4 Without limiting B12.3, the City may, in its sole discretion, waive any and all perceived, potential or actual Conflicts of Interest. The City's waiver may be based upon such terms and conditions as the City, in its sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Bidder to put into place such policies, procedures, measures and other safeguards as may be required by and be acceptable to the City, in its sole discretion, to avoid or mitigate the impact of such Conflict of Interest.

B12.5 Without limiting B12.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in its sole discretion:

- (a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of its employees proposed for the Work;
- (b) require the removal or replacement of any employees proposed for the Work that has a perceived, actual or potential Conflict of Interest that the City, in its sole discretion, determines cannot be avoided or mitigated;



- (c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B12.4 to avoid or mitigate a Conflict of Interest; and
- (d) disqualify a Bidder if the Bidder, or one of its employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.

B12.6 The final determination of whether a perceived, potential or actual Conflict of Interest exists shall be made by the City, in its sole discretion.

### **B13. QUALIFICATION**

B13.1 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.

B13.2 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 <https://www.winnipeg.ca/matmgt/Templates/files/debar.pdf>

B13.3 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);

B13.4 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™) in the form of:
  - (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/>).

B13.5 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.

B13.6 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.

#### **B14. BID SECURITY**

B14.1 The Bidder shall include in its Bid Submission bid security in the form of a digital bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in Form G1: Bid Bond and Agreement to Bond, available on The City of Winnipeg, Corporate Finance, Materials Management Division website at <https://www.winnipeg.ca/MatMgt/templates/files/eBidsecurity.pdf>.

B14.2 Bid security shall be submitted in a digital format meeting the following criteria:

- (a) The version submitted by the Bidder must have valid digital signatures and seals;
- (b) The version submitted by the Bidder must be verifiable by the City with respect to the totality and wholeness of the bond form, including: the content; all digital signatures and digital seals; with the surety company, or an approved verification service provider of the surety company.
- (c) The version submitted must be viewable, printable and storable in standard electronic file formats compatible with the City, and in a single file. Allowable formats include pdf.
- (d) The verification may be conducted by the City immediately or at any time during the life of the bond and at the discretion of the City with no requirement for passwords or fees.
- (e) The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding B14.2(b).

B14.3 Bonds failing the verification process will not be considered to be valid and the bid shall be determined to be non-responsive in accordance with B18.1(a).

B14.4 Bonds passing the verification process will be treated as original and authentic.

B14.4.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.

B14.5 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly formed with the successful Bidder and the contract securities are furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.

B14.6 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Tender.

#### **B15. OPENING OF BIDS AND RELEASE OF INFORMATION**

B15.1 Bids will not be opened publicly.

B15.2 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 MERX website at [www.merx.com](http://www.merx.com).

B15.3 After award of Contract, the name(s) of the successful Bidder(s) and their Contract amount(s) will be available on the MERX website at [www.merx.com](http://www.merx.com).

B15.4 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).

B15.4.1 To the extent permitted, the City shall treat as confidential information, those aspects of a Bid Submission identified by the Bidder as such in accordance with and by reference to Part 2, Section 17 or Section 18 or Section 26 of The Freedom of Information and Protection of Privacy Act (Manitoba), as amended.

## **B16. IRREVOCABLE BID**

B16.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid/Proposal.

B16.2 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 until a Contract for the Work has been duly formed and the contract securities have been furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid/Proposal.

## **B17. WITHDRAWAL OF BIDS**

B17.1 A Bidder may withdraw his/her Bid without penalty at any time prior to the Submission Deadline.

## **B18. EVALUATION OF BIDS**

B18.1 Award of the Contract shall be based on the following bid evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Tender, or acceptable deviation there from (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B13 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B7.

B18.2 Further to B18.1(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.

B18.3 Further to B18.1(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 qualified.

B18.4 Further to B18.1(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.

B18.4.1 Further to B18.1(a), in the event that a unit price is not provided on Form B: Prices, the City may determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B18.4.2 Bidders are advised that the calculation indicated in B18.4 will prevail over the Total Bid Price entered in MERX.

## **B19. AWARD OF CONTRACT**

B19.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

- B19.2 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 qualified, and the Bids are determined to be responsive.
- B19.2.1 Without limiting the generality of B19.2, 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.
- B19.3 If funding for the Work is provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada, Bidders are advised that the terms of D26 shall immediately take effect upon confirmation of such funding, regardless of when funding is confirmed.
- B19.4 Where an award of Contract is made by the City, the award shall be made to the qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B18.
- B19.4.1 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.

## PART C - GENERAL CONDITIONS

### C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 2020 01 31) 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 Tender 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. FORM OF CONTRACT DOCUMENTS

D2.1 Notwithstanding C4.1(c) and C4.4, the Contract Documents will be provided to the Contractor electronically and there will be no requirement for execution and return to the City by the Contractor. Accordingly, the provisions under C4.4(a) and C4.4(b) are no longer applicable.

#### D3. SCOPE OF WORK

D3.1 The Work to be done under the Contract shall consist of all operations related to concrete spot repairs of exterior and interior stairway walls and underpass roof surface; replacement of construction joint seals along the stairway walls; removal of existing guard rail and hand rail; installation of new guardrail and handrail; repair of stair nosings and treads; sandblasting, prime and painting of interior walls and ceiling; removal of existing stairwell tiles (includes cleaning, priming and painting of concrete substrate); installation of detectable warning tiles; construction of reinforced concrete slab and sidewalk at both north and south entrances, installation of acrylic safety mirrors.

D3.2 The major components of the Work are as follows:

- (a) Traffic & Pedestrian Control;
- (b) Removal of existing 51 x 51 tiles and grout, surface preparation, sandblasting, compressed air cleaning, and repair stairway walls;
- (c) Sandblast, clean, and patch tunnel ceiling surface;
- (d) Prime and paint all underpass wall and roof surfaces, interior and exterior stairwell surfaces, and top curbs;
- (e) Concrete removal and patching at cracked, delaminated, spalled and chipped areas located on stairs, top curb walls and interior stairway walls;
- (f) Installation of localized galvanic anodes at spot repair areas (Type 2 and Type 3 repairs only);
- (g) Remove and replace guardrail at north and south stairwell entrances (only removal on the curved retaining wall guardrail at the north entrance);
- (h) Remove and replace stair handrails at south and north entrances;
- (i) Install reinforced concrete slab and sidewalk modifications at north and south entrances;
- (j) Repair or remove and replace, and install stair nosing and treads;
- (k) Supply and install surface mounted detectable warning tiles on stair landing and cast-in-place detectable warning tiles in a strip at the south end entrance;
- (l) Supply and install acrylic safety dome mirrors; and
- (m) Supply and install light adaptors and specified hardware. Coordinate for Manitoba Hydro to supply and install the new light standards and to de-energize and re-energize the lights.

D3.3 The following shall apply to the Services:

- (a) Universal Design Policy

<http://clkapps.winnipeg.ca/DMIS/DocExt/ViewDoc.asp?DocumentTypeId=2&DocId=3604>

**D4. CONTRACT ADMINISTRATOR**

D4.1 The Contract Administrator is WSP, represented by:

Randy Fingas, P.Eng.  
Senior Engineer

Telephone No. 204 272-2011  
Email Address Randy.Fingas@wsp.com

D4.9 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.

**D5. CONTRACTOR'S SUPERVISOR**

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

**D6. NOTICES**

D6.1 Except as provided for in C22.4, 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/Proposal.

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 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator identified in D4.

D6.3 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following facsimile number:

The City of Winnipeg  
Legal Services Department  
Attn: Director of Legal Services  
Facsimile No.: 204 947-9155

**D7. FURNISHING OF DOCUMENTS**

D7.1 Upon award of the Contract, the Contractor will be provided with 'issued for construction' Contract Documents electronically, including Drawings in PDF format only.

**SUBMISSIONS**

**D8. AUTHORITY TO CARRY ON BUSINESS**

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

## **D9. SAFE WORK PLAN**

- D9.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract Documents, if applicable.
- D9.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Safety/default.stm>
- D9.3 Notwithstanding B13.4 at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated COR Certificate or Annual Letter of good Standing. A Contractor, who fails to provide a satisfactory COR Certificate or Annual Letter of good Standing, will not be permitted to continue to perform any Work.

## **D10. INSURANCE**

- D10.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
  - (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.
  - (c) All risks course of construction insurance in the amount of one hundred percent (100%) of the total Contract Price, written in the name of the Contractor and The City of Winnipeg, at all times during the performance of the Work and until the date of Total Performance.
  - (d) Property insurance for equipment, tools, field office and portable toilets used by the Contractor directly or indirectly in the performance of the Work on project that may be owned, rented leased or borrowed.
- D10.2 Deductibles shall be borne by the Contractor.
- D10.3 The Contractor shall provide the City Solicitor 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 the date specified in C4.1 for the return of the executed Contract Documents, as applicable.
- D10.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.
- D10.5 All policies shall be taken out with insurers duly licensed to carry on business in the Province of Manitoba.

## **D11. CONTRACT SECURITY**

- D11.1 The Contractor shall provide and maintain the performance bond and the labour and material payment bond 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; and



- (b) a labour and material payment bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H2: Labour and Material Payment Bond), in an amount equal to fifty percent (50%) of the Contract Price.

- D11.2 The Contractor shall provide the City Solicitor with the required performance and labour and material payment bonds within seven (7) Calendar Days of notification of the award of the Contract by way of an award letter and 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 Documents, if applicable.
- D11.3 The Contractor shall, as soon as practicable after entering into a contract with a Subcontractor:
- (a) give the Subcontractor written notice of the existence of the labour and material payment bond in D11.1(b); and
  - (b) post a notice of the bond and/or a copy of that bond in a conspicuous location at the Site of the Work.

## **D12. SUBCONTRACTOR LIST**

- D12.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract Documents, if applicable.

## **D13. DETAILED WORK SCHEDULE**

- D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract Documents.
- D13.2 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.
- D13.3 Further to D13.2(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:
- (a) Mobilization;
  - (b) Concrete Repairs;
  - (c) Sandblasting, Cleaning, and Painting all Underpass Surfaces;
  - (d) Installation of Guardrails and Stair Handrails;
  - (e) Demobilization.
- D13.4 Further to D13.2(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.
- D13.5 Further to D13.2(c), the daily manpower schedule shall list the daily number of individuals on the Site for each trade.

## **SCHEDULE OF WORK**

### **D14. COMMENCEMENT**

- D14.1 The Contractor shall not commence any Work until he/she is in receipt of an award letter from the Award Authority authorizing the commencement of the Work.
- D14.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:
    - (i) evidence of authority to carry on business specified in D8;
    - (ii) evidence of the workers compensation coverage specified in C6.15;
    - (iii) the Safe Work Plan specified in D9;
    - (iv) evidence of the insurance specified in D10;
    - (v) the contract security specified in D11;
    - (vi) the Subcontractor list specified in D12;
    - (vii) the detailed work schedule specified in D13.
  - (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.
- D14.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the award letter.
- D14.4 The City intends to award this Contract by June 23, 2020.
- D14.4.1 If the actual date of award is later than the intended date, the dates specified for Commencement, Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

### **D15. SUBSTANTIAL PERFORMANCE**

- D15.1 The Contractor shall achieve Substantial Performance by September 4, 2020.
- 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 re-inspected.
- D15.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

### **D16. TOTAL PERFORMANCE**

- D16.1 The Contractor shall achieve Total Performance by October 9, 2020.
- 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 re-inspected.
- D16.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

## **D17. LIQUIDATED DAMAGES**

- D17.1 If the Contractor fails to achieve Substantial Performance in accordance with the Contract by the day fixed herein for Substantial Performance, the Contractor shall pay the City One Thousand dollars (\$1,000) per Working Day for each and every Working Day following the day fixed herein for Substantial Performance during which such failure continues.
- D17.2 The amount specified for liquidated damages in D17.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Substantial Performance by the day fixed herein for same.
- D17.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

## **D18. COVID-19 SCHEDULE DELAYS**

- D18.1 The City acknowledges that the schedule for this Contract may be impacted by the COVID-19 pandemic. Commencement and progress of the Work shall be performed with due consideration to the health and safety of workers and the public, health directives from various levels of government and in close consultation with the Contract Administrator.
- D18.2 If the Contractor is delayed in the performance of the Work by reason of the COVID-19 pandemic that is beyond his control, the work schedule may be adjusted by a period of time equal to the time lost due to such delays and costs related to such delay will be determined as identified herein.
- D18.3 A minimum of seven (7) Calendar Days prior to the commencement of Work on the Site, the Contractor shall declare whether COVID-19 will affect the start date. The Contractor shall provide sufficient evidence that the delay is directly related to COVID-19 and shall include but may not be limited to staff availability and availability of Materials or work by others.
- D18.4 For any delay identified after Work has commenced, the Contractor shall declare within seven (7) Calendar Days any additional delays related to COVID-19 and shall provide sufficient evidence as indicated in D18.3. Failure to provide this notice will result in no additional time delays being considered by the City.
- D18.5 The work schedule, including the durations identified in D15 to D16 where applicable, will be adjusted to reflect delays accepted by the Contract Administrator. No additional payment will be made for adjustment of schedules except where seasonal work, not previously identified in the Contract, is carried over to the following construction season.
- D18.6 Where Work not previously identified is being carried over solely as a result of delays related to COVID-19, as confirmed by the Contract Administrator, the cost of temporary works to maintain the Work in a safe manner until Work recommences, will be considered by the Contract Administrator. Where the Work is carried over only partially due to COVID-19, a partial consideration of the cost of temporary works will be considered by the Contract Administrator.
- D18.7 Any time or cost implications as a result of COVID-19, as confirmed by the Contract Administrator, shall be documented in accordance with C7.

