



THE CITY OF WINNIPEG

TENDER

TENDER NO. 987-2022

MINOR REHABILITATION OF ST. JAMES BRIDGES

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 MINOR REHABILITATION OF ST. JAMES BRIDGES

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, April 7th, 2023.

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.

B3.2 The Bidder is responsible for inspecting the Site the nature of the Work to be done and all conditions that might affect their Bid or their performance of the Work, and shall assume all risk for conditions existing or arising in the course of the Work which have been or could have been determined through such an inspection.

B4. ENQUIRIES

B4.1 All enquiries shall be directed to the Contract Administrator identified in D5.1.

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.

B6.4 The Bidder is responsible for ensuring that they have 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 D5.

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 their 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 they wish 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 their 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 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.
- B8.3 The Bid shall be submitted electronically through MERX at www.merx.com.
- B8.3.1 Bids will **only** be accepted electronically through MERX.
- B8.4 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 their own name, their 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 their 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 their 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 their duly authorized officer or officers;
 - (d) if the Bidder is carrying on business under a name other than their 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 D32. Any such costs shall be determined in accordance with D32.
- 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.

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 their 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 their 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 their 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 their 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 their 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 their sole discretion:
- (a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of their 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 their 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 their 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 their 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);
- (d) have completed the Accessible Customer Service online training required by the Accessibility for Manitobans Act (AMA) (see B13.5 and D7).

B13.4 Further to B13.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

- (a) Written confirmation of a safety and health certification meeting SAFE Work Manitoba's SAFE Work Certified Standard (e.g., COR™ and SECOR™) 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 Further to B13.3(d), the Bidder acknowledges they and all Subcontractors have obtained training required by the Accessibility for Manitobans Act (AMA) available at <http://www.accessibilitymb.ca/training.html> for anyone that may have any interaction with the public on behalf of the City of Winnipeg.
- B13.6 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.
- B13.7 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 their 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.
- 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.
- 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 their 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 their Bid or in other information required to be submitted, that they are 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 their 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 D32 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 their 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
- 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 a minor rehabilitation of the St. James Bridges, including superstructure and approach roadwork repairs.

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

- (a) Southbound bridge concrete deck and sidewalk repairs;
- (b) Southbound bridge concrete barrier repairs;
- (c) Southbound bridge pedestrian handrail repairs;
- (d) Southbound bridge south expansion joint repairs;
- (e) Southbound bridge south abutment support pipe concrete repairs;
- (f) Southbound bridge north and south approach curb concrete repairs;
- (g) Southbound bridge north and south approach roadworks including asphalt overlay repairs;
- (h) Northbound bridge concrete deck and sidewalk repairs;
- (i) Northbound bridge concrete barrier repairs;
- (j) Northbound bridge expansion joint repairs; and
- (k) Northbound bridge north approach roadworks including full depth road patches and joint repairs.

D4. SITE INVESTIGATION DUE DILIGENCE AND RISK

D4.1 Notwithstanding C3.1, the Contractor acknowledges that the site investigation reports and other site information included in this Tender have been provided to it and may be relied upon by the Contractor to the extent that the Contractor uses Good Industry Practice in interpreting such report(s) and site information and carries out the Work in accordance with Good Industry Practice based upon such report(s) and the information contained in them and such other site information. In the event that a site condition related to:

- (a) the location of any utility which can be determined from the records or other information available at the offices of any public authority or person, including a municipal corporation and any board or commission thereof, having jurisdiction or control over the utility;
- (b) the Site conditions, including but not limited to subsurface hazardous materials or other concealed physical conditions;
- (c) the location, nature, quality or quantity of the materials to be removed or to be employed in the performance of the Work;
- (d) the nature, quality or quantity of the Plant needed to perform the Work;

(e) all matters concerning access to the Site, power supplies, location of existing services, utilities or materials necessary for the completion of the Work; and

(f) all other matters which could in any way affect the performance of the Work;

that could not have been “properly inferable”, “readily apparent” and readily discoverable” using Good Industry Practice by the Contractor, results in additional Work which is a direct result of this newly discovered site condition, such additional Work will be considered by the City under Changes in Work.

D5. CONTRACT ADMINISTRATOR

D5.1 The Contract Administrator is Tetra Tech Canada Inc., represented by:

James Betke, P.Eng
Director, Transportation

Telephone No. 204 954-6852

Email Address James.Betke@tetrattech.com

D5.2 At the pre-construction meeting, the Contract Administrator will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D6. CONTRACTOR'S SUPERVISOR

D6.1 At the pre-construction meeting, the Contractor shall identify their designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D6.2 At least two (2) Business Days prior to the commencement of any Work on the site, the Contractor shall provide the Contract Administrator with a phone number where the supervisor identified in D6.1 or an alternate can be contacted twenty-four (24) hours a day to respond to an emergency.

D7. ACCESSIBLE CUSTOMER SERVICE REQUIREMENTS

D7.1 The Accessibility for Manitobans Act (AMA) imposes obligations on The City of Winnipeg to provide accessible customer service to all persons in accordance with the Customer Service Standard Regulation (“CSSR”) to ensure inclusive access and participation for all people who live, work or visit Winnipeg regardless of their abilities.

D7.1.1 The Contractor agrees to comply with the accessible customer service obligations under the CSSR and further agrees that when providing the Goods or Services or otherwise acting on the City of Winnipeg’s behalf, shall comply with all obligations under the AMA applicable to public sector bodies.

D7.1.2 The accessible customer service obligations include, but are not limited to:

- (a) providing barrier-free access to goods and services;
- (b) providing reasonable accommodations;
- (c) reasonably accommodating assistive devices, support persons, and support animals;
- (d) providing accessibility features e.g. ramps, wide aisles, accessible washrooms, power doors and elevators;
- (e) inform the public when accessibility features are not available;
- (f) providing a mechanism or process for receiving and responding to public feedback on the accessibility of all goods and services; and
- (g) providing adequate training of staff and documentation of same.

D8. UNFAIR LABOUR PRACTICES

- D8.1 Further to C3.2, the Contractor declares that in bidding for the Work and in entering into this Contract, the Contractor and any proposed Subcontractor(s) conduct their respective business in accordance with established international codes embodied in United Nations Universal Declaration of Human Rights (UDHR) <https://www.un.org/en/about-us/universal-declaration-of-human-rights> International Labour Organization (ILO) [https://www.ilo.org/global/lang--en/index.htm](https://www.ilo.org/global/lang-en/index.htm) conventions as ratified by Canada.
- D8.2 The City of Winnipeg is committed and requires its Contractors and their Subcontractors, to be committed to upholding and promoting international human and labour rights, including fundamental principles and rights at work covered by ILO eight (8) fundamental conventions and the United Nations Universal Declaration of Human Rights which includes child and forced labour.
- D8.3 Upon request from the Contract Administrator, the Contractor shall provide disclosure of the sources (by company and country) of the raw materials used in the Work and a description of the manufacturing environment or processes (labour unions, minimum wages, safety, etc.).
- D8.4 Failure to provide the evidence required under D8.3, may be determined to be an event of default in accordance with C18.
- D8.5 In the event that the City, in its sole discretion, determines the Contractor to have violated the requirements of this section, it will be considered a fundamental breach of the Contract and the Contractor shall pay to the City a sum specified by the Contract Administrator in writing ("Unfair Labour Practice Penalty"). Such a violation shall also be considered an Event of Default, and shall entitle the City to pursue all other remedies it is entitled to in connection with same pursuant to the Contract.
- D8.5.1 The Unfair Labour Practice Penalty shall be such a sum as determined appropriate by the City, having due regard to the gravity of the Contractor's violation of the above requirements, any cost of obtaining replacement goods/ services or rectification of the breach, and the impact upon the City's reputation in the eyes of the public as a result of same.
- D8.5.2 The Contractor shall pay the Unfair Labour Practice Penalty to the City within thirty (30) Calendar Days of receiving a demand for same in accordance with clause D8.5. The City may also hold back the amount of the Unfair Labour Practice Penalty from payment for any amount it owes the Contractor.
- D8.5.3 The obligations and rights conveyed by this clause survive the expiry or termination of this Contract, and may be exercised by the City following the performance of the Work, should the City determine, that a violation by the Contractor of the above clauses has occurred following same. In no instance shall the Unfair Labour Practice Penalty exceed the total of twice the Contract value.

D9. FURNISHING OF DOCUMENTS

- D9.1 Upon award of the Contract, the Contractor will be provided with 'issued for construction' Contract Documents electronically, including Drawings in PDF format only.

SUBMISSIONS

D10. AUTHORITY TO CARRY ON BUSINESS

- D10.1 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.

D11. SAFE WORK PLAN

- D11.1 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.
- D11.2 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>
- D11.3 Notwithstanding B13.4 at any time during the term of the Contract, the City may, at their 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.

D12. INSURANCE

- D12.1 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.
- D12.2 Deductibles shall be borne by the Contractor.
- D12.3 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.
- D12.4 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.

D13. CONTRACT SECURITY

- D13.1 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.

- D13.1.1 Where the contract security is a performance bond, it may be submitted in hard copy or digital format. If submitted in digital format the contract security must meet the following criteria:
- (a) the version submitted by the Contractor must have valid digital signatures and seals;
 - (b) the version submitted by the Contractor 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 D13.1(b).
- D13.1.2 Digital bonds failing the verification process will not be considered to be valid and may be determined to be an event of default in accordance with C18.1. If a digital bond fails the verification process, the Contractor may provide a replacement bond (in hard copy or digital format) within seven (7) Calendar Days of the City's request or within such greater period of time as the City in their discretion, exercised reasonably, allows.
- D13.1.3 Digital bonds passing the verification process will be treated as original and authentic.
- D13.2 The Contractor shall provide the Contract Administrator identified in D5 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.
- D13.3 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 D13.1(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.

D14. SUBCONTRACTOR LIST

- D14.1 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.

D15. EQUIPMENT LIST

- D15.1 The Contractor shall provide the Contract Administrator with a complete list of the equipment which the Contractor proposes to utilize (Form K: Equipment 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.

D16. DETAILED WORK SCHEDULE

- D16.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least ten (10) 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.
- D16.2 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; and
 - (d) a proposed schedule for traffic control;
- all acceptable to the Contract Administrator.
- D16.3 Further to D16.2(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.
- D16.4 Further to D16.2(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.
- D16.5 Further to D16.2(c), the daily manpower schedule shall list the daily number of individuals on the Site for each trade.
- D16.6 Further to D16.2(d), the traffic control schedule shall be prepared and submitted in accordance with E4, "Traffic and Pedestrian Control".

D17. REQUIREMENT FOR SITE ACCESSIBILITY PLAN

- D17.1 The Contractor shall provide the Contract Administrator with an Accessibility 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.
- D17.2 The Accessibility Plan shall demonstrate how the Contractor will accommodate the safe passage of pedestrians and cyclists in accordance with the Manual of Temporary Traffic Control, the Contract Drawings, Staging Plans, and Streets By-Law No. 1481/77 at all times for the duration of the Construction. Unless noted in the Contract, the Accessibility Plan must include a written plan for the following:
- (a) How the Contractor will maintain at least one crossing in each direction for each intersection (one north/south crosswalk and one east/west crosswalk).
 - (b) How the Contractor will maintain access to bus stops within the site.
 - (c) How the Contractor will maintain access to pedestrian corridors and half signals.
 - (d) How the Contractor will maintain cycling facilities.
 - (e) How the Contractor will maintain access to residents and businesses unless otherwise noted in the Contract.
 - (f) Any required detour signage at adjacent crossings to facilitate sidewalk or active transportation pathway closures.
- D17.3 The Accessibility Plan may also include figures, sketches, or drawings to demonstrate the proposed plan.
- D17.4 The Accessibility Plan shall include written details on how the Contractor intends to review, maintain, and document all items related to the Accessibility Plan on-site during Construction, including, but not limited to:

- (a) Signage
- (b) Temporary Ramping
- (c) Transit Stops
- (d) Detour Signage

D17.5 At minimum, the Contractor shall review the site conditions on a daily basis to ensure that all features related to the Accessibility Plan are in place. The site review is intended to correct deficiencies as a result of unforeseen events such as wind, traffic, or the general public. Deficiencies that are direct result of the Contractors actions must be corrected immediately.

D17.6 Any changes to the Accessibility Plan must be approved by the Contract Administrator.

D17.7 Upon request from the Contract Administrator, the Contractor shall provide records demonstrating that the site has been maintained.

D17.8 Deficiencies as a direct result of actions by the Contractor that are not immediately corrected and/or failure to produce records that demonstrate that the site was maintained in compliance with the Accessibility Plan may result in a pay adjustment via the monthly Progress Payment. The rate of pay adjustment will be as per the following schedule:

- (a) First Offence – A warning will be issued and documented in the weekly or bi-weekly site meeting.
- (b) Second Offence - A field instruction to immediately correct the site will be issued by the Contract Administrator.
- (c) Third and subsequent Offences – A pay reduction will be issued in the amount of \$250.00 per instance and per day.

SCHEDULE OF WORK

D18. COMMENCEMENT

D18.1 The Contractor shall not commence any Work until they are in receipt of an award letter from the Award Authority authorizing the commencement of the Work.

D18.2 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 D10;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D11;
 - (iv) evidence of the insurance specified in D12;
 - (v) the contract security specified in D13;
 - (vi) the Subcontractor list specified in D14;
 - (vii) the equipment list specified in D15;
 - (viii) the detailed work schedule specified in D16;
 - (ix) the Requirement for Site Accessibility Plan in D17; and
 - (x) the direct deposit application form specified in D29
- (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.

D18.3 The City intends to award this Contract by May 5th, 2023.

D18.3.1 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.