## **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 C6.26, 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 B13.4, 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 B13.4.

**D22. ENVIRONMENTAL PLANNING**

D22.1 The Contractor shall conduct his operations in accordance with all Federal, Provincial, or other regulations concerning environmental protection and pollution control. It shall be the Contractor's responsibility to familiarize itself with all applicable regulations and to obtain all necessary approval and permits for their operations.

**D23. CLEAN UP**

D23.1 The Contractor shall maintain the site of Work in a tidy condition free from the accumulations of waste and debris.

**D24. PAYMENT**

D24.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

**WARRANTY**

**D25. WARRANTY**

D25.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire one (1) year thereafter unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

**THIRD PARTY AGREEMENTS**

**D26. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS**

D26.1 In the event that funding for the Work of the Contract is provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada, the following terms and conditions shall apply, as required by the applicable funding agreements.

D26.2 Further to D26.1, in the event that the obligations in D26 apply, actual costs legitimately incurred by the Contractor as a direct result of these obligations ("Funding Costs") shall be determined by the actual cost to the Contractor and not by the valuation method(s) outlined in C7.4. In all other respects Funding Costs will be processed in accordance with Changes in Work under C7.

D26.3 For the purposes of D26:

- (a) **“Government of Canada”** includes the authorized officials, auditors, and representatives of the Government of Canada; and
- (b) **“Government of Manitoba”** includes the authorized officials, auditors, and representatives of the Government of Manitoba.

D26.4 Modified Insurance Requirements

D26.4.1 If not already required under the insurance requirements identified in D10, the Contractor will be required to provide wrap-up liability insurance in an amount of no less than two million dollars (\$2,000,000) inclusive per occurrence. Such policy will be written in the joint names of the City, Contractor, Consultants and all sub-contractors and sub-consultants and include twelve (12) months completed operations. The Government of Manitoba and its Ministers, officers, employees, and agents shall be added as additional insureds.

D26.4.2 If not already required under the insurance requirements identified in D10, the Contractor will be required to provide builders' risk insurance (including boiler and machinery insurance, as applicable) providing all risks coverage at full replacement cost, or such lower level of insurance that the City may identify on a case-by-case basis, such as an installation floater.

D26.4.3 The Contractor shall obtain and maintain third party liability insurance with minimum coverage of two million dollars (\$2,000,000.00) per occurrence on all licensed vehicles operated at the Site. In the event that this requirement conflicts with another licensed vehicle insurance requirement in this Contract, then the requirement that provides the higher level of insurance shall apply.

D26.4.4 Further to D10.3, insurers shall provide satisfactory Certificates of Insurance to the Government of Manitoba prior to commencement of Work as written evidence of the insurance required. The Certificates of Insurance must provide for a minimum of thirty (30) days' prior written notice to the Government of Manitoba in case of insurance cancellation.

D26.4.5 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.

D26.5 Indemnification by Contractor

D26.5.1 In addition to the indemnity obligations outlined in C17 of the General Conditions for Construction, the Contractor agrees to indemnify and save harmless the Government of Canada and the Government of Manitoba and each of their respective Ministers, officers, servants, employees, and agents from and against all claims and demands, losses, costs, damages, actions, suit or other proceedings brought or pursued in any manner in respect of any matter caused by the Contractor or arising from this Contract or the Work, or from the goods or services provided or required to be provided by the Contractor, except those resulting from the negligence of any of the Government of Canada's or the Government of Manitoba's Ministers, officers, servants, employees, or agents, as the case may be.

D26.6 Records Retention and Audits

D26.6.1 The Contractor shall maintain and preserve accurate and complete records in respect of this Contract and the Work, including all accounting records, financial documents, copies of contracts with other parties and other records relating to this Contract and the Work during the term of the Contract and for at least six (6) years after Total Performance. Those records bearing original signatures or professional seals or stamps must be preserved in paper form; other records may be retained in electronic form.

D26.6.2 In addition to the record keeping and inspection obligations outlined in C6 of the General Conditions for Construction, the Contractor shall keep available for inspection and audit at all reasonable times while this Contract is in effect and until at least six (6) years after Total Performance, all records, documents, and contracts referred to in D26.6.1 for inspection, copying and audit by the City of Winnipeg, the Government of Manitoba and/or the Government of Canada and their respective representatives and auditors, and to produce

them on demand; to provide reasonable facilities for such inspections, copying and audits, to provide copies of and extracts from such records, documents, or contracts upon request by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada and their respective representatives and auditors, and to promptly provide such other information and explanations as may be reasonably requested by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada from time-to-time.

#### D26.7 Other Obligations

- D26.7.1 The Contractor consents to the City providing a copy of the Contract Documents to the Government of Manitoba and/or the Government of Canada upon request from either entity.
- D26.7.2 If the Lobbyists Registration Act (Manitoba) applies to the Contractor, the Contractor represents and warrants that it has filed a return and is registered and in full compliance with the obligations of that Act, and covenants that it will continue to comply for the duration of this Contract.
- D26.7.3 The Contractor shall comply with all applicable legislation and standards, whether federal, provincial, or municipal, including (without limitation) labour, environmental, and human rights laws, in the course of providing the Work.
- D26.7.4 The Contractor shall properly account for the Work provided under this Contract and payment received in this respect, prepared in accordance with generally accepted accounting principles in effect in Canada, including those principles and standards approved or recommended from time-to-time by the Chartered Professional Accountants of Canada or the Public Sector Accounting Board, as applicable, applied on a consistent basis.

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

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

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

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

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

TENDER NO. 372-2020

FERMOR AVENUE PEDESTRIAN UNDERPASS NEAR ST. MARY'S ROAD – 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: LABOUR AND MATERIAL PAYMENT BOND**  
(See D11)

KNOW ALL MEN BY THESE PRESENTS THAT

\_\_\_\_\_  
his/its heirs, executors, administrators, successors or assigns (hereinafter called the "Principal"), and

\_\_\_\_\_  
his/its heirs, executors, administrators, successors or assigns (hereinafter called the "Surety"), are held and firmly bound unto **THE CITY OF WINNIPEG** (hereinafter called the "Obligee"), for the use and benefit of claimants as herein below defined, in the amount of

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

of lawful money of Canada, for the payment whereof we, the Principal and the Surety jointly and severally bind ourselves firmly by these presents.

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

TENDER NO. 372-2020

FERMOR AVENUE PEDESTRIAN UNDERPASS NEAR ST. MARY'S ROAD – 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 promptly make payment to all claimants as hereinafter defined, for all labour, service and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void, otherwise it shall remain in full force and effect subject, however, to the following conditions:

- (a) A claimant is defined as one having a direct contract with the Principal for labour, service and material, or any of them, used or reasonably required for use in the performance of the contract, labour, service and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment (but excluding rent of equipment where the rent pursuant to an agreement is to be applied towards the purchase price thereof) directly applicable to the Contract;
- (b) The above-named Principal and Surety hereby jointly and severally agree with the Obligee that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work, labour or service was done or performed, or materials were furnished by such claimant, may sue on this bond, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon;
- (c) No suit or action shall be commenced hereunder by any claimant
  - (i) unless claimant shall have given written notice to the Principal and the Surety above-named, within one hundred and twenty (120) days after such claimant did or performed the last of the work, labour or service, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work, labour or service was done or performed. Such notice shall be served by mailing the same by registered mail to the Principal, and Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the Province of Manitoba;

- (ii) after the expiration of one (1) year following the date on which Principal ceased work on said Contract; including work performed under the guarantees provided in the Contract;
  - (iii) other than in a court of competent jurisdiction in the Province of Manitoba.
- (d) The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.
- (e) The Surety shall not be liable for a greater sum than the specified penalty of this bond.

The Principal and Surety hereby agree that The Guarantors' Liability Act (Manitoba) shall apply to this Bond.

IN TESTIMONY WHEREOF, the Principal has hereunto set its hand affixed its seal, and the Surety has caused these presents to be sealed and with its corporate seal duly attested by the authorized signature of its signing authority this

\_\_\_\_\_ 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)



## 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 Tender shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.3 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B7. In every instance where a brand name or design specification is used, the City will also consider approved equals and/or approved alternatives in accordance with B7.
- E1.4 The following are applicable to the Work:

<u>Drawing No.</u>	<u>Specification Title</u>
U-218-20-01	Cover Sheet and Drawing List
U-218-20-02	Design Data and General Notes
U-218-20-03	Proposed General Arrangement Plan and Scope of Work
U-218-20-04	Longitudinal Section, Stair and Handrail Details
U-218-20-05	Guardrail Details (Sheet 1 of 2)
U-218-20-06	Guardrail Details (Sheet 2 of 2)
U-218-20-07	Manitoba Hydro Decorative Acorn Light Standard Adaptor

- E1.5 Reference Drawings:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
U218-67-01 (SW-30)	General Arrangement
U218-67-02 (SW-31)	Reinforcing Steel
U218-67-03 (SW-32)	Miscellaneous Details
U218-67-04 (SW-33)	Electrical Details
U218-81-01	Placement of Sidewalk Asphalt Patch
U218-88-01	Layout of Aluminum Balanced Shoulder Barrier

#### E2. MOBILIZATION AND DEMOBILIZATION

- E2.1 Description
- This Specification covers all operations relating to the mobilization demobilization of the Contractor to the Site, as specified herein.
  - The Work to be done by the Contractor under this Specification shall include the furnishings of all superintendence, overhead, labour, materials, equipment, tools, supplies, completion of all Works as hereinafter specified.
- E2.2 Scope of Work
- Mobilizing and demobilizing on-site Work facilities

- (b) Maintaining and removing and access as needed into the laydown areas

### E2.3 Materials

- (a) All materials supplied under this Specifications 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

#### E2.5.1 Layout of On-Site Work Facilities

- (a) The Contractor shall mobilize all on-site Work and other temporary facilities
- (b) Upon completion of construction activities, the Contractor shall remove all on-site Work and other Facilities

### E2.6 Cellular Telephone Communication

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

### E2.7 Surface Restoration

- (a) Prior to construction, inspect the grasses, pavement within and adjacent to the Site with the Contract Administrator to record the current condition. After construction and Site cleanup is complete, re-inspect the condition with the Contract Administrator.
- (b) Restoration of grassed areas damaged as a result of construction activities shall be restored in accordance with CW 3150. Restoration of grasses areas will not be measured for payment and shall be incidental to the Work.

### E2.8 Measurement and Payment

- (a) The Work associated with "Mobilization and Demobilization" shall be paid on a Lump Sum basis, as accepted by the Contract Administrator. These percentages shall be as follows:
  - (i) 30% when Contract Administrator is satisfied that construction has commenced.
  - (ii) 60% when Substantial Performance has been met.
  - (iii) 10% upon total completion of the project.