D19. CONSTRUCTION SCHEDULE

- D19.1 Time shall be of the essence of the Contract. The Contractor shall provide the necessary material, labour and equipment to ensure that the Works will be completed within the allocated number of Lane Closure Days, and in no case later than the date specified for Substantial Performance for all Work excluding permanent restoration. The Contractor shall be permitted to schedule the construction activities within the Contract subject to the following limitations:
- (a) The Contractor shall complete all work contained within the Contract within a total of eighty (80) Lane Closure Days for total completion of the project. A Lane Closure Day is defined as any calendar day, or part thereof, where any portion of a traffic lane is closed to the public and where the Contract Administrator determines atmospheric and Site conditions are such that the Contractor is able to work at least seven (7) hours during the period between 7:00 a.m. Winnipeg time or the time the Contractor's operations normally commence, whichever is the earlier, and 7:00 p.m. Winnipeg time. A Lane Closure Day includes any Saturday, Sunday, or Statutory or Civic holiday when the Contractor chooses to or, as per D20.1(a) and D20.1(b), is mandated to undertake Work requiring the presence of the Contract Administrator and/or City resources.
 - (b) The total number of allowed Lane Closure Days for this Contract do not need to occur consecutively, with the following exceptions:
 - (i) Once traffic control is set-up in accordance with any of the Construction Stages, all the work activities within the closed traffic lane(s) shall be completed with no interruption to traffic control and be completed in consecutive Lane Closure Days.
 - (c) The total amount of Lane Closure Days will be measured in whole numbers. The Contract Administrator will identify the number of Lane Closure days that have been used during regular site meetings.
 - (d) Construction activities and any associated traffic controls do not need to be scheduled so that work on both the Southbound Bridge and Northbound Bridge construction stages are performed concurrently. Construction activities and traffic control for each construction stage may be separated into Southbound and Northbound work. The total number of Lane Closure Days shall apply to the entire project, regardless of how the Contractor determines work to be staged.
 - (e) The Contractor shall provide a construction schedule to the Contract Administrator, outlining the proposed traffic control, a minimum of 10 working days prior to commencement of any Work at the Site.
 - (f) Any changes to traffic control shall be submitted to the Contract Administrator a minimum of 5 working days in advance of the affected work.

D20. CRITICAL STAGES

- D20.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:
- (a) Construction Staging 3 – Lane Closure for Priority Construction Area (Academy Road off-ramp Closure):
 - (i) The Contractor will be permitted one (1) full closure of the Academy Road off-ramp for Construction Staging 3 from Friday at 18:00 to the following Monday at 06:00.
 - (b) Construction Staging 3 – Lane Closure for Priority Construction Area (Portage exit ramp closure)
 - (i) The Contractor will be permitted one (1) full closure of the Portage exit ramp for Construction Stage 3 from Friday at 18:00 to the following Monday at 06:00.
 - (c) When the Contractor considers the Work associated with the Critical Stages to be completed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for the purposes of verifying Competition. 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.

- (d) The date on which the Critical Stages have been accepted by the Contract Administrator as being completed to the requirements of the Contract is the date on which completion of the Critical Stage has been achieved.

D21. SUBSTANTIAL PERFORMANCE

- D21.1 The Contractor shall achieve Substantial Performance by October 15, 2023.
- D21.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.
- D21.3 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.

D22. TOTAL PERFORMANCE

- D22.1 The Contractor shall achieve Total Performance by October 30, 2023.
- D22.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.
- D22.3 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.

D23. LIQUIDATED DAMAGES

- D23.1 If the Contractor fails to achieve Critical Stages in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Lane Closure Day for each and every Lane Closure Day following the days fixed herein for same during which such failure continues:
- (a) Critical Stages as listed in D20.1(a) and D20.1(b) – Two-thousand five hundred dollars (\$2,500).
- D23.2 If the Contractor fails to achieve Substantial Performance in accordance with the Contract by the day fixed herein for Substantial Performance or within the number of lane closure days specified, whichever occurs first, the Contractor shall pay the City one thousand, five hundred dollars (\$1,500) per Calendar Day for each and every Calendar Day following the day fixed herein for Substantial Performance during which such failure continues.
- D23.3 The amount specified for liquidated damages in D23.1 and D23.2, is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve critical stages and Substantial Performance by the day fixed herein for same.
- D23.4 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D24. COVID-19 SCHEDULE DELAYS

- D24.1 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 by the Contractor with due consideration to the health and safety of workers and the public, directives from health authorities and various levels of government and in close consultation with the Contract Administrator.
- D24.2 If the Contractor is delayed in the performance of the Work by reason of the COVID-19 pandemic, the Work schedule may be adjusted by a period of time equal to the time lost due to such delay and costs related to such delay will be determined as identified herein.
- D24.3 A minimum of seven (7) Calendar Days prior to the commencement of Work, 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, including but not limited to evidence related to availability of staff, availability of Material or work by others.
- D24.4 For any delay related to COVID-19 and identified after Work has commenced, the Contractor shall within seven (7) Calendar Days of becoming aware of the anticipated delay declare the additional delay and shall provide sufficient evidence as indicated in D24.3. Failure to provide this notice will result in no additional time delays being considered by the City.
- D24.5 The Work schedule, including the durations identified in D20 to D22 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.
- D24.6 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.
- D24.7 Any time or cost implications as a result of COVID-19 and in accordance with the above, as confirmed by the Contract Administrator, shall be documented in accordance with C7.

CONTROL OF WORK

D25. JOB MEETINGS

- D25.1 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.
- D25.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever they deem it necessary.

D26. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

- D26.1 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).

D27. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

D27.1 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 their sole discretion and acting reasonably, require updated proof of compliance, as set out in B13.4.

D28. RESPONSIBILITY FOR PLANT AND MATERIALS

D28.1 Further to C10, the Contractor shall assume the risk of and responsibility for the following Material from the time that the Contractor collects the Material from the City's Storage Site until the Material is incorporated in the Work or is removed from the Site:

(a) EMSEAL BEJS Precompressed Foam Joint Filler

D28.2 Further to C10, the Contractor shall assume the risk of and responsibility for the following Material from the time that the Contractor removes the Material from the Site until the Material is delivered into the care of the City's Storage Site:

(a) Existing aluminum balance barrier on the Northbound Bridge East (curb) Barrier

D28.3 Any Material to be collected from or delivered to the City's Storage Site shall be made to the attention of Mike Terleski (204-794-8510) at the following address by providing a minimum three (3) business days notice:

(a) City of Winnipeg – Public Works Yard at 960 Thomas Avenue, Winnipeg, Manitoba

MEASUREMENT AND PAYMENT

D29. PAYMENT

D29.1 Further to C12, the City shall make payments to the Contractor by direct deposit to the Contractor's banking institution, and by no other means. Payments will not be made until the Contractor has made satisfactory direct deposit arrangements with the City. Direct deposit application forms are at https://winnipeg.ca/finance/files/Direct_Deposit_Form.pdf.

WARRANTY

D30. WARRANTY

D30.1 Warranty is as stated in C13.

D30.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire two (2) years thereafter unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

D30.2 Notwithstanding C13.2 or D30.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if:

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

D30.2.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

DISPUTE RESOLUTION

D31. DISPUTE RESOLUTION

- D31.1 If the Contractor disagrees with any opinion, determination, or decision of the Contract Administrator, the Contractor shall act in accordance with the Contract Administrator's opinion, determination, or decision unless and until same is modified by the process followed by the parties pursuant to D31.
- D31.2 The entire text of C21.4 is deleted, and amended to read: "Intentionally Deleted"
- D31.3 The entire text of C21.5 is deleted, and amended to read:
- (a) If Legal Services has determined that the Disputed Matter may proceed in the Appeal Process, the Contractor must, within ten (10) Business Days of the date of the Legal Services Response Letter, submit their written Appeal Form, in the manner and format set out on the City's Materials Management Website, to the Chief Administrative Officer, and to the Contract Administrator. The Contractor may not raise any other disputes other than the Disputed Matter in their Appeal Form.
- D31.4 Further to C21, prior to the Contract Administrator's issuance of a Final Determination, the following informal dispute resolution process shall be followed where the Contractor disagrees with any opinion, determination, or decision of the Contract Administrator ("Dispute"):
- (a) In the event of a Dispute, attempts shall be made by the Contract Administrator and the Contractor's equivalent representative to resolve Disputes within the normal course of project dealings between the Contract Administrator and the Contractor's equivalent representative.
 - (b) Disputes which in the reasonable opinion of the Contract Administrator or the Contractor's equivalent representative cannot be resolved within the normal course of project dealings as described above shall be referred to a without prejudice escalating negotiation process consisting of, at a minimum, the position levels as shown below and the equivalent Contractor representative levels:
 - (i) The Contract Administrator;
 - (ii) Supervisory level between the Contract Administrator and applicable Department Head;
 - (iii) Department Head.
- D31.5 Names and positions of Contractor representatives equivalent to the above City position levels shall be determined by the Contractor and communicated to the City at the pre-commencement or kick off meeting.
- D31.6 As these negotiations are not an adjudicative hearing, neither party may have legal counsel present during the negotiations.
- D31.7 Both the City and the Contractor agree to make all reasonable efforts to conduct the above escalating negotiation process within twenty (20) Business Days, unless both parties agree, in writing, to extend that period of time.
- D31.8 If the Dispute is not resolved to the City and Contractor's mutual satisfaction after discussions have occurred at the final escalated level as described above, or the time period set out in D31.7, as extended if applicable, has elapsed, the Contract Administrator will issue a Final Determination as defined in C1.1(v), at which point the parties will be governed by the Dispute Resolution process set out in C21.

THIRD PARTY AGREEMENTS

D32. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS

- D32.1 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.
- D32.2 Further to D32.1, in the event that the obligations in D32 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.
- D32.3 For the purposes of D32:
- (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.
- D32.4 Modified Insurance Requirements
- D32.4.1 If not already required under the insurance requirements identified in D12, 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 their Ministers, officers, employees, and agents shall be added as additional insureds.
- D32.4.2 If not already required under the insurance requirements identified in D12, 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.
- D32.4.3 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.
- D32.4.4 Further to D12.3, 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.
- D32.4.5 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.
- D32.5 Indemnification By Contractor
- D32.5.1 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.

- D32.5.2 The Contractor agrees that in no event will Canada or Manitoba, their respective officers, servants, employees or agents be held liable for any damages in contract, tort (including negligence) or otherwise, for:
- (a) any injury to any person, including, but not limited to, death, economic loss or infringement of rights;
 - (b) any damage to or loss or destruction of property of any person; or
 - (c) any obligation of any person, including, but not limited to, any obligation arising from a loan, capital lease or other long term obligation;
- in relation to this Contract or the Work.
- D32.6 Records Retention and Audits
- D32.6.1 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.
- D32.6.2 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 D32.6.1 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.
- D32.7 Other Obligations
- D32.7.1 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.
- D32.7.2 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.
- D32.7.3 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.
- D32.7.4 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.
- D32.7.5 The Contractor represents and warrants that no current or former public servant or public office holder, to whom the Value and Ethics Code for the Public Sector, the Policy on Conflict of Interest and Post Employment, or the Conflict of Interest Act applies, shall derive direct benefit from this Contract, including any employment, payments, or gifts, unless the provision or receipt of such benefits is in compliance with such codes and the legislation.

D32.7.6 The Contractor represents and warrants that no member of the House of Commons or of the Senate of Canada or of the Legislative Assembly of Manitoba is a shareholder, director or officer of the Contractor or of a Subcontractor, and that no such member is entitled to any benefits arising from this Contract or from a contract with the Contractor or a Subcontractor concerning the Work.

FORM H1: PERFORMANCE BOND
(See D13)

KNOW EVERYONE 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. 987-2022

MINOR REHABILITATION OF ST. JAMES BRIDGES

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 D13)

KNOW EVERYONE 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. 987-2022

MINOR REHABILITATION OF ST. JAMES BRIDGES

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)

FORM K: EQUIPMENT
(See D15)

MINOR REHABILITATION OF ST. JAMES BRIDGES

<p>1. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>2. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>3. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>

FORM K: EQUIPMENT
(See D15)

MINOR REHABILITATION OF ST. JAMES BRIDGES

<p>4. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>5. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>6. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>

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 their 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>Specification No.</u>	<u>Specification Title</u>
	Table of Contents
CW1110	General Instructions
CW1120	Existing Services, Utilities and Structures
CW1130	Site Requirements

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
B101-22-001/B102-22-001	Cover Sheet
B101-22-002/B102-22-002	Site Plan, Design Data, and Drawing List
B101-22-003	Southbound Bridge Partial Plan – South Approach
B101-22-004	Southbound Bridge Partial Plan – Continued
B101-22-005	Southbound Bridge Partial Plan – Continued
B101-22-006	Southbound Bridge Partial Plan – North Approach
B101-22-007	West Barrier Front Elevation
B101-22-008	East Barrier Front Elevation
B101-22-009	Typical Barrier and Deck Repair Details
B101-22-010	South Expansion Joint Repair Details
B101-22-011	Sidewalk Curb and South Abutment Repair Details
B102-22-003	Northbound Bridge Partial Plan – Kenaston Ramp
B102-22-004	Northbound Bridge Partial Plan – Academy Ramp
B102-22-005	Northbound Bridge Partial Plan – Piers 5, 6, 11, 12 and 13
B102-22-006	Northbound Bridge Partial Plan – Piers 13 to 15
B102-22-007	Northbound Bridge Partial Plan – Piers 15 to 17
B102-22-008	Northbound Bridge Partial Plan – North Approach
B102-22-009	Kenaston West Barrier Front Elevation
B102-22-010	Kenaston East Barrier Front Elevation
B102-22-011	Academy West Barrier Front Elevation
B102-22-012	Academy East Barrier Front Elevation
B102-22-013	Northbound East Barrier Front Elevation
B102-22-014	Northbound West Barrier Front Elevation
B102-22-015	Typical Barrier and Deck Repair Details

B102-22-016	Kenaston Ramp South Abutment, Pier 2, 5, 6 / 12 Expansion Joint Repair Details
B102-22-017	Academy Ramp South Abutment, Pier 8, 11 Expansion Joint Repair Details
B102-22-018	Piers 13, 17, 18 Expansion Joint Repair Details
B102-22-019	North Abutment and Typical Expansion Joint Repair Details
B102-22-020	Northbound Bridge North Approach Roadworks Repair Details

E1.5 The following Drawings are provided for the Contractor's reference in Appendix 'A'.

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
B101-22-012/B102-22-021	Construction Staging 1 (Sheet 1 of 2)
B101-22-013/B102-22-022	Construction Staging 1 (Sheet 2 of 2)
B101-22-014/B102-22-023	Construction Staging 2 (Sheet 1 of 2)
B101-22-015/B102-22-024	Construction Staging 2 (Sheet 2 of 2)
B101-22-016/B102-22-025	Construction Staging 3
B101-82-05	South Abutment
B101-82-06	North Abutment
B101-82-07	Abutment Reinforcing
B101-82-27	Deck Reinforcement
B101-82-30	Approach Slabs
B101-82-32	Concrete Traffic Barrier Details
B101-82-33	Pedestrian Handrail
B101-16-07	St. James SB Expansion Joint Layout – Proposed
B101-16-08	St. James SB Expansion Joint Details
B102-87-13	Kenaston Abut. To Pier 5 Deck Reinforcing
B102-87-15	Academy Rd. Abut Pier 1: Deck Reinforcing
B102-87-17	Piers 5 & 11 to Pier 13 Deck Reinforcing
B102-87-19	Pier13 to Pier 15 Deck Reinforcing
B102-87-21	Pier 15 to Pier 17 Deck Reinforcing
B102-87-23	Pier 17 to North Abutment Deck Reinforcing
B102-87-24	Bridge Concrete Traffic Barrier Details
B102-87-26	New Expansion Joints 1 of 2
B102-87-27	New Expansion Joints 2 of 2

GENERAL REQUIREMENTS

E2. HAZARDOUS MATERIALS

E2.1 If asbestos or other hazardous materials are encountered during the Work of the Contract, the Contractor shall stop all work and notify the Contract Administrator immediately. Removal of hazardous materials shall be dealt with by the City and the Contractor shall await further instruction by the Contract Administrator.

E3. SHOP DRAWINGS

E3.1 Description

E3.1.1 This Specification provides instructions for the preparation and submission of Shop Drawings. The term 'Shop Drawings' means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data including Site erection drawings, which are to be provided by the Contractor to illustrate details of the portion of the Work

- E3.1.2 Further to C6.9, the Contractor shall arrange for the preparation of Shop Drawings required by the Contract, or as reasonably required by the Contract Administrator.
- E3.1.3 The Contractor shall submit to the Contract Administrator for review, all specified Shop Drawings. All submissions shall be in metric units. Where data is in Imperial units, the correct metric equivalent shall also be shown on all submissions.
- E3.2 Shop Drawings
- E3.2.1 Original drawings shall be prepared by the Contractor to illustrate the Work including fabrication, layout, setting, or erection details.
- E3.2.2 Shop Drawings shall be sealed by a Professional Engineer licenced to practice in the Province of Manitoba.
- E3.3 Contractor's Responsibilities
- E3.3.1 The Contractor is responsible for:
- (a) Verifying field conditions and measurements, and Contract requirements for design of temporary works and preparation of Shop Drawings;
 - (b) Reviewing Shop Drawings, product data, and equipment prior to submission and stamping and signing the drawings indicating conformance with the Contract requirements;
 - (c) Promptly submitting and distributing Shop Drawings in an orderly sequence to prevent delay in the Work; and
 - (d) Correcting, revising and resubmitting as required based on Contractor or Contract Administrator review directing specific attention to revisions.
- E3.3.2 Responsibility for errors and omissions in Shop Drawings is not relieved by Contract Administrator's review.
- E3.3.3 Responsibility for deviations in Shop Drawings from Contract requirements is not relieved by the Contract Administrator's review, unless Contract Administrator provides written acceptance of the deviations.
- E3.4 Submittal Requirements
- E3.4.1 Allow for a five (5) Business Day period for review by the Contract Administrator of each individual and re-submission.
- E3.4.2 Accompany Shop Drawings with transmittal letter containing:
- (a) Project title and Tender No.;
 - (b) Shop Drawing title and description;
 - (c) Reference to relevant Specification section and clause;
 - (d) Reference to relevant Drawing number;
 - (e) Revision number and date; and
 - (f) Contractor's name and address.
- E3.4.3 Shop Drawings shall include:
- (a) Project title and Tender No.;
 - (b) Shop Drawing title;
 - (c) Identification of products, materials and equipment including supplier, and/or manufacturer;
 - (d) Relation to existing structure or materials;
 - (e) Field dimensions, clearly identified as such;
 - (f) Revision number and date;
 - (g) Engineer's seal (signed and dated).

E3.5 Other Considerations

- E3.5.1 Fabrication, erection, or installation may require modifications to equipment or systems to conform to the design intent. Revise pertinent Shop Drawings and resubmit.
- E3.5.2 No Work shall commence until the pertinent Shop Drawings have been submitted and accepted.
- E3.5.3 No delay or cost claims will be allowed that arise because of delays in submissions, resubmissions, and review of the Shop Drawings.

E3.6 Measurement and Payment

- (a) The preparation and submission of shop drawings shall be considered incidental to the Work and no separate measurement or payment will be made.

E4. TRAFFIC AND PEDESTRIAN CONTROL

E4.1 Description

- (a) The Work covered under this item shall include all items relating to traffic and pedestrian control at the Site as described below.

E4.2 References

- (a) City of Winnipeg – Manual of Temporary Traffic Control on City Streets (the Manual);
- (b) Construction Staging reference drawings in Appendix A; and
- (c) CW 1130 – Site Requirements.

E4.3 Construction Methods

E4.3.1 General

- (a) The Contract Administrator shall be responsible for submitting all lane closure requests to the City of Winnipeg Traffic Services.
- (b) The Contract Administrator shall make arrangements with the Traffic Services Branch of the City of Winnipeg to supply, place, maintain, and remove all traffic control devices authorized and/or required by the Traffic Management Branch.
- (c) The Contractor shall provide the Contract Administrator a minimum of three (3) business days notice when the Contractor deems it necessary to modify work zones and/or traffic stages.
- (d) The Contractor shall provide and maintain flagmen in accordance with the above-mentioned manual.
- (e) The Contractor shall take all other safety measures necessary to cope with any peculiar or unusual circumstances that have not been set out in the above-mentioned manual and shall, at all times, ensure that maximum protection is afforded to the road-user and that their operations in no way interfere with the safe operation of traffic.
- (f) During the hours when the Contractor is not working, equipment and stockpiled materials shall be left in such a location so as not to interfere with or present a hazard to motorists or pedestrians.
- (g) Emergency vehicle access must be maintained at all times.
- (h) The Contractor shall only have at most one construction stage active on each bridge at any one time.

E4.3.2 Pedestrian Controls

- (a) The Contractor shall be responsible for pedestrian controls as it relates to work on the bridge sidewalks.
- (b) The Contractor shall submit a pedestrian control plan to the City for review a minimum of five (5) business days before any work or closures commences on the bridge sidewalks. The pedestrian control plan shall consider the limited crossing

opportunities for the bridges and shall provide sufficient advance warning for all pedestrians.

- (c) Pedestrian traffic control shall be in accordance with the City of Winnipeg's "Manual of Temporary Traffic Control on City Streets".
- (d) The Contractor shall maintain sidewalk access on at least one of the bridges at all times.

E4.4 Submittals

- (a) The Contractor shall submit the following for review a minimum of ten (10) Calendar Days prior to implementing the lane and/or sidewalk closure(s) or performing any Work on Site.
 - (i) Indicate the date and time that each traffic stage is to be implemented by the Traffic Services Branch; and
 - (ii) Indicate the date and time that each traffic stage is to be removed by the Traffic Services Branch.

E4.5 Measurement and Payment

- (a) Further to CW1130 Section 4, Work associated with this specification will not be measured for payment and will be considered incidental to the Contract.

E5. MOBILIZATION AND DEMOBILIZATION PAYMENT

E5.1 Description

- E5.1.1 This Specification shall cover all operations relating to the mobilization and demobilization of the Contractor to the Bridge Site, as specified herein.
- E5.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

E5.2 Scope of Work

- E5.2.1 The Work under this Specification shall include but not be limited to:
 - (a) Mobilizing and demobilizing on-site Work facilities;
 - (b) Installing, maintaining and removing any access roadways; and
 - (c) Restoring all existing facilities.

E5.3 Materials

- E5.3.1 All materials supplied under this Specification shall be of a type approved by the Contract Administrator, and shall be subject to inspection and testing by the Contract Administrator.
- E5.3.2 The Contractor shall be responsible for the supply, safe storage and handling of all materials as set forth in this Specification. All materials shall be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

E5.4 Equipment

- E5.4.1 All equipment shall be of a type acceptable to the Contract Administrator and shall be kept in good working order.

E5.5 Construction Methods

E5.5.1 Site Inspection

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

E5.5.2 Layout of On-Site Work Facilities

- (a) The Contractor shall mobilize all on-site Work and other temporary facilities.
- (b) Possible locations for the Contractor's staging areas include the closed portion of the staged lanes. The Contractor shall coordinate with relevant parties to make arrangements for use of these areas.
 - (i) The Contractor shall also be responsible to ensure the laydown area(s) do not interfere with road users or pedestrians and that road users and pedestrians are sufficiently protected from objects in the laydown area(s) that may pose a hazard. Placement of large, fixed objects adjacent to live lanes of traffic pose a hazard to users. Should the Contractor desire to use these areas for laydown the Contractor shall submit a plan for adequately protecting the roadside hazard. The plan is to be sealed by an Engineer registered to practice in the Province of Manitoba.
- (c) Upon completion of construction activities, the Contractor shall remove all on-site Work and other temporary facilities, and restore to pre-existing conditions.

E5.5.3 Cellular Telephone Communication

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

E5.6 Quality Control

E5.6.1 Inspection

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

E5.6.2 Access

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

E5.7 Measurement and Payment

E5.7.1 Mobilization and demobilization shall not be measured. This item of work shall be paid for at the Contract Lump Sum Price for "Mobilization and Demobilization", which price shall be paid in full for supply all materials and performing all operations herein described and all other items incidental to the Work. Payment will be based on the following breakdown:

- (a) When Contract Administrator is satisfied that construction has commenced at the Site. 30%
- (b) During construction, percentage distributed equally on a monthly basis at the discretion of the Contract Administrator. 60%
- (c) Upon completion of the Work. 10%

E6. CONCRETE REPAIRS

E6.1 Description

- (a) This Specification shall cover all operations relating to the preparation of Portland Cement concrete for, and all concreting operations related to, the all concrete repair works 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 things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E6.2 Scope of Work

- (a) Supplying and placing concrete for Type 1 barrier repairs;
- (b) Supplying and placing concrete for Type 2 barrier repairs;
- (c) Supplying and placing concrete for Type 1 bridge deck and sidewalk delamination and defect repairs;
- (d) Supplying and placing concrete for curb repairs;
- (e) Supplying and placing concrete for Southbound Bridge North and South Approach Curb repairs;
- (f) Supplying and placing concrete for Southbound Bridge south abutment pipe support concrete repairs;
- (g) Supplying and placing concrete for expansion joint repairs; and
- (h) All other items specified herein.

E6.2.1 Submittals

(a) General

- (i) 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.
- (ii) The Contractor shall submit to the Contract Administrator for review and approval, at least ten (10) Business Days prior to the commencement of any Work on Site, the proposed materials to be used.

(b) Concrete Mix Design Requirements

- (i) The Contractor shall submit a concrete mix design statement to the Contract Administrator for each of the concrete types specified herein 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). In addition, the mix design statement must indicate the expected method of placement (buggies, chute, or pump) methods are to be used, the method of placement must include a clear description of the pumping methods (line, vertical drop, length of hose, etc.).
- (ii) The Supplier shall submit directly, in confidence, to the City of Winnipeg, the concrete mix designs for each of the concrete types 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 proportions, and at the minimum the following:
 - ◆ Cementitious content in kilograms per cubic metre or equivalent units, and type of cementitious materials;
 - ◆ Designated size, or sizes, of aggregates, and the gradation;
 - ◆ Aggregate source location(s);
 - ◆ Weights of aggregates in kilograms per cubic metre or equivalent units. Mass of aggregates is saturated surface dry basis;
 - ◆ Maximum allowable water content in kilograms per cubic metre or equivalent units and the water/cementitious ratio;
 - ◆ The limits for slump;
 - ◆ The limits for air content; and
 - ◆ Quantity of other admixtures.

- (iii) The concrete mix design statements must be received by the Contract Administrator a minimum of ten (10) Business Days prior to the scheduled commencement of concrete placement for each of the concrete types. The concrete mix designs must be received by the City of Winnipeg a minimum of five (5) Business Days prior to the scheduled commencement of concrete placement for each of the concrete types.
 - (iv) The mix design statement shall also include the expected slump measurement for each concrete type. The tolerances for acceptance of slump measurements in the field, by the Contract Administrator, shall be in accordance to CSA A23.1-19 Clause 4.3.2.3.2.
 - (v) 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.
- (c) Concrete Mix Design Test Data
- (i) Concrete
 - ◆ The Contractor shall submit to the Contract Administrator for review and approval, at least ten (10) Business Days prior to the scheduled commencement of concrete placement, test data showing that the concrete to be supplied will meet the performance criteria stated in this Specification for each concrete type.
 - ◆ All tests shall be based on the concrete samples taken from the point of discharge into the formwork. For example, at the concrete chute from the delivery truck if being placed by buggies, or at the end of the pump line should the Contractor choose to pump the concrete into place.
 - ◆ Samples of concrete for test specimens shall be taken in accordance with CSA Standard Test Method CSA-A23.2-1C-19, "Sampling Plastic Concrete".
 - (ii) Aggregates
 - ◆ The Contractor shall furnish, in writing to the Contract Administrator for review and approval, at least ten (10) Business Days prior to the scheduled commencement of concrete placement, the location of the sources where aggregate will be obtained in order that some may be inspected and tentatively accepted by the Contract Administrator. Changes in the source of aggregate supply during the course of the Contract shall not be permitted without notification in writing to and the expressed approval of the Contract Administrator.
 - ◆ The Contractor shall submit to the Contract Administrator for review and approval recent test information on sieve analysis of fine and coarse aggregates in accordance with CSA Standard Test Method A23.2-2A. The Contractor shall submit to the Contract Administrator for review and approval recent test information on tests for organic impurities in fine aggregates for concrete, in accordance with CSA Standard Test Method A23.2- 7A.
 - ◆ The Contractor shall submit to the Contract Administrator for review and approval recent test information on relative density and absorption of coarse aggregate, in accordance with CSA Standard Test Methods A23.2-12A.
 - ◆ The Contractor shall submit to the Contract Administrator for review and approval recent test information on petrographic examination of aggregates for concrete, in accordance with CSA Standard Test Methods A23.2-15A. The purpose of the petrographic analysis is to ensure the aggregates provided are of the highest quality for use in the production of concrete and will produce a durable overlay. An acceptable

aggregate will have an excellent rating as Judged by an experienced petrographer, with a (weighted) petrographic number typically in the range of one hundred (100) to one hundred and twenty (120). The Contractor shall submit to the Contract Administrator for review and approval recent test information on resistance to degradation of large-size coarse aggregate by abrasion and impact in the Los Angeles Machine, in accordance with CSA Standard Test Method A23.2-16A.