## **E3. PEDESTRIAN SAFETY**

E3.1 Pedestrian access to the underpass will be closed during construction. During the project, the Contractor shall ensure the proper signage is in place during the construction to safely accommodate pedestrians through the construction area or if feasible, re-direct any pedestrians around the construction to the sidewalk on the opposite side of the street. The Contractor shall supply, install and maintain signage which will read "Pedestrian Underpass Closed until September 4, 2020. Cross at St. Mary's Road" minimum size 1.0 m wide by 1.0 m high, at each underpass entrance.

E3.2 Supply, install and maintain appropriate barricades and temporary fencing to protect and keep pedestrians safely away from all construction areas and open excavations to the satisfaction of the Contract Administrator. No measurement for payment shall be made for this work.

E3.3 The Contractor shall prepare a pedestrian management plan that shall be submitted at least (3) three business days prior to the start of construction.

**E3.4 Measurement and Payment**

- (a) The Work associated with pedestrian safety will not be measured and will be considered incidental be paid for at a Lump Sum price under "Traffic & Pedestrian Control" in E5 as accepted by the Contract Administrator.

**E4. WATER OBTAINED FROM THE CITY**

- E4.1 Further to clause 3.7 of CW 1120, latest edition, the Contractor shall pay for all costs associated with obtaining water in accordance with the Waterworks By-Law. Sewer charges will not be assessed for water obtained from a hydrant.

**E5. TRAFFIC & PEDESTRIAN CONTROL**

- E5.1 Further to clauses 3.6 and 3.7 of CW 1130:

- (a) In accordance with the Manual of Temporary Traffic Control in Work Areas on City Streets, the Contractor ("Agency" in the manual) is responsible to provide all temporary Traffic Control. The Contractor has the option of using his own forces or providing the services through a Subcontractor. If using the services of a Subcontractor refer to D12 – Subcontractor List.

- E5.2 Further to clauses 3.7 of CW1130:

- E5.2.1 Before proceeding with Mobilization to Site or any lane closures, the Contractor must submit a proposed Traffic Management Plan (Drawing of Sketch) to the Contract Administrator for review and approve at least (10) business days prior to the initial closure. The Contractor must submit a revised Traffic Management Plan to the Contract Administrator for review and approve at least (3) business days prior to any adjustments. The Contract Administrator is to be notified of lane closures at least three (3) business days prior to closures.
- E5.2.2 The Contractor shall be restricted to any lane closures in the eastbound and westbound directions on Fermor Avenue between the peak-hours of 7:00 AM to 9:00 AM and 3:30 PM to 5:30 PM Monday to Friday.
- E5.2.3 The Contractor shall be restricted to a maximum of one lane closure (outside peak hours) in each of the Eastbound and Westbound directions at all times.
- E5.2.4 One pedestrian sidewalk and ambulance/emergency vehicle access must be maintained at all times.
- E5.2.5 Winnipeg Transit services at the two stops on either end of the underpass shall be maintained at all times.

**E5.3 Measurement and Payment**

- (a) The Work associated with lane closures, signage, and traffic management will be paid for at a Lump Sum price under "Traffic & Pedestrian Control" as accepted by the Contract Administrator.

**E6. CONCRETE REPAIRS AND REINFORCED CONCRETE SLAB**

**E6.1 Description**

- (a) This Specification shall cover all concrete repairs inside and outside of the tunnel and entrances, and for the north and south reinforced concrete slab.
- (b) The work to be done under this Specification shall include the furnishings of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary and incidental to the satisfactory performance and completion of all Work hereinafter specified.

**E6.2 Materials**

E6.2.1 General

- (a) The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification. All materials shall be new and within the recommended shelf-life, as approved by the Contract Administrator.

E6.2.2 Non-Shrink Cementitious Grout

- (a) Non-Shrink non-metallic Cementitious Grout shall be Sika 212 or Masterflow 713 or equivalent as approved by the Contract Administrator, in accordance with B7

E6.2.3 Concrete Mix Design Requirements

- (a) The Contractor shall submit a concrete mix design statement to the Contract Administrator that reflects the specified performance properties of the concrete. The mix design statement shall contain all the information as outlines on the concrete mix design statement as shown on the Manitoba Ready Mix Concrete Association website([www.mrmca.com](http://www.mrmca.com)). In addition, the mix design statement must indicate the expected method of placement (buggies, chute, or pump) methods which are to be used. The method of placement must include a clear description of the pumping methods (line, vertical drop, length of hose, etc.).
- (b) The supplier shall submit directly, in confidence, to the City of Winnipeg, the concrete mix design for the concrete type specified herein. The purpose of this confidential submission will be for record keeping purposes only. The concrete mix design shall contain a description of the constituents and the proportions, and at the minimum the following:
  - (i) Cementitious content in kilograms per cubic metre or equivalent units, and type of cementitious materials;
  - (ii) Designated size, or sizes, of aggregates, and the gradation;
  - (iii) Aggregate source location(s);
  - (iv) Weights of aggregates in kilograms per cubic metre or equivalent units. Mass of aggregates is saturated surface dry basis;
  - (v) Maximum allowable water content in kilograms per cubic metre or equivalent units and the water/cementitious ratio;
  - (vi) The limits for slump;
  - (vii) The limits for air content;
  - (viii) Quantity of other admixtures; and
- (c) The concrete mix design statement must be received by the Contract Administrator a minimum of ten (10) Business Days prior to the scheduled commencement of concrete placement. The concrete mix design must be received by the City of Winnipeg a minimum of five (5) Business Days prior to the scheduled commencement of concrete placement.
- (d) Any change in the constituent materials of any approved mix design shall require submission of a new concrete mix design statement, mix design, and mix design test data. If, during the progress of the Work, the concrete supplied is found to be unsatisfactory for any reason, including poor workability, the Contract Administrator may require the Contractor to make any necessary adjustments and associated resubmissions

E6.2.4 Testing and Approval

- (a) All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the 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 accepted by the Contract Administrator at least five (5) 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 material shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.

#### E6.2.5 Concrete Repair Material and Reinforced Concrete Slab

- (a) The Contractor shall be responsible for the design and performance of all concrete mixes supplied under this specification. Either ready mix concrete or proprietary repair mortars may be used having the following minimum properties to meet a Class C-1 exposure in accordance with CSA A23.1-19:
  - (i) Compressive Strength @ 28 days = 35 MPa;
  - (ii) Water / Cementing Materials Ratio = 0.4;
  - (iii) Air Content: Category 1 per Table 4 of CSA A23.1-19.
- (b) Mix design for ready-mix concrete shall be submitted to Contract Administrator at least two weeks prior to concrete placing operations.
- (c) Any proposed proprietary repair mortar shall be subject to the approval of the Contract Administrator.
- (d) The temperature of all types of concrete shall be between 10°C and 25°C at discharge. Temperature requirement for mass concrete and concrete containing silica fume shall be between 10° and 18°C at discharge.
- (e) The concrete slump of all types of concrete shall be 100mm +/- 20mm.
- (f) Synthetic fibres shall not be added to any type of concrete.
- (g) The volumetric resistivity of the concrete shall be maintained based on the anode's supplier requirement. Two concrete cylinders shall be cast from first batch of concrete pour for the volumetric resistivity test by the Contractor.

#### E6.2.6 Aggregates

- (a) The Contractor shall be responsible for testing the fine and coarse aggregates to establish conformance to these specifications, and the results of these tests shall be provided to the Contract Administrator if requested. All aggregates shall comply with CSA A23.1
- (b) Coarse Aggregate
  - (i) The maximum nominal size of coarse aggregate may be 10 to 14 mm for concrete repairs and 20 mm for reinforced concrete slab to suit the Contractor's mix design. Gradation shall be in accordance with CSA A23.1, Table 11, Group 1. The coarse aggregate shall satisfy the Standard Requirements specified in CSA A23.1, Table 12, "Concrete exposed to freezing and thawing".
  - (ii) Coarse aggregate shall consist of crushed stone or gravel or a combination thereof, having hard, strong, durable particles free from elongation, dust, shale, earth, vegetable matter or other injurious substances. Coarse aggregate shall be clean and free from alkali, organic or other deleterious matter; and shall have an absorption not exceeding 2.25%.
  - (iii) The aggregate retained on the 5 mm sieve shall consist of clean hard, tough, durable, angular particles with a rough surface texture, and shall be free from organic material, adherent coatings of clay, clay balls, an excess of thin particles or any other extraneous material.
  - (iv) Coarse aggregate when tested for abrasion in accordance with ASTM C131 shall not have a loss greater than 30%.
- (c) Fine Aggregate
  - (i) Fine aggregate shall meet the grading requirements of CSA A23.1, Table 10, Gradation FA1.
  - (ii) Fine aggregate shall consist of sand, stone, screenings, other inert materials with similar characteristics or a combination thereof, having clean hard, strong, durable, uncoated grains free from injurious amounts of dust, lumps, shale, alkali, organic matter, loam, or other deleterious substances.



- (iii) Tests of the fine aggregate shall not exceed the limits for standard requirements prescribed in CSA A23.1, Table 12.

#### E6.2.7 Formwork

- (a) Formwork materials shall conform to CSA Standard A23.1-04, and American Concrete Publication SP4, "Formwork for Concrete."
- (b) Boards used for formwork shall be fully seasoned and free from defects such as knots, warps, cracks, etc., which may mark the concrete surface.
- (c) 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.
- (d) All formwork fastener holes drilled in to existing concrete must be filled with epoxy grout before casting concrete.

#### E6.2.8 Cementing Materials

- (a) Cementing materials shall conform to the requirements of CSA A3001.
- (b) Silica Fume
  - (i) Should the Contractor choose to include silica fume in the concrete mix design, it shall not exceed 8% by mass of cement
- (c) Fly Ash
  - (i) Fly ash shall be Type CI or Type F and shall not exceed 25% by mass of cement.
- (d) Cementitious materials shall be stored in a suitable weather-tight building that shall protect these materials from dampness and other destructive agents. Cementitious materials that have been stored for a length of time resulting in the hardening or formation of lumps shall not be used in the Work.

#### E6.2.9 Admixtures

- (a) Air entraining admixtures shall conform to the requirements of ASTM C260.
- (b) Chemical admixtures shall conform to the requirements of ASTM C494 or C1017 for flowing concrete.
- (c) All admixtures shall be compatible with all other constituents. The addition of calcium chloride, accelerators, and air-reducing agents will not be permitted.
- (d) Appropriate low range water reducing and/or super plasticizing admixtures shall be used in concrete containing silica fume. Approved retarders or set controlling admixtures may be used for concrete containing silica fume.

#### E6.2.10 Water

- (a) Water to be used for mixing and curing concrete or grout and saturating substrate shall conform to the requirements of CSA A23.1 and shall be free of oil, alkali, acidic, organic materials or deleterious substances.

#### E6.2.11 Concrete Supply

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

E6.2.12 Epoxy Adhesive

- (a) Epoxy adhesive for concrete to steel bonding shall be one of the following approved products: Sternson ST432 or ST433, Dural Duralbond, Capper Capbond E, Sikadur 32 Hi-bond, Concessive 1001 LPL, Meadows Rezi-Weld 1000, or equal as accepted by the Contract Administrator, in accordance with B7.

E6.2.13 Reinforcing Steel

- (a) All reinforcing steel and tie bars for the reinforced concrete slab shall conform to CSA G30.18M, Grade 400W, -in unless otherwise specified.
- (b) Reinforcing steel shall be deemed to include all reinforcing bars and tie-bars.
- (c) If, in the opinion of the Contract Administrator, and reinforcing steel provided for the concrete Works exhibits flaws in manufacture or fabrication, such material shall be immediately removed from the Site and replace with acceptable reinforcing steel. No additional costs will be applied to this Contract for the Replacement of Deficient reinforcing steel.
- (d) All reinforcing steel shall be straight and free from paint, oil, millscale, injurious defects. Rust, surface seams, or surface irregularities will not be cause for rejection provided that the minimum dimensions, cross-sectional area, and tensile properties of a hand wire-brushes specimen are not less than the requirements of CSA standard CAN/CSA G30.18-M92 and ASTM A955M.