- ◆ The Contractor shall submit to the Contract Administrator for review and approval recent test information on potential alkali reactivity of cement aggregate combinations (mortar bar method), in accordance with CSA Standard Test Method A23.2-27A.
- (iii) The Contractor shall submit to the Contract Administrator copies of all material quality control test results.
- (d) Notification of Ready Mix Supplier
 - (i) The Contractor shall submit to the Contract Administrator the name and qualifications of the Ready Mix Concrete Supplier that he is proposing to use, at least ten (10) Business Days prior to the scheduled commencement of concrete placement. The Contract Administrator will verify the acceptability of the Supplier and the concrete mix design requirements. Acceptance of the Supplier and the concrete mix design(s) by the Contract Administrator does not relieve or reduce the responsibility of the Contractor or Supplier from the requirements of this Specification.
- (e) Concrete Pour Sequence and Schedule
 - (i) The Contractor shall submit to the Contract Administrator for review and approval, at least ten (10) Business Days prior to scheduled commencement of concrete placement, the proposed concrete placement schedule for all other structural concrete placements of this Specification.

E6.3 Materials

E6.3.1 General

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

E6.3.2 Testing and Approval

- (a) All materials supplied under this Specification shall 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 approved by the Contract Administrator at least seven (7) Calendar Days before any construction is undertaken. If, in the opinion of the Contract Administrator, such materials in whole or in part, do not conform to the Specifications detailed herein or are found to be defective in manufacture or have become damaged in transit, storage, or handling operations, then such materials shall be rejected by the Contract Administrator and replaced by the Contractor at his/her own expense.

E6.3.3 Epoxy Adhesive

- (a) Epoxy adhesive for bonding steel reinforcing or dowels to concrete shall be Hilti Hit-RE 500 or equal as accepted by the Contract Administrator, in accordance with B7, "Substitutes".

E6.3.4 Concrete Mortar Repair

- (a) The concrete repair mortar for Type 1A barrier repairs shall be a product suitable for application by hand trowelling or form and pour or pump. The mortar product shall be SikaTop 122 Plus for application by hand trowelling or Sikacrete-08 SCC for form and pour or pump or equivalent as approved in accordance with B7, "Substitutes".

Preparation, mixing, application, and curing in accordance with manufacturer's specifications.

E6.3.5 Concrete Strength and Workability

(a) Structural Concrete

- (i) Proportioning of fine aggregate, coarse aggregate, cement, water, and air-entraining agent shall be such as to yield concrete having the required strength and workability, as follows:

Type C1 Concrete

- Minimum Compressive Strength @ 28 days = 35 MPa
- Aggregate: 10mm nominal
- Air Content: 5.0% to 8.0%
- Chloride Ion Penetrability at 56 days: < 1500 coulombs

E6.3.6 Concrete Aggregate

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

(i) Fine Aggregate

- ◆ Fine aggregate shall consist of sand having clean, hard, strong, durable, uncoated grains; free from injurious amounts of dust, soft or flaking particles, shale, alkali, organic matter, load, or other deleterious substance.
- ◆ Fine aggregate shall be well-graded throughout and shall conform to the following grading requirements:

Sieve Size	Percent of Total Dry Weight Passing Each Sieve
10 mm	100%
5 mm	95 – 100%
2.5 mm	80 – 100%
1.25 mm	50 – 90%
630 µm	25 – 65%
315 µm	10 – 35%
160 µm	2 – 10%
80 µm	0 – 3%

- (ii) Coarse Aggregate (10 mm Nominal) Coarse aggregate shall be clean and free from alkali, organic, or other deleterious matter, shall have an absorption not exceeding three percent (2%), and shall conform to the following gradation requirements:

Sieve Size	Percent of Total Dry Weight Passing Each Sieve
28 mm	-
20 mm	-
14 mm	100%
10 mm	85 - 100%
5 mm	10 - 30%
2.5 mm	0 - 10%
1.25 mm	0 – 5%

E6.3.7 Cementitious Materials

- (a) Cementitious materials shall conform to the requirements of CSA-A3001 and shall be free from lumps.
- (b) Should the Contractor choose to include a silica fume admixture in the concrete mix design, the substitution of silica fume shall not exceed eight percent (8%) by mass of cement.
- (c) Should the Contractor choose to include fly ash in the concrete mix design, the fly ash shall be Class C1 or F and the substitution shall not exceed thirty percent (30%) 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 the formation of lumps, shall not be used in the Work.

E6.3.8 Water

- (a) Water to be used for all operations in the Specification, including mixing and curing of concrete or grout, surface texturing operations, and saturating the substrate shall conform to the requirements of CSA A23.1 and shall be free of oil, alkali, acidic, organic materials, or deleterious substances. The Contractor shall not use water from shallow, stagnant, or marshy sources.

E6.3.9 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, unless otherwise approved by the Contract Administrator.

E6.3.10 Bonding Agents

- (a) Latex Bonding Agent
 - (i) Latex bonding agent shall be SikaCem 810, or equal as accepted by the Contract Administrator, in accordance with B7. Polyvinyl acetate-based latexes will not be permitted. Planicrete AC by MAPEI is approved for use as a latex bonding agent on concrete greater than twenty-eight (28) days in age.
- (b) Epoxy Bonding Agent
 - (i) Epoxy bonding agent shall be SikaTop Armatec 110 EpoCem or equal as approved by the Contract Administrator.

E6.3.11 Bonding Grout

- (a) For latex bonding grouts, the grout for bonding the new barrier concrete to the existing barrier concrete shall be mixed in an agitating hopper slurry pump and shall consist of the following constituents, by weight:
 - (i) One (1) part water;
 - (ii) One (1) part latex bonding agent; and,
 - (iii) One and a half (1½) parts Type GUSF Portland cement.
- (b) The consistency of the bonding grout shall be such that it can be brushed on the existing concrete surface in a thin, even coating that will not run or puddle in low spots.

E6.3.12 Curing Compound

- (a) Curing compounds shall be liquid membrane-forming and conform to the requirements of ASTM Standard C309-98a.

- (b) Curing compounds shall be resin-based and white-pigmented.
- (c) WR Meadows 1215 WHITE Pigmented Curing Compound is an approved product, or equal as accepted by the Contract Administrator, in accordance with B7 "Substitutes".

E6.3.13 Curing Blankets

- (a) Curing blankets for wet curing shall be one hundred percent (100%) polyester, 3 mm thick, white in colour. An approved product is "Mirafi Geotextile P150". Alternately, a 10 oz burlap, 5 mil polyethylene, curing blanket white in colour shall be used; "Curelap" manufactured by Midwest Canvas, together with a second layer of burlap, or equal as accepted by the Contract Administrator, in accordance with B7.

E6.3.14 Patching Mortar

- (a) Patching mortar shall be made of the same material and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than one (1) part cement to two (2) parts sand by damp loose volume. White Portland Cement shall be substituted for a part of the grey Portland Cement on exposed concrete in order to produce a colour matching the colour of the surrounding concrete, as determined by a trial patch. The quantity of mixing water shall be no more than necessary for handling or placing.

E6.3.15 Reinforcing Steel

- (a) All reinforcing steel shall conform to the requirements of CAN/CSA G30.18, Grade 400W.

E6.3.16 Bar Accessories

- (a) Bar accessories shall be of a type approved by the Contract Administrator. They shall be made from a non-rusting material, and shall not stain, blemish, or spall the concreted surface for the life of the concrete.
- (b) Bar chairs, bolsters, and bar supports shall be cementitious material as acceptable to the Contract Administrator. Plastic, PVC or galvanized bar chairs may be permitted if accepted in writing by the Contract Administrator prior to installation.

E6.3.17 Formwork

- (a) Formwork materials shall conform to CAN/CSA Standard A23.1, and American Concrete Publication SP4, "Formwork for Concrete."
- (b) Form sheeting plywood to be covered with form liner or to be directly in contact with soil shall be exterior Douglas Fir, concrete form grade, conforming to CSA Standard O121, a minimum of 20 mm thick.
- (c) Where form liner is not being used, form sheeting shall be Douglas Fir, overlay form liner type conforming to CSA Standard O121. Approved Manufacturers are "Evans" and "C-Z."
- (d) Boards used for formwork shall be fully seasoned and free from defects such as knots, warps, cracks, etc., which may mark the concrete surface.
- (e) 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 stainless steel; and they shall not stain, blemish, or spall the concrete surface for the life of the concrete.
- (f) Forms for exposed surfaces that do not require a form liner may be either new plywood or steel as authorized by the Contract Administrator.
- (g) Studding shall be spruce or pine and shall have such dimensions and spacing that they shall withstand without distortion all the forces to which the forms shall be subjected.
- (h) Walers shall be spruce or pine, with minimum dimensions of 100 mm x 150 mm. Studding shall be spruce or pine, with minimum dimensions of 50 x 150.

- (i) Stay-in-place formwork or falsework is not acceptable and shall not be used by the Contractor unless specifically shown on the Drawings.

E6.3.18 Form Coating

- (a) Form coating shall be "Sternson C.R.A." by Sternson, "SCP Strip Ease" by Specialty Construction Products, or equal as accepted by the Contract Administrator, in accordance with B7.

E6.3.19 Permeable Formwork Liner

- (a) Formwork liner shall be Texel Drainaform, Hydroform, or equal as accepted by the Contract Administrator, in accordance with B7. This formwork liner shall be used on all exposed substructure and superstructure formed surfaces, except soffit surfaces, or where a normal form finish is specified.

E6.4 Equipment

(a) General

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

(b) Supply of Structural Concrete

- (i) All structural concrete shall be supplied from a plant certified by the Manitoba Ready Mix Concrete Association. The Contractor, upon request from the Contract Administrator, shall furnish proof of this certification.
- (ii) All mixing of concrete must meet the provisions of CSA A23.1-19, Clause 5.2, Production of Concrete.
- (iii) Time of Hauling
 - ◆ The maximum time allowed for all types of concrete to be delivered to the Site of the Work, including the time required to discharge, shall not exceed one hundred and twenty (120) minutes after batching. Batching of all types of concrete is considered to occur when any of the mix ingredients are introduced into the mixer, regardless of whether or not the mixer is revolving. For concrete that includes silica fume and fly ash, this requirement is reduced to ninety (90) minutes.
 - ◆ Each batch of concrete delivered to the Site shall be accompanied by a time slip issued at the batching plant, bearing the time of batching. In hot or cold weather, or under conditions contributing to quick stiffening of the concrete, a time less than one hundred and twenty (120) and/or ninety (90) minutes may be specified by the Contract Administrator. The Contractor will be informed of this requirement twenty-four (24) hours prior to the scheduled placing of concrete.
 - ◆ To avoid the reduction of delivery and discharge time in hot weather, the Contractor will be allowed to substitute crushed ice for a portion of the mixing water provided the specified water/cementitious ratio is maintained. All of the ice shall be melted completely before discharging any of the concrete at the delivery point.
 - ◆ Unless otherwise noted, no retarders shall be used.
 - ◆ The concrete, when discharged from truck mixers or truck agitators, shall be of the consistency and workability required for the job without the use of additional mixing water.
 - ◆ A record of the actual proportions used for each concrete placement shall be kept by the Supplier and a copy of this record shall be submitted to the Owner upon request.

(iv) Delivery of Concrete

- ◆ The Contractor shall confirm that the Concrete Supplier has sufficient plant capacity and satisfactory transporting equipment to ensure continuous delivery at the rate required. The rate of delivery of concrete during concreting operations shall be such that the development of cold

joints will not occur. The methods of delivering and handling the concrete shall facilitate placing with a minimum of rehandling, and without damage to the structure or the concrete.

(v) Concrete Placement Schedule

- ◆ The Contractor shall submit to the Contract Administrator the proposed concrete placement schedule for all concrete placements for review and approval.
- ◆ The Contractor shall adhere strictly to the concrete placement schedule, as approved by the Contract Administrator.

(c) Preparation for Concreting Against Hardened Concrete

- (i) All hardened concrete against which new concrete is to be placed shall be prepared in the following manner:
- ◆ Concrete shall be removed to sound concrete or to the limits as shown on the Drawings, whichever is greater. The resulting surface shall be roughened by water jet to remove latent cement and miscellaneous debris.
 - ◆ All existing surfaces and exposed reinforcing steel are to be sandblasted to reveal a clean substrate and kept clean until concrete placement. Surface preparation type shall be to ICRI Guideline No. 310.2 CSP 5 (Medium Scarification). Sand-blasting shall be followed by a high pressure water wash to remove all residues.
 - ◆ Immediately prior to placing new concrete, bonding grout shall be thoroughly brushed onto the entire surface of the existing hardened concrete in a thin and even coating that will not run or puddle.