E6.3 Equipment

All equipment shall be a type approved by the Contract Administrator and shall be kept in good working order.

E6.4 Construction Methods

E6.4.1 Scope of Work

- (a) Repairing the tunnel interior and exterior surfaces and stairs shall consist of these following types:
  - (i) "Type 1 Repair – Surface (0 to 50 mm)"
  - (ii) "Type 2 Repair – Partial Depth (51 to 100 mm)"
  - (iii) "Type 3 Repair – Partial Depth (101 to 200 mm)"
  - (iv) "Reinforced Concrete Slab"

E6.4.2 Concrete Removal and Surface Preparation

- (a) The Contract Administrator will mark out areas on the interior underpass walls, ceiling exterior entrance walls, and stairs requiring concrete repairs.
- (b) Concrete repairs for the exterior curb walls shall extend 300 mm below the existing sidewalk grade.
- (c) For Type 1 repairs in the underpass ceiling, the use of non-shrink non-metallic grout shall be used.
- (d) For Type 2 and 3 repairs, the deteriorated concrete around reinforcing shall be removed using a chipping hammer no heavier than 20 pounds as to not damage the reinforcing steel.
- (e) Concrete is to be removed a minimum of 25 mm to the depth of deterioration. If reinforcing is not exposed this will be considered a Type 1 Repair (0 to 50 mm). If the removals exceed 50 mm, however and less than half the bar diameter is exposed, concrete shall be removed up to half the bar diameter. This will be considered Type 2 Repair – Partial Depth (51 to 100 mm). The resultant surface is to be rough with a minimum amplitude of 6 mm a maximum frequency of 15 mm.
- (f) Limits of the repair area are to be saw cut 20 mm deep to provide a well-defined interface and bonding surface with the existing sound concrete.

- (g) All reinforcing steel and prepared surfaces shall be sandblasted. Surface preparation type shall be SP-6.

#### E6.4.3 Mixing and Placing Concrete

- (a) The Contract Administrator must be notified at least twenty-four (24) hours prior to placing concrete so that an adequate inspection may be made of the prepared concrete substrate surface and related works. Placement without required prior notification will not be allowed.
- (b) Equipment for mixing or conveying the concrete shall be thoroughly flushed with clean water prior to commencement of the repair operation. All equipment processes are subject to acceptance by the Contract Administrator.

#### E6.4.4 Placing and Finishing Concrete Surfaces for Concrete Reinforced Slab

- (a) Layout
  - (i) The Contractor shall verify the limits of the concrete reinforced slab as indicated on the drawings to maintain a maximum 2% slope away from the stairwell entrances. The surface elevation between the top stair landing and reinforcing slab shall be constant. Any deviations to the drawings shall be notified and accepted by the Contract Administrator.
- (b) Finishing Operations for Unformed Surfaces
  - (i) The Contractor shall ensure that sufficient personnel are provided for the finishing of the reinforced concrete slab.
- (c) All unformed concrete surfaces shall be finished as outline hereinafter.
- (d) Screeding of all unformed concrete surfaces shall be performed by the sawing movement of a straightedge along wood or metal strips or form edges that have been accurately set at required elevations.
- (e) Exposed concrete surfaces shall be given a transverse broomed finish using a coarse broom to produce regular corrugations to a maximum depth of 2 mm. An edging tool shall be used at all edges. Edges of reinforced concrete slab surfaces shall be given a smooth float surface using a magnesium float.

#### E6.4.5 Concrete Temperature

- (a) The temperature of concrete as placed shall be as low as practicable and in no case greater than 27°C.

#### E6.4.6 Curing

- (a) All patches shall be cured for a minimum of three (3) days unless otherwise approved by the Contract Administrator.
- (b) The reinforced concrete slab and concrete repairs "Type 2" and "Type 3" shall be cured a period of seven (7) days. Freshly finished concrete shall have curing compound applied to the exposed concrete surface immediately following finishing operations for at least seven (7) consecutive days thereafter.

#### E6.4.7 Hot Weather Concreting

- (a) General
  - (i) The requirements of this section shall be applied during hot weather, i.e., air temperatures forecast to go higher than 27°C during placing.
  - (ii) Concrete at discharge shall be at as low a temperature as possible, preferably as low as 15°C, but not above 25°C. Concrete containing silica fume shall be between 10°C minimum and 18°C maximum at discharge. Aggregate stockpiles should be cooled by water sprays and sun shades.
  - (iii) The Contractor shall use cold water and/or ice in the mix to keep the temperature of the fresh concrete down, if required. Ice may be substituted for a portion of the mixing water; provided it has melted by the time mixing is completed.

- (iv) Form and conveying equipment shall be kept as cool as possible before concreting by shading them from the sun, painting their surfaces white and/or the use of water sprays.
  - (v) Sun shades and wind breaks shall be used as required during placing and finishing.
  - (vi) Work shall be planned so that concrete can be placed as quickly as possible to avoid "cold joints".
  - (vii) The Contract Administrator's acceptance is necessary before the Contractor may use admixtures such as retardants to delay setting, or water reducing agents to maintain Workability and strength, and these must appear in the Mix Design Statement submitted to the Contract Administrator.
  - (viii) Hot weather curing shall follow immediately after the finishing operation.
- (b) Hot-Weather Curing
- (i) When the air temperature is at or above 25°C, curing shall be accomplished by fog misting and by using saturated absorptive fabric, in order to achieve cooling by evaporation.
- (c) Job Preparation
- (i) When the air temperature is forecast to rise to 25°C or higher during the placing period, provisions shall be made by the Contractor for protection of the concrete in place from the effects of hot and/or drying weather conditions. Under severe drying conditions, the formwork, reinforcement, and concreting equipment shall be protected from the direct rays of the sun or cooled by mist fogging and evaporation, to the satisfaction of the Contract Administrator.

## E6.5 Quality Control

- E6.5.1 All workmanship and materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator, including all operations from the selection and production of materials through to final acceptance of the specified Work. The Contractor shall be wholly responsible for the control of all operations incidental hereto notwithstanding any inspection or acceptance 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.
- E6.5.2 The Contractor shall be responsible for all concrete testing, including but not limited to making test cylinders, transporting cylinders to an independent certified testing laboratory of his choice, storage, curing, breaking, and providing written reports of the concrete test results to the Contract Administrator. The quality control testing shall meet the minimum testing requirement for the specified frequency and test procedure as described in Table 1. All testing shall be completed by qualified personnel who are certified at the time of testing as ACI CASA-Based Concrete Field-Testing Technician – Grade 1 and shall be conducted at the point of discharge into the forms.
- E6.5.3 If Ready Mix Concrete is being used, and loads are frequently being rejected, or strength results are not to specifications, the Contract Administrator, on 24-hour notice, may refuse permission for further use of the Ready-Mix Supplier.
- E6.5.4 Concrete
- (a) Compressive Strength Tests
    - (i) A "Strength Test" shall consist of the compression tests of four standard test specimens, sampled, made, cured, and tested in accordance with CSA Standard Specifications as referenced with modifications as indicated. One cylinder shall be tested at seven days. One cylinder shall be tested at fourteen days. The 28-day test result shall be the average of the strengths of the remaining two specimens. Additional cylinders may be cast, at the discretion of the Contract Administrator or Contractor.
  - (b) Sampling

- (i) Sampling of concrete shall be carried out in accordance with CSA A23.2-1C.
- (c) Test Cylinders
  - (i) Making and curing concrete test cylinders shall be carried out in accordance with CSA A23.2-3C, except that the time for cylinders to reach the testing laboratory shall be between 20 and 48 hours. The test cylinders shall be cast by the Contractor in standard CSA approved moulds. The Contractor shall provide properly designed temperature-controlled storage boxes for test cylinders, as specified in Section 7.3.2.1 of CSA A23.2-3C, for a period of at least 24 hours, and further protection from adverse weather and mishandling until removed from the site. The Contractor shall provide a max-min thermometer for each storage box and record site curing temperatures for all test cylinders. Storage in a site office trailer that is used by the Contractor's personnel during the first 24-hour storage period will not be permitted. Storage facilities shall be provided, installed, and approved by the Contract Administrator before any concrete is placed.
  - (ii) The Contractor shall deliver the test cylinders to an independent CSA certified testing laboratory. Handling and transporting of the cylinders shall be in accordance with CSA 23.2-3C. No extra laboratory curing time will be allowed for cylinders that are delivered late to the laboratory. A copy of the test results shall be forwarded to the Contract Administrator within 2 days of the break date.
  - (iii) Test cylinders will be tested in compression in accordance with CSA-A23.2-9C.
  - (iv) If the test cylinders were allowed to freeze or were otherwise mishandled resulting in unreliable strength test results, the Contract Administrator may reject the affected portions of the Work, unless core-testing, at the Contractor's expense, confirms the in-situ strength of the concrete.
- (d) Slump
  - (i) Slump tests shall be completed in accordance with CSA A23.2-5C.
- (e) Air Content
  - (i) Air content test shall be completed in accordance with CSA A23.2-4C.
- (f) Failure to Meet Slump or Air Content Specifications
  - (i) In the event that slump and/or air content are outside the specified tolerance range, as determined by the Contractor's or the Contract Administrator's testing, the Contract Administrator may accept adjustments of the deficient condition as an alternate to rejection provided adjustments are made within the maximum time allowed as specified. Concrete that does not meet the specifications will be rejected after the maximum time is exceeded.

#### E6.5.5

##### Quality Assurance

- (a) Quality assurance testing may be carried out by the Contract Administrator and the costs for breaking and provision of concrete test cylinder reports will be paid for by the City.
- (b) The Contract Administrator shall be afforded full facilities for the random quality assurance inspection and testing that may be carried on to the concrete itself and/or the constituent materials. This includes at the worksite and any plant used for the manufacture of concrete. The facilities shall be adequate in the opinion of the Contract Administrator to permit proper sampling of but not limited to, making of test cylinders and testing slump and air content. The proper storage of all site cast concrete cylinders in accordance with the relevant specifications is the responsibility of the Contractor and shall be provided prior to any concrete pour.
- (c) The results of the quality assurance testing carried out by the Contract Administrator will serve to monitor and review the quality control program of the Contractor.
- (d) Additional tests will be required if the results are borderline or widely variable. In case of an unacceptable result, one check test will be permitted.

- (e) All materials supplied by the Contractor to be permanently incorporated in the structure are subject to testing by the Contract Administrator and subject to the Contract Administrator's approval prior to their use in construction. Concrete cylinders, slump tests and all other field tests considered necessary shall be made by the Contract Administrator. The Contractor shall assist the Contract Administrator in the performance of these tests as often during the processes of mixing and depositing concrete as the Contract Administrator shall direct. The Contractor shall be responsible for removing and replacing all defective concrete at his own expense.
- (f) There shall be no charge to the City for materials taken by the Contract Administrator for testing purposes.

**E6.6 Measurement and Payment**

- (a) The concrete repairs will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Concrete Repairs and Reinforced Concrete Slab". The area to be paid for will be the total number of square metres of concrete surface repairs, and reinforced concrete slab installed in accordance with the specification, classified as either:
  - (i) "Type 1 Repair – Surface (0 to 50 mm)";
  - (ii) "Type 2 Repair - Partial Depth (51 to 100 mm)";
  - (iii) "Type 3 Repair – Partial Depth (101 to 200 mm)";
  - (iv) "Reinforced Concrete Slab"

as accepted and measured by the Contract Administrator. Measurements shall be made in square millimetres and the total shall be rounded to the nearest hundredth of a square meter.

- E6.6.1 No cost will be associated for the reinforcing steel and tie-in bar supply, placement, and tie-in bar installation for "Reinforced Concrete Slab". It will be included and will be paid for under "Reinforced Concrete Slab" and no additional measurement and payment will be made.