E6.5 Construction Methods

E6.5.1 Debris Containment

- (a) The Contractor shall ensure that all debris including, but not limited to: concrete debris, concrete cutting fluids, formwork debris, and repair materials do not enter the waterway in any way including by the bridge or adjacent roadway drainage systems

E6.5.2 General Curing

- (a) Hot weather curing shall be in accordance with CSA A23.1, refer to E6.5.6 for additional hot weather curing requirements.
- (b) Cold weather curing shall be in accordance with CSA A23.1, refer to E6.5.5 for additional cold weather curing requirements.
- (c) Unformed concrete surfaces shall be covered and kept moist by means of wet polyester blankets for three (3) consecutive days immediately following finishing operations or otherwise approved by the Contract Administrator and shall be maintained at above 10°C for at least seven (7) consecutive days. Construction joints shall only be covered and kept saturated by means of wet polyester curing blankets for the curing period.
- (d) Unformed mortar surfaces shall be covered and kept moist by means of wet polyester blankets for three (3) consecutive days immediately following finishing operations or otherwise approved by the Contract Administrator and shall be maintained at above 10°C for at least seven (7) consecutive days. Construction joints shall only be covered and kept saturated by means of wet polyester curing blankets for the curing period.
- (e) Unformed concrete surfaces shall have curing compound applied immediately after the wet curing period.
- (f) Unformed mortar surfaces do not require application of curing compound after the wet curing period.
- (g) Concrete shall be protected from the harmful effects of sunshine, drying winds, surface dripping, or running water, vibration, and mechanical shock. Concrete shall be

protected from freezing until at least twenty-four (24) hours after the end of the curing period.

- (h) Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3°C in any one hour period or 20°C in any twenty-four (24) hour period.
- (i) Care shall be exercised to ensure that the polyester curing blanket is well drained and that it is placed as soon as the surface will support it without deformation. The Contractor shall ensure that water from the polyester curing blankets does not run into areas where concrete placement and finishing operations are underway. If this occurs, concrete placement shall stop until the problem is corrected satisfactory to the Contract Administrator.

E6.5.3 Form Removal

- (a) All forms for concrete repairs shall remain in place for a minimum of three (3) days. The Contract Administrator must be notified at least twenty-four (24) hours prior to any form removal. The Contractor must receive approval from the Contract Administrator prior to beginning Work.
- (b) All forms for mortar repairs shall remain in place for a minimum of three (3) days. The Contract Administrator must be notified at least twenty-four (24) hours prior to any form removal. The Contractor must receive approval from the Contract Administrator prior to beginning Work.
- (c) The minimum strength of concrete and mortar in place for safe removal of soffit forms for horizontal or inclined members, as well as vertical forms shall be 20 MPa, with the added provisions that the member shall be of sufficient strength to carry safely its own weight, together with superimposed construction loads.
- (d) Field-cured test specimens, representative of the in-place concrete being stripped, may be tested to verify the concrete strength.

E6.5.4 Patching of Formed Surfaces

- (a) Immediately after forms have been removed, but before any repairing or surface finishing is started, the concrete surface shall be inspected by the Contract Administrator. Any repair or surface finishing started before this inspection may be rejected and required to be removed.
- (b) All formed concrete surfaces shall have bolts, ties, struts, and all other timber or metal parts not specifically required for construction purposes cut back 50 mm from the surface before patching.
- (c) Minor surface defects caused by honeycomb, air pockets greater than 5 mm in diameter, and voids left by strutting, and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the area to be patched and then applying patching mortar. A slurry grout consisting of water and cement shall be thoroughly brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck-off slightly higher than the adjacent surface and left for one (1) hour before final finishing to prevent initial shrinkage of the patching mortar and it shall be touched up until it is satisfactory to the Contract Administrator. The patch shall be cured as specified in this Specification, and the final colour shall match the surrounding concrete.
- (d) All objectionable fins, projections, offsets, streaks, or other surface imperfections shall be removed by approved means to the Contract Administrator's satisfaction. Cement washes of any kind shall not be used.
- (e) Concrete shall be cast against forms that will produce plane surfaces with no bulges, indentations, or protuberances other than those shown on the Drawings. The arrangement of panel joints shall be kept to a minimum. Panels containing worn edges, patches, or other defects that will impair the texture of concrete surfaces shall not be used. All fins on the concrete surfaces shall be removed.

E6.5.5 Cold Weather Concreting

- (a) The requirements of this section shall be applied to all concreting operations during cold weather; i.e., if the mean daily temperature falls below 5°C during placing or curing.
- (b) The Contract Administrator will advise the Contractor, in writing, as to the degree of heating of water and aggregates.
- (c) Supplementary equipment, as required below, shall be at the job Site if concrete is likely to be placed in cold weather.
- (d) Formwork and reinforcing steel shall be heated to at least 5°C before concrete is placed.
- (e) The temperature of the concrete shall be maintained at not less than 10°C for seven (7) days or 15°C for five (5) days or 20°C for three (3) days after placing. The concrete shall be kept above freezing temperature for at least a period of seven (7) days. In no case shall the heating be removed until the concrete has reached a minimum compressive strength, which will be specified by the Contract Administrator for Work under construction, and as determined from compressive strength tests for specimens secured under the same conditions as the concrete works in question.
- (f) Aggregates shall be heated to a temperature of not less than 20°C and not more than 65°C. Water shall be heated to a temperature between 55°C and 65°C. The temperature of the concrete at the time of placement shall be within the range specified in CSA A23.1 for the thickness of the section being placed.
- (g) When the mean daily temperature may fall below 5°C, a complete hoarding of the Work, together with supplementary heat, shall be provided.
- (h) When the ambient temperature is below -15°C, the hoarding shall be constructed so as to allow the concrete to be placed without the hoarding having to be opened. If the mixing is done outside of the hoarding, the concrete shall be placed by means of hoppers installed through the hoarding. The hoppers are to be plugged when not in use.
- (i) When the ambient temperature is equal to or above -15°C, the Contractor will be permitted to open small portions of the hoarding for a limited time to facilitate the placing of the concrete.
- (j) Before depositing any of the concrete, the Contractor shall show that enough heating equipment is available to keep the air temperature surrounding the forms within the specified range. This shall be accomplished by bringing the temperature inside of the hoarding to the specified 20°C, at least twelve (12) hours prior to the start of the concrete placing.
- (k) The Contractor shall supply all required heating apparatus and the necessary fuel. When dry heat is used, a means of maintaining atmospheric moisture shall be provided. The relative humidity within the heated enclosure shall be maintained at a minimum of forty percent (40%) during concrete placing and finishing operations. Surface moisture evaporation rates shall not exceed the limits specified in CSA A23.1. Following finishing operations, exposed concrete surfaces shall be protected from excessive drying by applying curing compound, covering the surfaces with polyethylene, or providing water curing.
- (l) Sufficient standby heating equipment must be available to allow for any sudden drop in outside temperatures and any breakdowns which may occur in the equipment.
- (m) Combustion-type heaters may be used if their exhaust gases are vented outside the enclosures and not allowed to come into contact with concrete surfaces. Fire extinguishers must be readily at hand wherever combustion-type heaters are used.
- (n) The Contractor shall keep a curing record of each concrete pour. The curing record shall include: date and location of the pour, mean daily temperature, hoarding relative humidity, temperatures above and below the concrete surface at several points, and notes regarding the type of heating, enclosure, unusual weather conditions, etc. This record shall be available for inspection by the Contract Administrator at the end of the concrete operations.

E6.5.6 Hot Weather Concreting

(a) General

- (i) The requirements of this section shall be applied during hot weather; i.e., air temperatures above 25°C during placing.
- (ii) Concrete shall be placed at as low a temperature as possible, preferably below 15°C, but not above 30°C. Aggregate stockpiles may be cooled by water sprays and sunshades.
- (iii) Ice may be substituted for a portion of the mixing water; providing 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) Sunshades 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 approval 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 then appear in the Mix Design Statement submitted to the Contract Administrator.
- (viii) Curing shall follow immediately after the finishing operations.

(b) Hot-Weather Curing

- (i) When the air temperature is at or above 25°C, curing shall be accomplished by water spray or by using saturated absorptive fabric, in order to achieve cooling by evaporation. Mass concrete shall be water cured for the basic curing period when the air temperature is at or above 20°C, in order to minimize the temperature rise of the concrete.

(c) Job Preparation

- (i) When the air temperature is at or above 25°C, or when there is a probability of it rising to 25°C during the placing period, facilities shall be provided for protection of the concrete in place from the effects of hot and/or drying weather conditions. Under severe drying conditions, as defined in CSA A23.1 the formwork, reinforcement, and concreting equipment shall be protected from the direct rays of the sun or cooled by fogging and evaporation.

(d) Concrete Temperature

- (i) The temperature of the concrete as placed shall be as low as practicable and in no case greater than that shown below for the indicated size of the concrete section.

Thickness of Section (m)	Temperatures, °C	
	Minimum	Maximum
Less than 0.3	10	35
0.3 to 1.0	10	30
1.0 to 2.0	5	25

E6.5.7 Cleanup

- (a) The Contractor shall cleanup equipment and construction debris on at least a daily basis to the satisfaction of the Contract Administrator.

E6.6 Inspection by Contract Administrator

- (a) The following describes the construction hold-points for concrete repairs where approval by the Contract Administrator is required. The Contract Administrator shall inspect all work at the hold-points and provide written authorization for the Contractor to proceed.
- (b) The Contractor shall be responsible for informing the Contract Administrator of the status all works.
- (c) The Contractor shall provide the Contract Administrator with a minimum notice of two (2) working days when inspection shall be required.
- (d) No work shall proceed without written authorization from the Contract Administrator.
- (e) Hold-Points for all concrete repairs are as follows:
 - (i) Prior to any concrete demolition works, the Contract Administrator shall confirm concrete areas to be repaired as noted on the Drawings.
 - (ii) Once all concrete has been removed, the Contract Administrator shall inspect the repair area to confirm the extents of removal and the condition and surface preparation of the existing concrete.
 - (iii) Once all reinforcing steel is in position, the Contract Administrator shall inspect and approved by the Contract Administrator before any new concrete is placed.
- (f) Any work that has proceeded without written authorization may be rejected by the Contract Administrator and shall be removed by the Contractor at his/her own expense.

E6.7 Measurement and Payment

- (a) General
 - (i) The Contractor shall be made aware that the quantities associated with the items of Work specified herein are approximate and will vary based on conditions at the Site. The Contract Administrator will verify all quantities with the Contractor for purposes of payment.

E6.7.1 Supply of concrete shall be considered incidental to the Work and shall be covered under E7 "Traffic Barrier Repairs", E8 "Sidewalk Curb Concrete Repairs", E9 "Bridge Deck Concrete Repairs", E10 "Expansion Joint Repairs", E11 "Southbound Bridge North Abutment Tripping Hazard Repair", E12 "Southbound Bridge South Abutment Pipe Support Repairs", E15 "Full Depth Renewal of Pavement Slabs and joints".

E7. TRAFFIC BARRIER REPAIRS

E7.1 Description

- E7.1.1 This Specification shall cover all operations related to the repair of designated concrete traffic barriers on the Southbound and Northbound Bridges as herein specified.
- E7.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory completion of all Work as hereinafter specified.

E7.2 Scope of Work

- (a) The Work under this Specification shall involve the preparation and repair of concrete and reinforcing steel for:
 - (i) Supplying and placing structural concrete for Type 1 and Type 2 barrier repairs;
 - (ii) Concrete barrier joint repairs;
 - (iii) Removal and reinstallation of existing aluminum balance barrier; and
 - (iv) Removal and salvage of existing aluminum balance barrier.

E7.3 Materials

E7.3.1 General

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

E7.3.2 Materials for Traffic Barrier Repairs

- (a) Repair Concrete
 - (i) The Contractor shall be responsible for supplying Concrete Type C1 and Mortar as per specification E6 "Concrete Repairs".

E7.3.3 EMSEAL Precompressed Foam Barrier Joint Filler

- (a) Barrier joint seals shall be EMSEAL BEJS-ON-A-REEL or equivalent as approved by the Contract Administrator in accordance with B7 "Substitutes".
- (b) The seal width shall be as indicated on the Drawings.
- (c) Sealant system shall be comprised of two (2) components:
 - (i) cellular polyurethane foam impregnated with hydrophobic one hundred percent (100%) acrylic, water-based emulsion, factory coated with highway-grade, fuel resistant silicone; and
 - (ii) field applied silicone adhesive along with field-injected silicone sealant bands.
- (d) Impregnation agent to have proven non-migratory characteristics. Silicone coating to be highway-grade, low-modulus, fuel resistant silicone applied to the impregnated foam sealant at a width greater than maximum allowable joint extension and which when cured and compressed will form a convex curve. Depth of seal as recommended by manufacturer. BEJS foam seal to be installed into manufacturer's standard field-applied silicone mounting beads. The BEJS SYSTEM is to be installed recessed from the surface such that when the field-applied injection band of silicone is installed between the substrates and the foam-and-silicone-convex, the system will be (13 mm) down from the surface, or flush with the barrier joint chamfer.
- (e) Material shall be capable, as a dual seal, of movements of plus fifty percent (+50%) to minus fifty percent (-50%) (one hundred percent (100%) total) of nominal material size. Changes in plane shall be accomplished as per manufacturer's recommendations.
- (f) All substitute candidates to be certified in writing to be free in composition of any waxes or asphalts, wax compounds, or asphalt compounds. All substitute candidates shall be certified in writing to be:
 - (i) Capable of withstanding 65°C for three (3) hours while compressed down to the minimum of movement capability dimension of the basis of design product (minus fifty percent (-50%) of normal material size) without evidence of any bleeding of impregnation medium from the material; and,
 - (ii) That the same material after the heat stability test will self-expand to the maximum of movement capability dimension of the basis-of-design product (plus percent percent (+50%) of nominal material size) within twenty-four (24) hours at room temperature 20°C.

E7.3.4 Rail Post Anchor Bolts

- (a) Rail post anchor bolts shall be 200 mm x 16 mm diameter stainless steel; each complete with one (1) stainless steel hex nut, one (1) stainless steel lock washer, one (1) stainless steel flat washer, and one (1) 50 mm diameter galvanized flat washer with 18 mm diameter hole. The anchor bolts shall be threaded for 65 mm and shall be pre-bent as shown on the Drawings (where applicable). The stainless steel hex head and socket head cap screws shall conform to ASTM A276 type 430 and the dimensional requirements of ANSI B18.3.

E7.3.5 Barrier Joint Dowels

- (a) Dowels and expansion sleeves shall meet or exceed the minimum requirements of ASTM A995M, 300 Series, minimum Grade 420.

E7.4 Equipment

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

E7.5 Construction Methods

(a) General

- (i) The Contractor shall ensure that existing concrete, reinforcing steel, and other existing embedded components that are to remain are not damaged.

E7.5.1 Removal and Reinstallation of Aluminum Balance Barrier

- (a) The existing aluminum balance barrier at all bridge locations with the exception as noted in Specification E7.5.2, shall be removed and re-installed as required to undertake barrier concrete repairs as shown on the Drawings and as described in this Specification.
- (b) The Contractor shall only remove aluminum balance barrier sections and components required to complete the necessary barrier concrete repairs.
- (c) All existing aluminum balance barrier sections and components, with the exception of the existing cast-in-place anchor bolts, shall be re-used and re-installed. During dismantling, removal, storage, and reinstallation operations, the Contractor shall exercise all due care to ensure that the aluminum balance barrier components to be salvaged and reinstalled are not damaged. Any damage to existing components that arises from the Contractor's mishandling of materials shall be corrected and repaired at the Contractor's expense.
- (d) The Contractor shall inspect all components and notify the Contract Administrator of any pre-existing damage prior to removal. Failure to do so will constitute damage done by the Contractor and any repair costs will be born by the Contractor.
- (e) Prior to removal of the existing aluminum balance barrier, the Contractor shall perform a detailed survey of the existing location of the guardrail and posts and shall mark each component for reinstallation. The Contractor shall verify the location of all anchor bolts marked for removal and disposal.
- (f) The Contractor shall clearly label all aluminum balance barrier components that have been removed for re-installation in the same location from where they were removed.
- (g) The Contractor shall field verify existing locations of existing anchor bolts and base plates to ensure that existing aluminum balance barrier sections can be re-installed.
- (h) New base plate anchor bolts shall be cast into the barrier repair concrete. The Contractor shall create and utilize an anchor bolt template matching the layout and spacing of the existing base plates.
- (i) There will be no additional compensation considered for existing aluminum balance barrier sections that cannot be re-installed based on incorrect placement of new aluminum balance barrier anchor bolts.

E7.5.2 Removal and Salvage of Aluminum Balance Barrier

- (a) The existing aluminum balance barrier on the Northbound Bridge East (curb) Barrier adjacent to the sidewalk shall be removed along the entire length of the bridge, salvaged, and delivered to the City's Storage Site at the following address:
 - (i) City of Winnipeg – Public Works Yard at 960 Thomas Avenue, Winnipeg, Manitoba
- (b) Existing anchor bolts shall be cut and ground smooth with the top surface of the concrete barrier after removal of aluminum balance barrier.
- (c) During dismantling, removal, and transportation operations, the Contractor shall exercise all due care to ensure that the aluminum balance barrier components are not damaged.

E7.5.3 Type 1A and 1B – Concrete Barrier Repairs

- (a) The sawcut perimeter of area to be repaired shall be a minimum depth of 20 mm. Mechanically remove unsound concrete to the limits shown on the Drawings or to the depth of unsound concrete, whichever is greater. Remove at least 30 mm of existing concrete facing, even if not delaminated, and continue removal as required to expose sound concrete.
- (b) Where reinforcing steel with active corrosion is encountered, comply with the following:
 - (i) Where half or greater of the diameter of the reinforcing steel is exposed, chip out behind the reinforcing to a 20 mm minimum depth;
 - (ii) Wire brush reinforcing steel and concrete to remove rust and contaminants; and
 - (iii) Splice new reinforcing steel to existing steel where corrosion has depleted the cross-section area by twenty-five percent (25%), as directed by the Contract Administrator.
- (c) Clean all existing concrete surfaces that will be in contact with the repair concrete to remove all deleterious substances.
- (d) The Contractor is responsible to create a bond between the new mortar/concrete and the existing substrates. The Contract Administrator will check all repaired areas for bond using a hammer "sounding" method after form removal.
- (e) Apply bonding grout or epoxy grout to all existing concrete surfaces that will be in contact with the repair material.
- (f) Place mortar by trowelling, pumping, or into forms ensuring that all entrapped air is removed. The use of Type C1 Concrete will only be permitted for Type 1B Concrete Barrier Repairs when the concrete for the repair area has been removed to 20 mm behind the existing reinforcing steel.
- (g) Cure in accordance with E6.5.2.

E7.5.4 Type 2A and 2B – Concrete Barrier Repairs

- (a) Remove all of the affected deteriorated concrete volume by saw cutting and removing the affected portion of the barrier to the dimensions shown on the Drawings.
- (b) Install reinforcing steel into predrilled holes and place reinforcing steel as follows:
 - (i) Drill holes into adjacent concrete of the diameters and depths shown on the Drawings. Drill bits shall have a diameter no larger than 2 mm larger than the bar diameter;
 - (ii) Holes shall be located to the correct depth and alignment as indicated on the Drawings;
 - (iii) Drilling equipment shall be operated so as to ensure that no damage to the concrete results from such drilling operation. Coring of holes is not permitted. In the event that existing reinforcing steel bars are hit during the drilling operations, that hole shall be abandoned and a new hole shall be drilled nearby to the correct depth. All abandoned holes shall be filled with non-shrink grout or approved adhesive agent;
 - (iv) Holes for reinforcing steel bars shall be blown clean with compressed air. Approved adhesive agent shall be placed in the back of the drilling hole. The reinforcing bars shall be worked back into the holes for complete coverage around the portion of the bar that extends into the hole, such that adhesive agent is squeezed from the hole;
 - (v) Install reinforcing steel bars as shown on the Drawings; and
 - (vi) Once all reinforcing steel is in position, the Contract Administrator shall inspect and approve by the Contract Administrator before any new concrete is placed. Otherwise, the concrete may be rejected by the Contract Administrator and shall be removed by the Contractor at his/her own expense.
- (c) Supply new traffic barrier rail post anchor bolts as shown on the Drawings.

- (d) Clean all existing concrete surfaces that will be in contact with the repair concrete to remove all deleterious substances.
- (e) Apply bonding grout or epoxy bonding agent to all existing concrete surfaces that will be in contact with the repair mortar.
- (f) Place Type C1 Concrete into forms.
- (g) Cure in accordance with E6.5.2.

E7.5.5 Concrete Barrier Joint Repairs

- (a) Barrier Joint Seals
 - (i) Remove existing joint seals where replacement is indicated on the Drawings.
 - (ii) Clean all concrete surfaces as required by the seal manufacturer's instructions.
 - (iii) Install the EMSEAL Precompressed Foam Joint Filler in accordance with the manufacturer's recommendations.
- (b) Barrier Joint Dowels
 - (i) Barrier joint dowels shall be installed as required where Type 2A and Type 2B Concrete Barrier Repairs occur at a barrier joint.
 - (ii) Install barrier joint dowels into predrilled holes as follows:
 - ◆ drill holes into adjacent concrete of the diameters and depths shown on the Drawings. Drill bits shall have a diameter no larger than 2 mm larger than the bar diameter;
 - ◆ holes shall be located to the correct depth and alignment as indicated on the Drawings;
 - ◆ drilling equipment shall be operated so as to ensure that no damage to the concrete results from such drilling operation. Coring of holes is not permitted. In the event that existing reinforcing steel bars are hit during the drilling operations, that hole shall be abandoned and a new hole shall be drilled nearby to the correct depth. All abandoned holes shall be filled with non-shrink grout or approved adhesive agent;
 - ◆ holes for barrier joint dowels bars shall be blown clean with compressed air. Approved adhesive agent shall be placed in the back of the drilling hole. The reinforcing bars shall be worked back into the holes for complete coverage around the portion of the bar that extends into the hole, such that adhesive agent is squeezed from the hole;
 - ◆ install reinforcing steel bars as shown on the Drawings;

E7.5.6 The Contract Administrator shall inspect the Work in accordance with Specification E6.6 "Inspection by Contract Administrator".

E7.6 Measurement and Payment

E7.6.1 Type 1A Concrete Barrier Repairs

- (a) Type 1A Concrete Barrier Repairs will be measured on a unit basis and paid for at the Contract Unit Price per square metre for "Type 1A Concrete Barrier Repairs", repaired in accordance with this Specification and accepted by the Contract Administrator.

E7.6.2 Type 1B Concrete Barrier Repairs

- (a) Type 1B Concrete Barrier Repairs will be measured on a unit basis and paid for at the Contract Unit Price per square metre for "Type 1B Concrete Barrier Repairs", repaired in accordance with this Specification and accepted by the Contract Administrator.

E7.6.3 Type 2A Concrete Barrier Repairs

- (a) Type 2A Concrete Barrier Repairs will be measured on a unit basis and paid for at the Contract Unit Price per linear metre for "Type 2A Concrete Barrier Repairs", repaired in accordance with this Specification and accepted by the Contract Administrator.

E7.6.4 Type 2B Concrete Barrier Repairs

- (a) Type 2B Concrete Barrier Repairs will be measured on a unit basis and paid for at the Contract Unit Price per linear metre for “Type 2B Concrete Barrier Repairs”, repaired in accordance with this Specification and accepted by the Contract Administrator.
- E7.6.5 Concrete Barrier Joint Repairs
 - (a) Barrier Joint Repairs will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Concrete Barrier Joint Repairs”, repaired in accordance with this Specification and accepted by the Contract Administrator.
- E7.6.6 Removal and Reinstallation of Aluminum Balance Barrier
 - (a) Removal and Reinstallation of Aluminum Balance Barrier will not be measured and will be considered incidental to the following work items:
 - (i) Type 1A and 1B Concrete Barrier Repairs;
 - (ii) Type 2A Concrete Barrier Repairs; and
 - (iii) Type 2B Concrete Barrier Repairs.
- E7.6.7 Removal and Salvage of Aluminum Balance Barrier
 - (a) Removal and Salvage of Aluminum Balance Barrier will be measured on a lump sum basis and paid for at the Contract Unit Price for “Removal and Salvage of Aluminum Balance Barrier”, repaired in accordance with this Specification and accepted by the Contract Administrator.
- E7.6.8 Supply and Installation of Rail Post Anchor Bolts
 - (a) Supply and Installation of Rail Post Anchor Bolts will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Supply and Installation of Rail Post Anchor Bolts”, repaired in accordance with this Specification and accepted by the Contract Administrator.
- E7.6.9 Supply and Installation of Barrier Joint Dowels
 - (a) Supply and Installation of Barrier Joint Dowels will be measured on a unit basis and paid for at the Contract Unit Price per unit for “Supply and Installation of Barrier Joint Dowels”, repaired in accordance with this Specification and accepted by the Contract Administrator.

E8. SIDEWALK CURB CONCRETE REPAIRS

E8.1 Description

E8.1.1 This Specification shall cover the sidewalk curb repairs as specified herein.

E8.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work hereinafter specified.

E8.2 Scope of Work

- (a) The Work under this Specification shall involve the preparation and repair of concrete and reinforcing steel for:
 - (i) Southbound Bridge North and South Approach Curb Repairs;
 - (ii) Southbound Bridge Curb Repairs; and
 - (iii) Northbound Bridge Curb Repairs

E8.3 Referenced Specifications and Drawings

- (a) CW 3520 – Seeding; and
- (b) E6 - Concrete Repairs;

E8.4 Materials

E8.4.1 General

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

E8.4.2 Repair Concrete

- (a) Concrete for repairs shall be in accordance with Specification E6 "Concrete Repairs"

E8.4.3 Bond Agents

- (a) Bonding agents shall be in accordance with Specification E6 "Concrete Repairs"

E8.4.4 Curing Compound

- (a) Curing compounds shall be in accordance with Specification E6 "Concrete Repairs"

E8.4.5 Field Applied Galvanizing

- (a) All field applied galvanized coatings shall be applied in accordance with ASTM A780M.
- (b) Further to ASTM A780M, paints used for field applied galvanizing shall contain zinc dust above ninety-two percent (92%) in the dried film.
- (c) At least seven (7) days prior to any field applied galvanizing, the Contract shall submit the galvanizing product and application details to the Contract Administrator for review.
- (d) Spray applied field galvanizing will not be permitted. Where restrictions occur that brush applied field galvanizing is not possible, spray applied field galvanizing may be permitted if accepted in writing by the Contract Administrator prior to application.
- (e) All field applied galvanized coatings shall be applied in accordance with the manufacturer's recommendations and as directed by the Contract Administrator.

E8.5 Equipment

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

E8.6 Construction Methods

E8.6.1 Concrete Removals

- (a) Remove pedestrian handrail sections as noted on the Drawings or as required in order to complete the necessary concrete repairs.
- (b) Mechanically remove unsound concrete to the limits indicated on the Drawings or to the depth of unsound concrete, whichever is greater.
- (c) Where reinforcing steel with active corrosion is encountered, comply with the following:
 - (i) If half or greater of the diameter of the reinforcing steel is exposed, chip out behind the reinforcing to a 20 mm minimum depth;
 - (ii) Wire brush reinforcing steel and concrete to remove rust and contaminants; and
 - (iii) Splice new reinforcing steel to existing steel where corrosion has depleted the cross-section area by twenty-five percent (25%), as directed by the Contract Administrator.
- (d) Southbound Bridge North and South Approach Curb Repairs:
 - (i) Following concrete removals at the north and south abutment concrete curb repairs, apply touch up galvanizing on the sidewalk expansion joint extrusion and pedestrian handrail, base plate, and anchors exposed during concrete removals.

E8.6.2 Placing Concrete

- (a) Clean all existing concrete surfaces that will be in contact with the repair concrete to remove all deleterious substances.
- (b) The Contractor is responsible to create a bond between the new mortar and the existing substrates. The Contract Administrator will check all repaired areas for bond using a hammer "sounding" method after form removal.
- (c) Apply bonding agent to all existing concrete surfaces that will be in contact with the repair mortar.
- (d) Place mortar by trowelling, pumping, or into forms ensuring that all entrapped air is removed.
- (e) At the Southbound north approach curb repair, the top of the concrete curb shall be raised to eliminate the vertical offset between handrail sections over the expansion joint. The Contractor shall field measure and verify the height difference, and after reinstallation of the pedestrian handrail, the difference shall be no greater than $\pm 5\text{mm}$.
- (f) Cure in accordance with E6.5.2.
- (g) Reinstall pedestrian handrail sections.