TEST	STANDARD REFERENCE	MANITOBA STANDARD	MINIMUM FREQUENCY
<b>Ready-Mix Concrete</b>			
Sampling	CSA A23.1-1C		One complete test and set of cylinders for compressive strength testing for one out of every 8 m <sup>3</sup> of concrete placed including temperature air content and slump
Temperature	ASTM C 1064		
Compressive Strength	CSA A23.1-3C CSA A23.1-9C	MRB-C405	
Air Content by Pressure Method	CSA A23.1-4C	MRB-C403	
Slump	CSA A23.1-5C	MRB-C402	
Rapid Chloride Permeability	ASTM C1202	<1500 Coulomb @ 28 Days	Two concrete cylinders for each test shall be cast from the first batch of concrete pour
Air Void Parameters	ASTM C457	5-8% @ 28 Days	
Volumetric Resistivity Test	ASTM D256	Shall match with anodes supplier requirement	

**E7. EMBEDDED GALVANIC ANODES**

**E7.1 Description**

- (a) This Section shall cover the installation for embedded galvanic anodes for corrosion mitigation of concrete deck surface repairs and for mitigation in technically sound deck concrete.
- (b) The Work to be done by the Contractor under this Section shall include the furnishing of all superintendence, overhead, labour, material, 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/ICRI 1999 Concrete Repair Manual
- (b) ACI Guideline No. 222 – Corrosion of Metals in Concrete
- (c) CAN/CSA A23.1 Standard for Repair Mortars, Concrete and Bonding Agents
- (d) CAN/CSA G30.18-M92 (R1998) Billet-Steel Bar for Concrete Reinforcement
- (e) ASTM B418-95a Standard Specification for Cast and Wrought Galvanic Zinc Anodes
- (f) G30.3-M1983 (R1998) Cold-Drawn Steel Wire for Concrete Reinforcement

## E7.3 Embedded Anodes for Concrete Partial and Full Depth Repair

### E7.3.1 Materials

- (a) Embedded galvanic anodes shall be Galvashield® XPT by Vector Corrosion Technologies (204) 489-6300 or approved equal. All anodes shall compliance with ASTM B418 and the galvanic anodes shall be alkali-activated and shall not be contained intentionally added chloride. Anodes shall be supplied by the Contractor.
- (b) Low resistivity bed grout shall be Portland cement-based material with suitable electrical conductivity, supplied by the Contractor. Non-conductive repair materials such as epoxy, urethane, or magnesium phosphate shall not be permitted.
- (c) Deliver, store, and handle all materials in accordance with the manufacturer's instructions.

### E7.3.2 Construction Methods

- (a) Cleaning and Repair of Reinforcing Steel
  - (i) Clean exposed reinforcing steel of rust, mortar, etc. to provide sufficient electrical connection and mechanical bond. If significant reduction in the cross section of the reinforcing steel has occurred, replace or install supplemental reinforcing as directed by the Contract Administrator.
  - (ii) Secure loose reinforcing steel by tying tightly to other bars with steel wire.
- (b) Galvanic Anode Installation
  - (i) The Contract Administrator will determine the location of all anodes. Galvanic anodes shall be installed around the perimeter of the repair area with an approximate spacing of 500 mm. Each repair area with exposed reinforcing shall have a minimum of one (1) anode. In no case shall the distance between anodes exceed 600 mm.
  - (ii) Provide sufficient clearance between the anode and concrete substrate to allow repair material (Concrete) to encase the anodes.
  - (iii) Secure the galvanic anodes as close as possible to the patch edge using the anode tie wires. The tie wires shall be wrapped around the cleaned reinforcing steel and twisted tight to allow little or no free movement.
  - (iv) If the anode is to be tied onto a single bar, or if less than 50 mm of concrete cover is expected, place anode beside or beneath the bar and secure to clean reinforcing steel. In locations marked for Type 2 Repair or Type 3 Repair (Partial Depth), where the reinforcing steel bars are not fully exposed, ensure additional concrete is removed around the bars only where anodes are to be installed, i.e. ensure that the bar is exposed enough so tie wires can be wrapped around it twisted tight to allow little or no free movement.
  - (v) If sufficient concrete cover exists, the anode may be placed at the intersection between two bars and secured to each clean bar.
  - (vi) Set the anode in a bed of low resistivity grout if the concrete to be used is determined by the anode supplier to have too high an electrical resistance.
- (c) Electrical Continuity
  - (i) Confirm electrical connection between anode tie wire and reinforcing steel by measuring DC resistance (ohm,  $\Omega$ ) with a multi-meter.

- (ii) Confirm electrical continuity of the exposed reinforcing steel within the repair area. If necessary, electrical continuity shall be established with steel tie wire.
- (iii) Electrical continuity is acceptable if the DC resistance measure with the multi-meter is less than 1 ohm ( $\Omega$ ).

(d) Concrete Replacement

- (i) Following normal concrete repair procedures, complete the repair, taking care not to create voids within the repair.

(e) Clean Up

- (i) The Contractor shall maintain the Sites of Work in a tidy condition and free from the accumulation of waste and debris.

E7.4 Measurement and Payment

E7.4.1 Corrosion Mitigation Anodes

- (a) The supply and installation of corrosion mitigation anodes will be measured on a unit basis and paid for at the Contract Unit Price per Each anode for "Embedded Galvanic Anodes – Corrosion Mitigation Anodes Supply and Installation". The number to be paid for will be the total number of anodes installed in accordance with the specification, accepted and measured by the Contract Administrator.

**E8. SURFACE PREPARATION, TILE REMOVAL, SURFACE PAINTING, CONSTRUCTION JOINT SEAL REPAIR**

E8.1 Description

- (a) This specification shall cover all operations relating to pedestrian interior tunnel preparation, 51 mm x 51 mm tile and grout removal, and interior and exterior tunnel surface painting and construction joint seal replacement.
- (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 work as hereinafter specified.

E8.2 Scope of Work

- (a) 51 mm x 51 mm tile and grout shall be removed to the concrete substrate along the south and north stairwell entrances and in the pedestrian tunnel as indicated on the drawings. All stairwell bedding grout shall be removed down to sound concrete substrate, resulting in a uniform smooth surface prior to sandblasting.
- (b) Surface cleaning (sandblasting) to the concrete substrate (grout removal) where the 51 mm x 51 mm tiles were removed.
- (c) Surface cleaning (sandblasting) of existing 127 mm x 295 mm structural tiles within the tunnel wall surfaces.
- (d) All defects/voids greater than 25 mm x 25 mm, including point repairs, to the damaged 127 mm x 295 mm tiles shall be repaired as directed by the Contract Administrator with non-shrink non-cementitious grout indicated in E6.2.2. This work shall be incidental to the work specified in this specification.
- (e) Surface cleaning (sandblasting) of existing pedestrian tunnel roof surface and north and south tunnel entrances.
- (f) Place prime coat and two coats of paint on all stairwell and pedestrian wall, and exterior curb, and roof surfaces.
- (g) Place two coats of contrast paint 0.3 m from bottom of the wall surfaces and along the interior stairwell walls at both north and south stairwell entrance surfaces.
- (h) Place two coats of paint on all exterior curb wall surfaces at stairwell entrances.
- (i) Repair and replace construction joint seal as specified on the drawings.



### E8.3 Materials

- (a) All materials supplied under this Specification shall be 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.

#### E8.3.1 Materials for Prime Coat and Paint

- (a) Prime coat product shall be "MARCOPOXY 646" FAST CURE EXPOXY by Sherwin Williams or equivalent as approved by the Contract Administrator, in accordance with B7.
- (b) Acrylic Paint colour and product for walls in general and ceiling shall be "Assiniboine Beige" and the product shall be "WEATHERGUARD EXTERIOR MATT N1530" by DULUX or equivalent as approved by the Contract Administrator, in accordance with B7.
- (c) Acrylic Paint colour and product for the bottom 0.3 m wall and stairwell surfaces product shall be "Standard Brown" and the product shall be "WEATHERGUARD EXTERIOR MATT N1530" by DULUX or equivalent as approved by the Contract Administrator, in accordance with B7.
- (d) Acrylic Paint colour and product for outside curb wall at stairwell surfaces product shall be "Assiniboine Beige" and the product shall be "WEATHERGUARD EXTERIOR MATT N1530" by DULUX or equivalent as approved by the Contract Administrator, in accordance with B7.

#### E8.3.2 Material for Construction Joint Seal

- (a) Construction Joint Seal shall be a BEJS System by EMSEAL with width suitable for existing joint gap, or equivalent as approved by the Contract Administrator, in accordance with B7.

### E8.4 Construction Methods

#### E8.4.1 Standard of Acceptance

- (a) Walls: No defects visible from a distance of 1000 mm at 90 degrees to surface when view a using final lighting source.
- (b) Ceiling: No defects visible from floor at 45 degrees to surface when view a using final lighting source.
- (c) Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

#### E8.4.2 Delivery, Storage and Handling

- (a) Deliver and store materials in original containers, sealed with labels intact.
- (b) Indicate on containers or wrappings:
  - (i) Manufacturer's name and address.
  - (ii) Type of paint.
  - (iii) Compliance with applicable standard.
  - (iv) Colour number in accordance with colour schedule provided by Contract Administrator.
- (c) Observe manufacturer's recommendations for storage and handling.

#### E8.4.3 Environmental Requirements

- (a) Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

- (b) Ventilation: ventilate area of work by use of approved portable supply and exhaust fans.
- (c) Provide temporary heating where permanent facilities are not available to maintain minimum recommended temperatures.
- (d) Apply paint finish only in areas where dust is no longer being generated by related construction operations such that airborne particles will not affect the quality of the finished surface.
- (e) Apply paint only when surface to be painted is dry, properly cured, and adequately prepared.

E8.4.4 Extra Materials

- (a) Submit one 4-litre can of each type and colour of primer and finish coating. Identify colour and paint type in relation to established colour and finish formula.
- (b) Deliver to The City and store where directed.

E8.4.5 Protection

- (a) Cover or mask floors, walls, and equipment adjacent to areas being painted to prevent damage and to protect from paint drops and splatters. Use non-staining coverings.
- (b) Protect items that are permanently attached such as Fire Labels on doors, frames, and name plates on equipment.
- (c) Protect factory finished products and equipment.
- (d) Protect the sewer system from sandblasting operations and all debris.

E8.4.6 Tile Removal

- (a) The removal of 51 mm x 51 mm tile and grout along the south and north stairwell entrances shall be removed in a manner that will not damage the existing concrete underneath.

E8.4.7 Surface Preparation and Cleaning

- (a) Sandblasting on underpass wall, ceiling, stairwell, and exterior curb surfaces for painting shall be a classification of SSPC SP 7.
- (b) The sandblasting and cleaning of the tunnel surfaces shall be done in a safe manner and environmental precautions shall be taken. No material shall enter the existing drainage system.
- (c) After the surfaces have been sandblasted they shall be thoroughly cleaned of all sandblasting abrasive grit and debris, with special attention paid to areas within the pedestrian tunnel where sand and debris collect.
- (d) After all surfaces in the pedestrian tunnel and both north and south stairwells have been sandblasted and cleaned, the Contract Administrator shall be notified to carry out a visual inspection of the pedestrian tunnel. A minimum of two (2) business days' notice shall be provided.
- (e) Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- (f) Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances. Remove traces of blast products from surfaces, pockets and corners to be painted. The Contract Administrator shall confirm if any metal surfaces are to be painted prior to surface preparation and painting.

E8.4.8 Surface Painting

- (a) All surfaces that were sandblasted and cleaned shall have a prime coat and two layers of acrylic paint.

(b) Application

- (i) Apply paint in accordance with manufacturer's application instructions unless specified otherwise.
- (ii) Apply each coat of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- (iii) Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- (iv) Sand and dust between each coat to remove visible defects.
- (v) Finish top, bottom, edges and cut-outs of doors after fitting as specified for door surfaces.

E8.4.9 Mechanical/Electrical Equipment

- (a) Do not paint exposed lights, unless otherwise indicated.
- (b) Paint exposed piping and electrical components. Colour and texture to match adjacent surfaces, except as noted otherwise.
- (c) Touch up scratches and marks on painted finishes and equipment with paint as supplied by manufacturer of equipment.
- (d) Do not paint over nameplates, brass or bronze surfaces or machined surfaces.
- (e) Paint both sides and edges of backboards for electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.
- (f) Shall make safe of any electrical components with exposed wiring.

E8.4.10 Restoration

- (a) Clean and reinstall all hardware items that were removed before undertaken painting operations.
- (b) Remove paint splashing on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvents.