E8.6.3 Landscaping and Regrading

- (a) For Southbound Bridge North and South Approach Curb Repairs, existing embankment topsoil will need to be excavated to expose the full height of the exterior face of the approach slab curb to facilitate concrete repairs.
- (b) Following concrete repair works as specified in this Specification, the embankment shall be regraded so that a minimum of 100mm of the approach slab curb is below grade.
- (c) Seeding of all areas damaged during concrete repairs shall be done in accordance with City Specification CW 3520.
- (d) The Contractor shall be made aware that at both Southbound Bridge North and South Abutments, erosion of the existing embankment has exposed the underside of the approach slab. Regrading of the embankment as specified herein is required and will be considered as part of this Work.
- (e) Excavation, regrading, and seeding operations will not be measured and will be considered incidental to Southbound Bridge North and South Approach Curb Repairs.

E8.6.4 The Contract Administrator shall inspect the Work in accordance with Specification E6.6 "Inspection by Contract Administrator".

E8.7 Measurement and Payment

E8.7.1 Southbound Bridge North and South Approach Curb Repairs

- (a) Southbound Bridge North and South Approach Curb Repairs will be measured on a unit basis and paid for at the Contract Unit Price per unit cost for "Southbound Bridge North and South Approach Curb Repairs", repaired in accordance with this Specification and accepted by the Contract Administrator.

E8.7.2 Bridge Curb Repairs

- (a) Bridge Curb Repairs will be measured on a unit basis and paid for at the Contract Unit Price per square metre for "Bridge Curb Repairs", repaired in accordance with this Specification and accepted by the Contract Administrator.

E9. BRIDGE DECK CONCRETE REPAIRS

E9.1 Description

- (a) This Specification shall cover all operations relating to the repair of designated bridge deck and approach slab delamination and surface defect areas on the Northbound and Southbound Bridges as herein specified.

- (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.

E9.2 Scope of Work

- (a) The Work under this Specification shall involve the preparation and repair of concrete and reinforcing steel for:
 - (i) Bridge Deck and Approach Slab Delaminations.

E9.3 Materials

E9.3.1 General

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

E9.3.2 Concrete

- (a) Concrete for Bridge Deck Concrete Repairs shall be of Type C1 Concrete and shall be supplied and installed in accordance with Specification E6 "Concrete Repairs".

E9.4 Equipment

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

E9.5 Construction Methods

E9.5.1 Delamination Repair Type 1A and 1B

- (a) Sawcut perimeter of area to be repaired to a minimum depth of 20 mm. Mechanically remove unsound concrete to the limits indicated on the Drawings or to the depth of unsound concrete, whichever is greater. Remove at least 30 mm of existing concrete facing, even if not delaminated, and continue removal as required to expose sound concrete.
- (b) Where reinforcing steel with active corrosion is encountered, comply with the following:
 - (i) if half or greater of the diameter of the reinforcing steel is exposed, chip out behind the reinforcing to a 20 mm minimum depth;
 - (ii) wire brush reinforcing steel and concrete to remove rust and contaminants. Field epoxy-coat all exposed reinforcing; and
 - (iii) splice new reinforcing steel to existing steel where corrosion has depleted the cross-section area by twenty-five percent (25%), as directed by the Contract Administrator.
- (c) Clean all existing concrete surfaces that will be in contact with the repair concrete to remove all deleterious substances.
- (d) The Contractor is responsible to create a bond between the new concrete and the existing substrates. The Contract Administrator will check all repaired areas for bond using a hammer "sounding" method after form removal.
- (e) Apply bonding grout or epoxy grout to all existing concrete surfaces that will be in contact with the repair concrete.
- (f) Place repair concrete and cure in accordance with E6.

E9.5.2 The Contract Administrator shall inspect the Work in accordance with Specification E6.6 "Inspection by Contract Administrator".

E9.6 Measurement and Payment

E9.6.1 Delamination Repair Type 1A

- (a) Delamination Repair Type 1A will be measured on a unit basis and paid for at the Contract Unit Price per square metre for "Delamination Repairs Type 1A", repaired in accordance with this Specification and accepted by the Contract Administrator.

E9.6.2 Delamination Repair Type 1B

- (a) Delamination Repair Type 1B will be measured on a unit basis and paid for at the Contract Unit Price per square metre for "Delamination Repairs Type 1B", repaired in accordance with this Specification and accepted by the Contract Administrator.

E10. EXPANSION JOINT REPAIRS

E10.1 Description

E10.1.1 This Specification shall cover expansion joint repairs that will include the installation precompressed foam joint filler, the repair of steel expansion joint extrusions, and repairs to expansion joint concrete blockouts as specified herein.

E10.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work hereinafter specified.

E10.2 Scope of Work

- (a) Installation of new preformed neoprene joint seal at the Southbound Bridge south abutment expansion joint.
- (b) Installation of EMSEAL BEJS new precompressed foam joint filler at Northbound Bridge expansion joints.
- (c) Expansion joint steel extrusion repairs at Southbound and Northbound Bridges.
- (d) Expansion Joint Concrete Blockout Repair at Northbound Bridge.
- (e) Damaged Barrier Extrusion Angle Repairs at Northbound Bridge.

E10.3 Referenced Specifications and Drawings

- (a) CW 3410

E10.4 Materials

E10.4.1 General

- (a) The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.
- (b) All materials supplied under this Specification shall be of a type acceptable to by the Contract Administrator, and shall be subject to inspection and testing by the Contract Administrator.

E10.4.2 Preformed Neoprene Joint Seals

- (a) The expansion joint shall be an equivalent to WaboCrete SE-500 StripSeal, as specified in the Drawings, and supplied by Watson Bowman Acme Corp., or equal as accepted by the Contract Administrator in accordance with Specification B7 "Substitutes".
- (b) Preformed joint seal shall be manufactured from a neoprene rubber.
- (c) The preformed neoprene rubber joint seal shall meet the requirements of ASTM D395 and Ontario Provincial Standard Specification (OPSS) 1210 "Material Specification for Preformed Neoprene Joint Seals," latest edition, and as amended herein; and of Table 1 of this Specification. All tests will be made on specimens prepared from the extruded seals.
- (d) The seals at each joint shall be supplied in one continuous piece, separate from the steel extrusions or joint. No shop or field splicing will be allowed in the seals.

- E10.4.3 Steel for Expansion Joint Extrusion Repairs
- (a) The existing extrusions at the Northbound Bridge are Elastometal Type “A” Extrusion.
 - (b) The existing extrusions at the Southbound Bridge are WaboStripSeal Type “A” Extrusion.
 - (c) Repair steel for extrusions shall conform to CSA G40.21M, Grade 230G minimum.
 - (d) Repair steel for extrusions shall be hot dip galvanized.
- E10.4.4 Steel for Barrier Extrusion Angle Repairs at Northbound Bridge
- (a) The existing barrier extrusions at the Northbound Bridge are Elastometal Type “A” Extrusion.
 - (b) Repair steel for extrusions shall conform to CSA G40.21M, Grade 230G minimum.
 - (c) Repair steel for extrusions shall be galvanized in accordance with CAN/CSA G164-M92, to a minimum net retention of 610 g/m².
- E10.4.5 EMSEAL BEJS Precompressed Foam Joint Filler
- (a) The City will supply EMSEAL BEJS precompressed foam joint filler for the Contractor to install at all locations as shown on the Drawings.
 - (b) In accordance with D28, the Contractor shall be responsible for collecting the EMSEAL BEJS precompressed foam joint filler from the City’s Storage Site at the following address:
 - (i) City of Winnipeg – Public Works Yard at 960 Thomas Avenue, Winnipeg, Manitoba.
- E10.4.6 Concrete at Expansion Joint Repairs
- (a) Concrete for the expansion joint extrusion repair shall be in accordance with Specification E6 “Concrete Repairs”.
 - (b) Concrete for the associated barrier repairs at the expansion joints shall be in accordance with Specification E6 “Concrete Repairs”.
- E10.4.7 Touch-up Galvanizing
- (a) Field Applied Galvanizing
 - (i) All field applied galvanized coatings shall be applied in accordance with ASTM A780M.
 - (ii) Further to ASTM A780M, paints used for field applied galvanizing shall contain zinc dust above ninety-two (92%) in the dried film.
 - (iii) At least seven (7) days prior to any field applied galvanizing, the Contract shall submit the galvanizing product and application details to the Contract Administrator for review.
 - (iv) Spray applied field galvanizing will not be permitted. Where restrictions occur that brush applied field galvanizing is not possible, spray applied field galvanizing may be permitted if accepted in writing by the Contract Administrator prior to application.
 - (v) All field applied galvanized coatings shall be applied in accordance with the manufacturer’s recommendations and as directed by the Contract Administrator.
- E10.4.8 Asphaltic Concrete
- (a) Type 1A asphaltic concrete and all required other materials shall be as specified in CW 3410.
- E10.5 Equipment
- E10.5.1 All equipment shall be of a type acceptable to the Contract Administrator and shall be kept in good working order.

E10.6 Construction Methods

E10.6.1 Removal of Existing EMSEAL Joint

- (a) At the Southbound Bridge south abutment expansion joint, a temporary EMSEAL BEJS precompressed foam joint filler was installed to replace the damaged strip seal expansion joint.
- (b) Removal shall occur on a lane-by-lane basis in accordance with the traffic control requirements.
- (c) The existing EMSEAL joint shall be removed prior to installation of new preformed neoprene joint seal. The Contractor shall clean of any remaining adhesive or bonding agent from the EMSEAL as confirmed by the Engineer.
- (d) Removal of the existing EMSEAL joint shall be considered incidental to "Supply and Installation of Neoprene Preformed Joint Seal" and no separate payment shall be made for this work.

E10.6.2 Removal and Replacement of Asphaltic Concrete

- (a) Sawcut the perimeter of the area to be repaired.
- (b) Confirm that existing asphaltic pavement at extents of repair is firmly bonded to approach slab concrete. If asphalt pavement has debonded, the limits of repair shall be extended as approved by the Contract Administrator.
- (c) Preparation of existing concrete pavement shall be done in accordance with 9.1.2(b) of Specification CW 3410.
- (d) Construction of asphalt patching shall be performed in accordance with 9.4 of Specification CW 3410.
- (e) Measurement and payment for the removal and replacement of asphaltic concrete shall be in accordance with Specification E14 "Bridge Approach Asphalt Patching".

E10.6.3 Concrete Removals for Expansion Joints

- (a) Remove concrete to the limits shown on the Drawings. The maximum sawcut depth shall be twenty-five (25) mm. The Contractor shall take all necessary precautions to ensure that no sound concrete located beyond the required dimensions of removal is damaged or removed. Any damage caused to sound concrete or reinforcing steel beyond the required limit of removal or excessive removal of concrete beyond the required dimensions of removal by the Contractor during any demolition procedure, will be repaired by the Contractor at the Contractor's expense to the satisfaction of the Contract Administrator.

E10.6.4 Removal of Existing Expansion Joint Seals

- (a) Remove the existing expansion joint seals at the locations indicated on the drawings. Removals shall occur on a lane-by-lane basis in accordance with the traffic control requirements.

E10.6.5 Expansion Joint Extrusion Repair

- (a) Damaged steel as noted on the Drawings and confirmed with the Contract Administrator are to be repaired by cutting out the damaged steel and replacing it with new steel section in accordance with the Drawings. Welding shall be done in accordance with CSA W59, "Welded Steel Construction." Coat all welds after installation with field-applied galvanizing. Place repair concrete as specified.

E10.6.6 Galvanizing Touch-up Prior to Placement of Concrete

- (a) Any extrusion areas of damaged galvanizing and field welds are to receive Galvalloy touch-up galvanizing.
 - (i) Surfaces to receive Galvalloy field-applied galvanizing shall be cleaned using a wire brush, a light grinding action, or mild blasting to remove loose scale, rust, paint, grease, dirt, or other contaminants. Preheat the surface to 315°C and wire brush the surface during preheating. Rub the cleaned preheated area with

the repair stick to deposit an evenly distributed layer of zinc alloy. Spread the alloy with a wire brush, spatula, or similar tool. Field-applied galvanizing shall be blended into existing galvanizing of surrounding surfaces and shall be buffed and polished if required to match the surrounding surfaces. Care shall be taken to not overheat surfaces beyond 400°C and to not apply direct flame to the alloy rods.

(ii) The process is to be repeated as required to achieve a thickness comparable to original galvanizing.

(b) All other areas of damaged galvanizing and field welds are to receive field applied galvanizing.

E10.6.7 Repair Concrete Placement

(a) Concrete shall be placed in accordance with Specification E6 "Concrete Repairs".

(b) Trowel concrete smooth and flush with the extrusion top plate and sound concrete at edge of concrete removal area.

E10.6.8 Installation of Preformed Neoprene Joint Seals

(a) The seal at each expansion joint unit shall be installed as one continuous piece after completion of all concreting operations, to the satisfaction of the Contract Administrator, and shall not be installed prior to casting of the expansion joints into the concrete.

(b) The existing extrusion angles and locking lip shall be cleaned of all deleterious material, including but not limited to concrete, rust, and adhesives prior to installing new preformed neoprene joint seals.

(c) Installation of preformed neoprene joint seals shall not occur until all expansion joint extrusion repairs are completed in accordance with E10.6.5.

E10.6.9 Installation of EMSEAL BEJS precompressed foam joint filler

(a) Prior to installation of EMSEAL BEJS the Contractor shall prepare the substrates in accordance with manufacturer's recommendations.

(b) Existing extrusion angle locking lip shall be filled with a non-sag epoxy as approved by the manufacturer of EMSEAL BEJS.

(c) The EMSEAL joint filler at each expansion joint unit shall be installed so as to minimize the number of field joints, to the satisfaction of the Contract Administrator, and shall not be installed prior to casting of the expansion joints into the concrete.

(d) Care shall be taken not to damage the new EMSEAL joint filler during the installation process. Damaged seal shall be replaced by the Contractor at their expense. Repair techniques may be considered subject to the approval of the Contract Administrator.

(e) The EMSEAL joint filler shall be installed in accordance with the manufacturer's recommendations.

E10.6.10 Installation of Concrete Barrier EMSEAL BEJS

(a) Install the seal in accordance with the manufacturer's recommendations.