E8.4.11 Construction Joint Seal Repairs

- (a) The Contract Administrator will mark out the areas for construction joint seal repairs.
- (b) Remove original damaged construction joint seal, surrounding debris, and damaged concrete. Concrete repairs shall be completed prior to installation of any new construction joint seal.
- (c) Clean surrounding area.
- (d) Chamfer construction joint edges to 19 mm.
- (e) Place new Construction joint seal as per manufacturer specification and as approved by the Contract Administrator.

E8.5 Measurement and Payment

- (a) Pedestrian Underpass 51 mm x 51 mm Tile and Grout Removal to be paid for under the Contract Unit Price in square metres for "Surface Preparation, Tile Removal, Surface Painting, Construction Joint Seal Repair – Pedestrian Underpass 51 mm x 51 mm Tile and Grout Removal", which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this specification.
- (b) Pedestrian Underpass Wall Surfaces – Sandblast Prime and Paint shall be paid for under the Contract Unit Price in square metres for "Surface Preparation, Tile Removal, Surface Painting, Construction Joint Seal Repair – Pedestrian Underpass Wall Surfaces: Sandblast, Prime and Paint", which prices shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this specification.

- (c) Pedestrian Underpass Ceiling Surfaces – Sandblast Prime and Paint shall be paid for under the Contract Unit Price in square metres for “Surface Preparation, Tile Removal, Surface Painting, Construction Joint Seal Repair – Pedestrian Underpass Ceiling Surfaces: Sandblast, Prime and Paint”, which prices shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this specification.
- (d) Pedestrian Underpass Exterior Surfaces – Sandblast Prime and Paint shall be paid for under the Contract Unit Price in square metres for “Surface Preparation, Tile Removal, Surface Painting, Construction Joint Seal Repair – Pedestrian Underpass Exterior Surfaces: Sandblast, Prime and Paint”, which prices shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this specification.
- (e) Pedestrian Underpass Construction Joint Seal Repairs shall be paid for under the Contract Unit Price in linear metres for “Surface Preparation, Tile Removal, Surface Painting, Construction Joint Repair - Pedestrian Underpass Construction Joint Seal Repairs”, which prices shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the work included in this specification.

## **E9. ALUMINUM PEDESTRIAN GUARDRAIL**

### **E9.1 Description**

- (a) This Specification shall cover all operations relating to the removal of existing steel guardrail and supply and installation of the aluminum pedestrian guardrail as specified herein and as shown on the Drawings.
- (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 other things necessary for and incidental to the satisfactory completion of all Work as hereinafter specified.
- (c) This Specifications shall also cover all operations relating to the removal of any existing Steel pedestrian guardrail as specified herein and as shown on the Drawings.

### **E9.2 Referenced Specifications and Drawings**

- (a) The latest edition and subsequent revisions of the following:
  - (i) ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate;
  - (ii) ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes;
  - (iii) ASTM B276 – Standard Specification for Stainless Steel Bars and Shapes;
  - (iv) ASTM D1187 – Standard Specification for Asphalt-Base Emulsions for use as Protective Coatings and Metal;
  - (v) CAN/CSA W47.2 – Certification of Companies for Fusion Welding of Aluminum;
  - (vi) CAN/CSA W59.2 – Welded Aluminum Construction; and
  - (vii) CAN/CSA S157 – Strength Design in Aluminum.

### **E9.3 Scope of Work**

- (a) The Work under this Specification shall involve:
  - (i) Removal of existing steel guardrail posts and panels and patching existing post locations with non-shrink grout in specification E6.2.2;
  - (ii) Supplying and installing new aluminum rail posts and panels. New guardrail will not be required on the exterior curved north wall;
  - (iii) Supplying and installing miscellaneous steel items and other items associated with the Work;
  - (iv) Installation of temporary guardrail for pedestrian safety.

#### E9.4 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.
- (b) The Contractor shall submit to the Contract Administrator for review and approval, at least twenty (10) Business Days prior to the scheduled commencement of any fabrication, the proposed Shop Drawings showing all fabrication details of the aluminum pedestrian guardrail. Fabrication shall take place as shown on the Drawings.
- (c) The Contractor shall submit to the Contract Administrator for review and approval, at least ten (10) Business Days prior to the scheduled commencement of any fabrication, the operator's qualifications, Quality Control Plan and mill certificates.
- (d) The Contractor shall submit to the Contract Administrator for review and approval, at least twenty (10) Business Days prior to the scheduled commencement of any fabrication, the proposed welding procedures and welding consumable certificates. The Contractor shall submit copies of the welding procedures which he intends to use, for examination and acceptance by the Contract Administrator.
  - (i) The Contractor shall submit copies of the welding procedures which he intends to use, for examination and acceptance by the Contract Administrator.
  - (ii) Such procedures shall be accompanied by documentary proof that they have been qualified previously by the Canadian Welding Bureau at the plant where the Work is to be carried out.
  - (iii) The procedures shall include the following information: joint type, welding process, welding position, base metal specification, welding consumable specification and size, preheat requirements, amperage and voltage requirements, speed, polarity, and welding equipment, including a description of travel for automatic welding.

#### E9.5 Materials

##### E9.5.1 General

- (a) All materials supplied under this Specification shall be of a type acceptable to 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.

##### E9.5.2 Material for Aluminum Pedestrian Guardrail

- (a) Extruded Shapes or Drawn Tubing for Rails and Posts: shall conform to the latest edition and all subsequent revisions of CAN/CSA Aluminum Alloy and Temper HA.5 SG 11 R-T6 (ASTM B221 Alloy 6351-T6), or HA.7 GA 11 M-T6 (ASTM B221 Alloy 6061-T6).
- (b) Aluminum sheet, bar, support pin, angle, and plate shall conform to the latest edition and all subsequent revisions of ASTM B221- Alloy 5083, ASTM B209 Alloy 6061-T6 or Alloy 6351-T6.
- (c) Bolts and cap screws, nylon lock nuts, and washers - stainless steel conforming to ASTM A276, Type 316.

##### E9.5.3 Guardrail Anchorage System

- (a) The guardrail anchorage system shall be 13 mm (1/2") Diameter by 75 mm (3") long HILTI HAS-R 316 SS anchor rod with HIT-1 injectable epoxy adhesive or equivalent as accepted by the Contract Administrator, in accordance with B7.

##### E9.5.4 Aluminum Shims

- (a) Aluminum shims shall conform to ASTM Standard B221, Alloy 6061-T6, and shall be supplied as required to facilitate the installation of the rail posts as shown on the

Drawings. Supply of shims will be considered incidental to the supply of aluminum pedestrian handrail.

E9.5.5 Aluminum Filler Alloys for Welded Construction

- (a) Aluminum filler alloys for welded construction shall be one of the following: ER4043, ER5183, ER5356, ER5554, ER5556, or ER5654.

E9.6 Equipment

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

E9.7 Fabrication

(a) General

- (i) Before fabrication of the aluminum pedestrian guardrail the anchor locations and installation must be verified and completed to avoid conflict with the existing reinforcing.
- (ii) Before fabrication and/or installation of the aluminum pedestrian guardrail, the Contractor shall satisfy himself of all required of the aluminum pedestrian guardrail and enclosure section dimensions and guardrail posts/hardware to not interfere with existing guardrail post locations or existing reinforcing material, by field measurements. It has been noted that the existing curb walls are graded down towards the tunnel according to the drawings. The guardrail drawings have not accommodated this, and revisions by the Contractor may be deemed required.
- (iii) No fabrication shall commence until permission to do so has been received from the Contract Administrator.
- (iv) All fabrication shall be carried out in accordance with this Specification and the Drawings.
- (v) The Fabricator shall fabricate the new components of the aluminum pedestrian handrail/bicycle rail in sections, to permit the installation of the rail sections onto the concrete.
- (vi) The punching of identification marks on the members will not be allowed.
- (vii) Any damage to members during fabrication shall be drawn to the attention of the Contract Administrator in order that the Contract Administrator may accept remedial measures.
- (viii) Dimensions and fabrication details which control the field matching of parts shall receive very careful attention to avoid field adjustment.
- (ix) Components of the railings and enclosures shall be joined by means of bolt, cap screws, and welds as called for on the Drawings.

(b) Sample Panel

- (i) The Contractor shall be required to supply one completely fabricated guardrail sample panel, including at least two new posts prior to proceeding with the fabrication of the remainder. The sample, once accepted, shall be identifiable for the duration of the Project, but may be incorporated into the rail system. It shall become the standard for acceptance of all aluminum pedestrian handrail panels.

(c) Cutting

- (i) Material 13 mm thick or less may be sheared, sawn, or cut with a router. Materials more than 13 mm thick shall be sawn or routed. Cut edges shall be true and smooth and free from excessive burrs or ragged breaks. Re-entrant cuts shall be avoided whenever possible. If used, they shall be filleted by drilling prior to cutting. Flame cutting of aluminum alloys is not permitted.

(d) Welding

- (i) Welded construction shall conform to the requirements of the latest edition and all subsequent revisions of CAN/CSA W59.2, Welded Aluminum Construction and W47.2, Certification of Companies for Fusion Welding of Aluminum.

- (ii) Welding will be done by qualified welders using the Metal Inert Gas (MIG) process. All areas to be welded should be thoroughly cleaned with a suitable solvent followed by wire brushing if surfaces are heavily oxidized. The size of fillet for equal leg fillet welds is defined as the leg length of the largest isosceles right-angle triangle which can be inscribed within the fillet weld section. Welds must penetrate into the root corner. All butt welds should have full penetration to ensure maximum strength. Defective welds should be repaired by chipping out the defective area and rewelding. Particular care must be paid to the elimination of craters and cold starts.
  - (iii) Welders and procedure should be qualified as agreed between the Contract Administrator and the Fabricator. The minimum requirements for mechanical test results of joints butt welded with Alcan 56S filler alloy shall be 259 MPa for Alcan D45S-H1 1A and 165 MPa for Alcan B51S-T4 alloy. In addition to the mechanical tests, soundness tests should be made as follows:
    - (i) Guided Bend Test: All bend tests should be fully guided through an angle of 180°. Root, face, and side bend tests in Alcan D54S parent alloy welded in Alcan 56S filler wire require a bend radius of 2T where T is the thickness of the material. For Alcan B51S parent alloy welded with 56S filler wire, a bend radius of 4T is required. Root bend and face bend specimens on material 10 mm thick and less should be 305 mm long and a minimum of 25 mm in width and cut from a plate having a minimum butt weld length of 450 mm. No test piece should be taken within 25 mm of the ends of the weld. Side bend tests should be carried out on material over 10 mm in thickness.
    - (ii) Specimens should be 10 mm in width. Longitudinal edges should be given in 2 mm radius. There should be no crack greater than 3 mm in length. If a crack starts from an edge, the specimen should be disregarded.
    - (iii) Fracture Test: The butt-welded joint shall have a notch not exceeding 2 mm in depth sawn on the four sides of the weld bend and the weld broken. Inspection of the fracture should reveal no gas pockets or inclusions greater than 2 mm in diameter and the area lost due to scattered gas, porosity or voids should not exceed 3% of the area under inspection.
- (e) Bolting
- (i) Bolt holes in 10 mm or thinner material may be drilled or punched to finished size. In material thicker than 10 mm, the holes shall be drilled to finished size or sub-punched smaller than the normal diameter of the fastener and reamed to size.
  - (ii) The finished diameter of the holes shall be not more than 7 percent greater than the nominal diameter of the fastener, except:
  - (iii) Slotted holes for expansion purposes shall be provided as required on the Drawings
  - (iv) Holes for anchor bolts may be up to 50 percent greater than the nominal bolt diameter with a maximum of 13 mm greater than the nominal bolt diameter.
  - (v) Holes shall not be drilled in such a manner as to distort the metal, but holes only slightly misaligned may be reamed to render a reasonable fit.
  - (vi) In all bolts, the finished shank shall be long enough to provide full bearing, and washers shall be used under the nuts to give full grip when the nuts are tightened.

#### E9.7.1 Removal of Existing Steel Guardrail

- (a) The Contractor shall cut the existing steel guardrail post 50 mm below the existing concrete surface and patched with non-shrink grout in specification E6.2.2.
- (b) The Contractor shall follow manufacturer specifications when handling, and placement of non-shrink grout.

#### E9.7.2 Installation of Aluminum Guardrail

- (a) The aluminum pedestrian guardrail shall be brought on-site and incidentally installed as shown on the drawings.
- (b) The rails shall be set true to the line and grade as shown on the Drawings or as required by the Contract Administrator.

- (c) The material shall be carefully handled so that no parts will be bent, broken or otherwise damaged. Hammering which will injure or distort the member is not permitted. The Contractor shall report to the Contract Administrator any corrective measures.
- (d) Except where shown on the Drawings, field welding shall not be permitted unless acceptable to the Contract Administrator. The rail posts shall be set on aluminum shims, as required, to achieve the correct elevation and grade. Additional aluminum shims shall be installed as required to achieve the correct elevation and grade. The surface of the bottom shim that is in contact with concrete shall be separated with a neoprene pad. A minimum 3 mm aluminum shim shall be installed under each post.

#### E9.8 Quality Control

- (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 Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspecting 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.
- (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.

#### E9.9 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/her inspector for testing purposes as required. There will be no charge to the City for samples taken.

#### E9.10 Testing

- (a) All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the 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.

#### E9.11 Temporary Pedestrian Guardrail

- (a) The Contractor shall install a temporary non-climbable guard rail system, minimum 1.2 m high, with no openings greater than 100 mm, and acceptable to the Contractor Administrator when the existing guardrail has been removed.

#### E9.12 Measurement and Payment

- (a) Supplying and Installing the stainless steel stair handrail on a unit basis and paid for at the Contract Unit Price per linear metre for "Supply and Install Aluminum Guardrail", measured as specified herein, performed in accordance with this Specification and accepted by the Contract Administrator, which price shall be paid in full for removal of existing guardrail, installing and supplying all materials and for performing all operations herein described and all other items incidental to the Work.

### E10. STAIR HANDRAIL

#### E10.1 Description

- (a) This Specification shall cover all operations relating to all associated works for removal of existing steel handrail and supply and installation of the stainless steel (SS) stair handrail as specified herein and as shown on the Drawings.



- (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 other things necessary for and incidental to the satisfactory completion of all Work as hereinafter specified.
- (c) This Specifications shall also cover all operations relating to the removal of any existing Steel Stair handrail as specified herein and as shown on the Drawings.

#### E10.2 Referenced Specifications and Drawings

- (a) The latest edition and subsequent revisions of the following:
  - (i) ASTM A269/A269M-15A – Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service;
  - (ii) ASTM A276/276M-17 – Standard Specification for Stainless Steel Bars and Shapes;
  - (iii) ASTM A790/A790M-20 – Standard Specification for Stainless Steel Bars and Shapes;
  - (iv) CAN/CSA W59-18 – Welded Steel Construction
  - (v) CAN/CSA W47.1 – Certification of Companies for Fusion Welding of Steel;
  - (vi) National Building Code of Canada 2015, Volume 1; and
  - (vii) The Buildings and Mobile Homes Act - Manitoba Building Code, Regulation 31/2011.

#### E10.3 Scope of Work

- (a) The Work under this Specification shall involve:
  - (i) Removal of existing steel stair handrails and patching existing steel stair handrail voids with non-shrink grout in specification E6.2.2;
  - (ii) Supplying and installing new SS Stair handrail system, posts, and anchor bolt system.

#### E10.4 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.
- (b) The Contractor shall submit to the Contract Administrator for review and approval, at least twenty (10) Business Days prior to the scheduled commencement of any fabrication, the proposed Shop Drawings showing all fabrication details of the stainless-steel pedestrian handrail rail. Fabrication shall take place as shown on the Drawings.
- (c) The Contractor shall submit to the Contract Administrator for review and approval, at least ten (10) Business Days prior to the scheduled commencement of any fabrication, the operator's qualifications, quality control plan, and mill certificates.
- (d) The Contractor shall submit to the Contract Administrator for review and approval, at least twenty (10) Business Days prior to the scheduled commencement of any fabrication, the proposed welding procedures and welding consumable certificates. The Contractor shall submit copies of the welding procedures which he intends to use, for examination and acceptance by the Contract Administrator.
- (e) The Contractor shall submit copies of the welding procedures which he intends to use, for examination and acceptance by the Contract Administrator.
- (f) Such procedures shall be accompanied by documentary proof that they have been qualified previously by the Canadian Welding Bureau at the plant where the Work is to be carried out.
- (g) The procedures shall include the following information: joint type, welding process, welding position, base metal specification, welding consumable specification and size, preheat requirements, amperage and voltage requirements, speed, polarity, and welding equipment, including a description of travel for automatic welding.

#### E10.5 Materials

E10.5.1 General

- (a) All materials supplied under this Specification shall be of a type acceptable to 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.

E10.5.2 Material for the SS Stair Handrail

- (a) All material shall conform to the latest edition and all subsequent revisions of ASTM A269/A269M-15A Grade 316 or approved equivalent to the Contract Administrator, in accordance with B7.
- (b) All base plates material shall conform to ASTM A276/276M-17 Class 316 or approved equivalent to the Contract Administrator, in accordance with B7.

E10.5.3 Stainless Steel for Welded Construction

- (a) Welding: All welding shall conform to the requirements of the current CSA standard W59 and the fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with the requirements of the current CSA Standard W47. Welding shall be done by currently licensed welders only and certified design welds.

E10.5.4 Welding

- (a) Stainless Steel filler alloys for welded construction shall be one of the following: E316L, ER316L, E316TX, EC316L, or 1N316L.

E10.5.5 Handrail Anchorage System

- (a) All base plate anchors shall be 13 mm (1/2") Diameter by 75 mm Long Hilti HAS-R 316 SS, C/W SS Nuts, and SS Lock Washer Anchor Rod with HILTI HIT-1 Adhesive or approved equivalent to the Contract Administrator, in accordance with B7.
- (b) All fasteners and all wall-mounted fasteners and hardware shall be stainless steel ASTM A276 type 304 or approved equivalent to the Contract Administrator, in accordance with B7.

E10.6 Construction Methods

E10.6.1 Layout

- (a) Before fabrication of the SS handrail, the anchor locations and installation must be verified and completed to avoid conflict with the existing reinforcing material.
- (b) Before fabrication and/or installation of the SS handrail, the Contractor shall satisfy himself of all required SS handrail and enclosure section dimensions, by field measurements.

E10.6.2 Workmanship

- (a) Proportion items to meet the National Building Code, the Manitoba Building Code and local conditions specifically relating to wind and snow loading. Items shall support loads recommended by the Code unless specific loads are indicated on the drawings.
- (b) Fabricate all Work to shape and size with sharp lines, angles and smooth surfaces as defined in the drawings. Connections shall be securely welded, bolted or riveted. Welds shall be dressed smooth on exposed surfaces. Rabbets, lugs and brackets shall be provided so that the Work can be assembled in a neat substantial manner. Thickness of metal and design of assembly and support shall give ample strength and stiffness.
- (c) All portions of the Work shall be nearly finished. Exposed ends and edges of metal shall be smooth.
- (d) Insofar as possible, the Work is to be fitted and assembled in the Contractor's shop and delivered to Site in largest practical sections.

- (e) Fabricated Work in strict accordance with shop drawings. Shop drawings are to be based on details, sizes, materials shown on drawings and specified herein.
- (f) Welding: All welding shall conform to the requirements of the current CSA Standard W59 and the fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with the requirements of the current CSA Standard W47. Welding shall be done by currently licensed welders only and certified to design welds.
- (g) Manufacturer shall be a member of the Canadian Welding Bureau, or governing body where manufacture is in another country, and certified to design welds.
- (h) Welding splatter and other fabrication burrs where exposed shall be ground or filed smooth and left ready for subsequent operations.
- (i) Assembly: Material intended for use in the various assemblies shall be straight, clean, sharply designed profiles, assembled in such a way that no disfigurements will show in the finished work, or impair the strength.

#### E10.6.3 Fabrication

- (a) General
  - (i) No fabrication shall commence until permission to do so has been received from the Contract Administrator.
  - (ii) All fabrication shall be carried out in accordance with this Specification and the Drawings.
  - (iii) The Fabricator shall fabricate the new components of the SS Stair handrails in sections, to permit the installation of the rail sections onto the concrete.
  - (iv) The punching of identification marks on the members will not be allowed.
  - (v) Any damage to members during fabrication shall be drawn to the attention of the Contract Administrator in order that the Contract Administrator may accept remedial measures.
  - (vi) Dimensions and fabrication details which control the field matching of parts shall receive very careful attention in order to avoid field adjustment.
  - (vii) All joints and welds shall be ground smooth.
  - (viii) Final surface shall be brushed.
  - (ix) Fasteners used in accessible locations must be tamper proof design.
- (b) Sample Handrail
  - (i) The Contractor shall be required to supply one fabricated handrail component sample prior to proceeding with the fabrication of the remainder. The sample, once accepted, shall be identifiable for the duration of the Project, but may be incorporated into the rail system. It shall become the standard for acceptance of all Stainless-Steel handrail.

#### E10.6.4 Removal of Existing Steel Handrail

- (a) The Contractor shall cut the existing steel handrail to achieve 50 mm cover to the existing concrete surface and fill voids with Non-Shrink Grout Material as specified on the Drawings.
- (b) The Contractor shall follow manufacturer specifications when handling, and placement of non-shrink grout.

#### E10.6.5 Installation of SS Stair Handrail

- (a) The SS stair handrail shall be brought on-site and accurately installed as shown on the Drawings.
- (b) The rails shall be set true to the line and grade as shown on the Drawings or as required by the Contract Administrator.
- (c) The material shall be carefully handled so that no parts will be bent, broken or otherwise damaged. Hammering which will injure or distort the member is not

permitted. The Contractor shall report to the Contract Administrator any corrective measures.

- (d) Except where shown on the Drawings, field welding shall not be permitted unless acceptable to the Contract Administrator.
- (e) Railing mounted to wall shall be installed with mounting plates as shown on the drawings.

#### E10.7 Measurement and Payment

- (a) Supplying and Installing the SS stair handrail on a unit basis and paid for at the Contract Unit Price per metre "Supply and Install SS Stair Handrail – Wall-Mounted Handrail", measured as specified herein, performed in accordance with this Specification and accepted by the Contract Administrator, which price shall be paid in full for removal of existing handrail, installing and supplying all materials and for performing all operations herein described and all other items incidental to the Work.
- (b) Supplying and Installing the SS stair handrail on a unit basis and paid for at the Contract Unit Price per metre for "Supply and Install SS Stair Handrail – Intermediate Handrail", measured as specified herein, performed in accordance with this Specification and accepted by the Contract Administrator, which price shall be paid in full for removal of existing handrail, installing and supplying all materials and for performing all operations herein described and all other items incidental to the Work.

### **E11. DETECTABLE WARNING SURFACE TILES**

#### E11.1 Description

- (a) This Specification shall cover all operations relating to
  - (i) the supply and installation of surface mounted detectable warning surface tiles at the north and south stair landings; and,
  - (ii) The supply and installation of 150 mm strip cast into new concrete sidewalk at the south entrance.

#### E11.2 Reference Specifications and Drawings

- (a) City of Winnipeg - Accessibility Design Standard 3<sup>rd</sup> edition, September 2018.

#### E11.3 Scope of Work

- (a) The work under this Specification shall include the following items, to the limits as show on the Drawings or as otherwise directed by the Contract Administrator.
  - (i) Installation of surface mounted detectable warning tiles at the top of the South and North stair entrances that spans the entire stair landing width as specified by the drawings and accepted by the Contract Administrator.
  - (ii) Installation of 100 mm wide detectable warning tiles cast-in to new concrete sidewalk along the north edge of the south reinforced concrete slab as specified by the drawings and accepted by the Contract Administrator.

#### E11.4 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.

#### E11.5 Materials

##### E11.5.1 General

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

##### E11.5.2 Material for Detectable Warning Tile

- (a) The surface mounted detectable warning tile shall be “yellow” by Evergrip Corduroy Hazard Warning Tactile Paving or equivalent as accepted but the Contract Administrator, in accordance with B7.
- (b) The cast-in-place detectable warning tile shall be “Federal Yellow” Armor-Tile Wayfinding Tile 6” wide strips by Kinesik or equivalent as accepted but the Contract Administrator, in accordance with B7.

#### E11.6 Installation

- (a) Clean and prepare concrete surface to remove dust, dirt and other surface debris by vacuuming or compressed air prior to placing and installing detectable warning surface tiles.
- (b) Surface mounted detectable warning tiles shall be installed in accordance with manufacturer’s specifications or as approved by the Contract Administrator.

#### E11.7 Measurement and Payment

- (a) Surface mounted detectable warning tiles shall be measured on a unit basis and paid for at the Contract Unit Price per square metre for “Detectable Warning Tiles - Surface Mounted”. The number of square metres to be paid for shall be the total units of surface mounted detectable warning tiles supplied and installed in accordance with this Specification, accepted and measured by the Contract Administrator.
- (b) Cast-in-place detectable warning tiles shall be measured on a unit basis and paid for at the Contract Unit Price per unit for “Detectable Warning Tiles – Cast-In-Place”. The number of units to be paid for shall be the total number of cast-in-place detectable warning tiles supplied and installed in accordance with this Specification, accepted and measured by the Contract Administrator.

### **E12. STAIR NOSING AND TREAD REPAIRS AND INSTALLATION**

#### E12.1 Description

- (a) This Specification shall cover all operations relating to the removal of existing damaged stair nosings and treads and supply and installation of new stair nosings and treads.
- (b) The Work to be done under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

#### E12.2 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.

#### E12.3 Materials

##### E12.3.1 General

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

##### E12.3.2 Material for the Stair Nosing and Tread

- (a) The new installation of Stair Nosing and Tread shall be “Nystrom STSB-N3D” by Urban Access Solutions that are mechanically fastened or equivalent as accepted by the Contract Administrator, in accordance with B7.

#### E12.4 Construction Methods

- (a) The Contract Administrator will mark out the areas on the stairs that require stair nosing and tread replacements. Concrete repairs in Specification E6 shall occur at the same time.

- (b) Clean and prepare concrete surface to remove dust, dirt and other surface debris by vacuuming or compressed air prior to placing and installing new stair nosing tread.
- (c) New stair nosing tread shall be flush with existing stairs.
- (d) Installation shall be in accordance with manufacturer's specifications.
- (e) Mechanical fasteners shall be drilled and anchored nosings shall be with SS fasteners.

#### E12.5 Quality Control

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

#### E12.6 Measurement and Payment

- (a) Stair Nosing and Tread and Installation shall be measured on a unit basis and paid for at the Contract Unit Price per unit for "Stair Nosing and Tread Installation". The number of units to be paid for shall be the total number of stair nosings and treads supplied and installed in accordance with this Specification, accepted and measured by the Contract Administrator.

### **E13. QUARTER-DOME ACRYLIC SAFETY MIRRORS**

#### E13.1 Description

- (a) This Specification shall cover all operations relating to the installation of Quarter-Dome Acrylic Safety Mirrors.
- (b) The Work to be done under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

#### E13.2 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.

#### E13.3 Materials

##### E13.3.1 General

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

##### E13.3.2 Material for the Quarter-Dome Acrylic Safety Mirror

- (a) The new installation of the quarter-dome acrylic safety mirrors shall be model "H-4098" by ULINE or equivalent as accepted by the Contract Administrator, in accordance with B7.

#### E13.4 Construction Methods

- (a) Locations are as specified on the Drawings.
- (b) Clean and prepare concrete surface to remove dust, dirt and other surface debris by vacuuming or compressed air prior to placing and installing new quarter-dome acrylic safety mirrors.

#### E13.5 Measurement and Payment

- (a) Safety dome supply and installation shall be measured on a unit basis and paid for at the Contract Unit Price per unit for "Quarter-Dome Acrylic Safety Mirrors". The number of units to be paid for shall be the total number of safety dome mirrors supplied and installed in accordance with this Specification, accepted and measured by the Contract Administrator.

### **E14. MANITOBA HYDRO EXTERIOR LIGHT STANDARDS REMOVAL, REPLACEMENT & INSTALLATION OF ADAPTORS**

#### E14.1 Description

- (a) This Specification shall cover all operations relating to removal of the existing Manitoba Hydro light standards, de-energizing of the bases, supply and installation of the adaptors and hardware, and installation of the new Manitoba Hydro light standards.
- (b) The Work to be done under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

#### E14.2 Referenced Specifications

- (a) The latest edition and subsequent revisions of the following:
  - (i) CAN/CSA W59-18 – Welded Steel Construction
  - (ii) CAN/CSA W47.1 – Certification of Companies for Fusion Welding of Steel;
  - (iii) ASTM A123/A123M-17 – Standard Specification for Zinc (Hot-Dip Galvanized) Coating on Iron and Steel Products
  - (iv) ASTM F1554-18 – Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
  - (v) CISC – Handbook of Steel Construction Eleventh Edition; and
  - (vi) National Building Code of Canada 2015, Volume 1;

#### E14.3 Scope of Work

- (a) The work under this Specification shall include the following items, to the limits as show on the Drawings or as otherwise directed by the Contract Administrator
  - (i) Near the start of construction, Manitoba Hydro shall remove the existing exterior light standards (at the entrance of each stairwell) and de-energize the electrical at the bases (Contractor to coordinate);
  - (ii) Contractor to supply and install the adaptors and hardware for the new Manitoba Hydro decorative acorn light standards. The existing threaded rods can be reused, but the Contractor shall supply new compatible ASTM F1554 nuts and washers for the  $\frac{3}{4}$ " nominal bolt size, to connect the concrete base to the bottom of the adaptor, as shown on the drawings. The Contractor shall supply all new bolts, nuts and washers, as shown on the drawings, to attach the top of the adaptors to the new Manitoba Hydro decorative acorn light standards.
  - (iii) Once complete, Manitoba Hydro will supply and install and connect the new Manitoba Hydro decorative acorn light standards.

#### E14.4 Submittals

- (a) The Contractor shall submit to the Contract Administrator for review and approval, at least twenty (10) Business Days prior to the scheduled commencement of any fabrication, the proposed Shop Drawings showing all fabrication details of the light standard adaptor. Fabrication shall take place as shown on the Drawings.
- (b) The Contractor shall submit to the Contract Administrator for review and approval, at least ten (10) Business Days prior to the scheduled commencement of any fabrication, the operator's qualifications, quality control plan, and mill certificates.

- (c) The Contractor shall submit to the Contract Administrator for review and approval, at least twenty (10) Business Days prior to the scheduled commencement of any fabrication, the proposed welding procedures and welding consumable certificates. The Contractor shall submit copies of the welding procedures which he intends to use, for examination and acceptance by the Contract Administrator.
- (d) The Contractor shall submit copies of the welding procedures which he intends to use, for examination and acceptance by the Contract Administrator.
- (e) Such procedures shall be accompanied by documentary proof that they have been qualified previously by the Canadian Welding Bureau at the plant where the Work is to be carried out.
- (f) The procedures shall include the following information: joint type, welding process, welding position, base metal specification, welding consumable specification and size, preheat requirements, amperage and voltage requirements, speed, polarity, and welding equipment, including a description of travel for automatic welding.

#### E14.5 Materials

##### E14.5.1 General

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

##### E14.5.2 Material for Manitoba Hydro light standard adaptor

- (a) All base plate material shall conform to the latest edition and all subsequent revisions of CSA G40.21 Grade 300W or approved equivalent to the Contract Administrator, in accordance with B7.
- (b) All circular hollow section (HSS 127) material shall conform to the latest edition and all subsequent revisions of CSA G40.21 Grade 350W or approved equivalent to the Contract Administrator, in accordance with B7.

##### E14.5.3 Fasteners

- (a) All base plate to base plate fasteners and all mounting hardware shall be Galvanized ASTM F3125 Grade A325 or approved equivalent to the Contract Administrator, in accordance with B7.
- (b) Fasteners for the existing Anchor Bolts shall be ASTM F1554-18 Grade 55 or approved equivalent to the Contract Administrator, in accordance with B7.

##### E14.5.4 Steel Filler Alloys for Welded Construction

- (a) Steel filler alloys for welded construction shall be in conformance with CSA W59-18, Table 11.1 for the specified Steel CSA G20.21 Grade 300W and 350W.

#### E14.6 Construction Methods

##### E14.6.1 Workmanship

- (a) Proportion items to meet the National Building Code, the Manitoba Building Code and local conditions specifically relating to wind and snow loading. Items shall support loads recommended by the Code unless specific loads are indicated on the drawings.
- (b) Fabricate all Work to shape and size with sharp lines, angles and smooth surfaces as defined in the drawings. Connections shall be securely welded. Welds shall be dressed smooth on exposed surfaces. Rabbets, lugs and brackets shall be provided so that the Work can be assembled in a neat substantial manner. Thickness of metal and design of assembly and support shall give ample strength and stiffness.
- (c) All portions of the Work shall be nearly finished. Exposed ends and edges of metal shall be smooth.
- (d) Insofar as possible, the Work is to be fitted and assembled in the Contractor's shop.



- (e) Fabricated Work in strict accordance with shop drawings. Shop drawings are to be based on details, sizes, materials shown on drawings and specified herein.
- (f) Welding: All welding shall conform to the requirements of the current CSA Standard W59 and the fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with the requirements of the current CSA Standard W47. Welding shall be done by currently licensed welders only and certified to design welds.
- (g) Manufacturer shall be a member of the Canadian Welding Bureau, or governing body where manufacture is in another country, and certified to design welds.
- (h) Welding splatter and other fabrication burrs where exposed shall be ground or filed smooth and left ready for subsequent operations.
- (i) Assembly: Material intended for use in the various assemblies shall be straight, clean, sharply designed profiles, assembled in such a way that no disfigurements will show in the finished work, or impair the strength.

#### E14.6.2 Fabrication

- (a) General
  - (i) No fabrication shall commence until permission to do so has been received from the Contract Administrator.
  - (ii) All fabrication shall be carried out in accordance with this Specification and the Drawings.
  - (iii) Any damage to members during fabrication shall be drawn to the attention of the Contract Administrator in order that the Contract Administrator may accept remedial measures.
  - (iv) Dimensions and fabrication details which control the field matching of parts shall receive very careful attention to avoid field adjustment.
  - (v) All joints and welds shall be ground smooth.
- (b) Hot-Dip Galvanizing
  - (i) All material including fasteners shall be Hot-Dip Galvanized and shall be in accordance with ASTM A123/A123-17 and will meet a minimum net retention of 610 g/m<sup>2</sup>.

#### E14.7 Removal and Installation of Manitoba Hydro Light Standards and Installation of New Adaptors

- (a) The Contractor shall coordinate with Manitoba Hydro, for Manitoba Hydro to remove and de-energize the existing light standards.
- (b) The Contractor shall supply and install the adaptors and associated hardware, that will connect the existing concrete base and anchor bolts to the new Manitoba Hydro decorative acorn light standards.
- (c) The Contractor shall coordinate with Manitoba Hydro, for Manitoba Hydro to supply, install, and re-energize the new Manitoba Hydro decorative acorn light standards.
- (d) The Contractor shall reuse the existing hardware connected to the existing concrete base, except the existing nuts and washers, to connect to the base of the new adaptors. The existing threaded rods can be reused, but the Contractor shall supply new compatible ASTM F1554 nuts and washers for the 3/4" nominal bolt size, to connect the concrete base to the bottom of the adaptor, as shown on the drawings. The Contractor shall supply all new bolts, nuts and washers, as shown on the drawings, to attach the top of the adaptors to the new Manitoba Hydro decorative acorn light standards.
- (e) The Contractor shall protect the hardware and concrete bases from damage during removal and installation of the existing and new Manitoba Hydro light standards and adaptors.

#### E14.8 Measurement and Payment

- (a) The Manitoba Hydro light standard adaptor supply and installation shall be measured on a unit basis and paid for at the Contract Unit Price per unit for "Supply and Install Manitoba Hydro Decorative Acorn Light Standard Adaptor". The number of units to be paid for shall be the total number of adaptors supplied and installed in accordance with this Specification, accepted and measured by the Contract Administrator.