E10.6.11 Damaged Barrier Extrusion Angle Repair

(a) All barrier extrusion angle repairs shall be performed in a manner so as not to damage the existing barrier expansion joint seal. Any damage to the existing seal by will be repaired by the Contractor at the Contractor's expense to the satisfaction of the Contract Administrator.

(b) Remove concrete behind damaged barrier extrusion angle sufficiently to repair damaged extrusion angle. Sawcut 25mm around perimeter of repair area as shown on the Drawings.

(c) Cut out damaged section of barrier extrusion angle and cover plates.

(d) Install repair section of barrier expansion joint extrusion angle and cover plate by field welding in accordance with CSA W59, "Welded Steel Construction."

- (e) The exposed portion of the barrier extrusion angle shall be cleaned to remove any deleterious material, including corrosion, dirt and debris, and hardened concrete.
- (f) Coat all welds after installation with field-applied galvanizing.
- (g) The Contract Administrator shall inspect the repaired barrier cover plate prior to placing any repair concrete.
- (h) Repair concrete barrier sections associated with expansion joint replacement as specified in E7.5.3.

E10.6.12 The Contract Administrator shall inspect the Work in accordance with Specification E6.6 "Inspection by Contract Administrator".

E10.7 Quality Control

E10.7.1 General

- (a) All workmanship and all materials furnished and supplied under this Specification are subject to the close and systematic inspection and testing by the Contract Administrator including all 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 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.

E10.7.2 Preformed Neoprene Joint Seals

(a) Joint Seal Markings

- (i) All joint seals shall be identified as to the manufacturer by means of a continuous permanent mould mark. The mould marks shall be registered with the Contract Administrator and shall be used on all seals produced by the respective manufacturer. The seal shall also be permanently marked, on the side of the seal, with the date of production and the batch/lot, at intervals of not more than 1.2 m.
- (ii) The Contractor shall supply to the Contract Administrator a summary of the seals identifying the date of manufacture, the batch/lot, and the proposed installation location.

(b) Samples and Testing Procedures

- (i) The Contractor shall supply seal sample material at no charge to The City for quality control testing purposes. The samples will each be 1.5 m long. Each sample will represent not more than three expansion joint seals of the same size, lot, and make and shall be continuous with same until sampled by the Contract Administrator. As soon as the seals to be used in the joint assemblies have been manufactured, they shall be available to the Contract Administrator for sampling.
- (ii) Testing procedures will be in accordance with the latest revisions of the methods indicated on Table 1, Physical Requirements.
- (iii) All materials failing to meet the Specification requirements will be rejected.
- (iv) Lots rejected may be culled by the supplier and, upon satisfactory evidence of compliance with the Specifications, will be accepted.

Table 1

Property	Physical Requirements	Test Procedure*
1. Tensile Strength	Minimum 13.5 MPa	ASTM D412 OPSS 1210.07.03.01.02
2. Elongation at Break	Minimum 250%	ASTM D412 OPSS 1210.07.03.01.02
3. Hardness, Type A Durometer	55: +5 Points -5 Points	ASTM D2240 Modified OPSS 120.07.03.01.03

4. Oven aging Test 70 Hours at 100 C Reduction in Tensile Strength Reduction in Elongation Increase in Hardness	Maximum 20% Maximum 20% Maximum 10 Points	ASTM D573
5. Permanent Set at Break	Maximum 10%	ASTM D412
6. Low Temperature Stiffening Hardness, Type A Durometer	Maximum 15 Points	ASTM D2240 OPSS 1210.07.03.01.03
7. Oil Swell, ASTM Oil No. 3 70 H at 40 C (wipe with toluene to remove surface contamination)	45%	ASTM D471
8. **Safe Compressibility Test (Z min.) Bridge Seal - < 63.5 mm > 63.5 mm	Minimum 50% Minimum 55%	OPSS 1210.07.03.01.04
9. **Pressure Generation at 15% Deflection	Minimum 20 kPa	OPSS 1210.07.03.01.04
10. **Recovery 22 h at -28 C 70 h at -10 C 70 h at +100 C	Minimum 80% No Cracking Minimum 88% Splitting or Minimum 85% Sticking	OPSS 1210.07.03.01.05

* ASTM - American Society for Testing and Materials

OPSS - Ontario Provincial Standard Specification

** This physical requirement not applicable to lock-in type joint seals

E10.8 Shop Drawings

- (a) Shop drawings shall be provided in accordance with Specification B7, "Substitutes" for the following work items:
- (i) Damaged Barrier Extrusion Angle Repair; and
 - (ii) Southbound Bridge Steel Extrusion Plate Addition.

E10.9 Measurement and Payment

E10.9.1 Supply and Installation of Preformed Neoprene Joint Seal

- (a) Supply and Installation of Preformed Neoprene Joint Seal will be measured on a unit basis and paid for at the Contract Unit Price per linear meter for "Supply and Installation of Neoprene Preformed Joint Seal", repaired in accordance with this Specification and accepted by the Contract Administrator.

E10.9.2 Installation of EMSEAL Foam Joint Filler

- (a) Installation of EMSEAL Foam Joint Filler will be measured on a unit basis and paid for at the Contract Unit Price per linear meter for "Installation of EMSEAL Foam Joint Filler", repaired in accordance with this Specification and accepted by the Contract Administrator.

E10.9.3 Expansion Joint Extrusion Repairs

- (a) Expansion Joint Extrusion Repairs will be measured on a unit basis and paid at the Contract Unit Price per linear metre for "Expansion Joint Extrusion Repairs", repaired in accordance with this Specification and accepted by the Contract Administrator.

E10.9.4 Expansion Joint Blockout Repairs

- (a) Expansion Joint Blockout Repairs will be measured on a unit basis and paid at the Contract Unit Price per square metre for “Expansion Joint Blockout Repairs”, repaired in accordance with this Specification and accepted by the Contract Administrator.

E10.9.5 Damaged Barrier Extrusion Angle Repairs

- (a) Damaged Barrier Extrusion Angle Repairs will be measured on a unit basis and paid at the Contract Unit Price per unit for “Damaged Barrier Extrusion Angles Repairs”, repaired in accordance with this Specification and accepted by the Contract Administrator.

E11. SOUTHBOUND BRIDGE NORTH ABUTMENT TRIPPING HAZARD REPAIR

E11.1 Description

- (a) This Specification covers all items related to the repairs to the Southbound Bridge north abutment tripping hazard repair as indicated 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 things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E11.2 Materials

- (a) Concrete
 - (i) Shall be in accordance with E6 “Concrete Repairs”
- (b) Steel Shim Plate
 - (i) Repair steel for shim plate shall conform to CSA G40.21M, Grade 230G minimum.
- (c) Field Applied Galvanizing
 - (i) All field applied galvanized coatings shall be applied in accordance with ASTM A780M.
 - (ii) Further to ASTM A780M, paints used for field applied galvanizing shall contain zinc dust above ninety-two percent (92%) in the dried film.
 - (iii) At least seven (7) days prior to any field applied galvanizing, the Contract shall submit the galvanizing product and application details to the Contract Administrator for review.
 - (iv) Spray applied field galvanizing will not be permitted. Where restrictions occur that brush applied field galvanizing is not possible, spray applied field galvanizing may be permitted if accepted in writing by the Contract Administrator prior to application.
 - (v) All field applied galvanized coatings shall be applied in accordance with the manufacturer’s recommendations and as directed by the Contract Administrator.

E11.3 Construction Methods

- (a) Concrete Removal
 - (i) Sawcut to limits shown on the Drawings.
 - (ii) Remove all concrete within repair limits.
 - (iii) Clean existing expansion joint flat plate and prepare for welding. Welding shall be done in accordance with CSA W59, “Welded Steel Construction.”
 - (iv) The Contractor shall be responsible for measuring, verifying, and fabricating the new steel shim plate in order provide no more than a 5mm height difference compared to the existing sidewalk cover plate when measured across the width of the expansion joint.
 - (v) Weld new steel shim plate to existing expansion joint flat plate.
 - (vi) Galvanize all expansion joint steel within the repair area.
 - (vii) Place repair concrete.

E11.3.1 The Contract Administrator shall inspect the Work in accordance with Specification E6.6 "Inspection by Contract Administrator".

E11.4 Measurement and Payment

- (a) Southbound Bridge North Abutment Tripping Hazard Repair will not be measured. This item of Work will be paid for at the Contract Lump Sum Price for "Southbound Bridge North Abutment Tripping Hazard", performed in accordance with the Specification and accepted by the Contract Administrator.

E12. SOUTHBOUND BRIDGE SOUTH ABUTMENT PIPE SUPPORT REPAIRS

E12.1 Description

- (a) This Specification covers all items related to the Southbound Bridge South Abutment Pipe Support Repairs as indicated 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 things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E12.2 Materials

E12.2.1 General

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

E12.2.2 Concrete

- (a) Concrete for Southbound bridge South Abutment Pipe Support Repairs shall be of Type C1 Concrete and shall be supplied and installed in accordance with Specification E6 "Concrete Repairs".
- (b) Field Applied Galvanizing
 - (i) All field applied galvanized coatings shall be applied in accordance with ASTM A780M.
 - (ii) Further to ASTM A780M, paints used for field applied galvanizing shall contain zinc dust above ninety-two percent (92%) in the dried film.
 - (iii) At least seven (7) days prior to any field applied galvanizing, the Contract shall submit the galvanizing product and application details to the Contract Administrator for review.
 - (iv) Spray applied field galvanizing will not be permitted. Where restrictions occur that brush applied field galvanizing is not possible, spray applied field galvanizing may be permitted if accepted in writing by the Contract Administrator prior to application.
 - (v) All field applied galvanized coatings shall be applied in accordance with the manufacturer's recommendations and as directed by the Contract Administrator.

E12.3 Construction Methods

- (a) The Contractor shall be responsible for supporting the pipe during repair operations.
- (b) Sawcut perimeter of area to be repaired to a minimum depth of 20 mm. Mechanically remove unsound concrete to the limits indicated on the Drawings or to the depth of unsound concrete, whichever is greater. Remove at least 30 mm of existing concrete facing, even if not delaminated, and continue removal as required to expose sound concrete.
- (c) Where reinforcing steel with active corrosion is encountered, comply with the following:
 - (i) if half or greater of the diameter of the reinforcing steel is exposed, chip out behind the reinforcing to a 20 mm minimum depth;

- (ii) wire brush reinforcing steel and concrete to remove rust and contaminants; and
 - (iii) splice new reinforcing steel to existing steel where corrosion has depleted the cross-section area by twenty-five percent (25%), as directed by the Contract Administrator.
 - (d) Clean all existing concrete surfaces that will be in contact with the repair concrete to remove all deleterious substances.
 - (e) The Contractor is responsible to create a bond between the new mortar/concrete and the existing substrates. The Contract Administrator will check all repaired areas for bond using a hammer “sounding” method after form removal.
 - (f) Field galvanize any exposed portions of the existing pipe support base plate and anchor bolts.
 - (g) Apply bonding grout or epoxy grout to all existing concrete surfaces that will be in contact with the repair concrete.
 - (h) Cure in accordance with E6.5.2.
- E12.3.1 The Contract Administrator shall inspect the Work in accordance with Specification E6.6 “Inspection by Contract Administrator”.
- E12.4 Measurement and Payment
- (a) Southbound Bridge South Abutment Pipe Support Repairs will not be measured. This item of Work will be paid for at the Contract Lump Sum Price, performed in accordance with the Specification and accepted by the Contract Administrator.

E13. SOUTHBOUND BRIDGE PEDESTRIAN HANDRAIL REPAIRS

E13.1 Description

- (a) This Specification covers all items related to the Southbound Bridge Pedestrian Handrail Repair 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 things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E13.2 Construction Methods

- (a) Locations where pedestrian handrails are loose will be as indicated on the Drawings and confirmed with the Contract Administrator.
- (b) Wood shims shall be installed between adjacent pedestrian rail panels. Shims shall be fit tight so as not to fall out.

E13.3 Measurement and Payment

- (a) Southbound Bridge Pedestrian Handrail Repairs will not be measured. This item of Work will be paid for at the Contract Lump Sum Price for “Southbound Bridge Pedestrian Handrail Repairs”, performed in accordance with the Specification and accepted by the Contract Administrator.

E14. BRIDGE APPROACH ASPHALT PATCHING

E14.1 Description

- (a) This Specification covers all items related to the patching to the damaged existing approach slab asphalt topping at the Southbound Bridge north and south approaches as indicated 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 things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E14.2 Referenced Specifications and Drawings

- (a) CW 3410

E14.3 Materials

- (a) Type 1A asphaltic concrete and all required other materials shall be as specified in CW 3410

E14.4 Construction Methods

- (a) Sawcut the perimeter of the area to be repaired.
- (b) Confirm that existing asphaltic pavement at extents of repair is firmly bonded to approach slab concrete. If asphalt pavement has debonded, the limits of repair shall be extended as approved by the Contract Administrator.
- (c) Preparation of existing concrete pavement shall be done in accordance with 9.1.2(b) of Specification CW 3410.
- (d) Construction of asphalt patching shall be performed in accordance with 9.4 of Specification CW 3410.

E14.5 Measurement and Payment

- (a) Bridge Approach Asphalt Patching will be measured on a unit basis and paid for at the Contract Unit Price per square meter for "Bridge Approach Asphalt Patching", repaired in accordance with this Specification and accepted by the Contract Administrator.

E15. FULL DEPTH RENEWAL OF PAVEMENT SLABS AND JOINTS

E15.1 Description

- (a) This Specification covers all items related to the renewal of the roadway pavement slabs and joints to the north of the Northbound Bridge as indicated in 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 things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E15.2 Referenced Specifications and Drawings

- (a) CW 3230 – Full-Depth Patching of Existing Slabs and Joints;

E15.3 Construction Methods

- (a) Further to Section 9.3 of CW 3230, where slab or joint repairs are not perpendicular to the roadway centreline the tie bars and dowels shall be installed parallel to the longitudinal direction of the roadway. This will require that a jig be set up to ensure all tie bars and dowels are installed uniformly and at the correct angle.
- (b) The concrete median barrier and foundation that is located adjacent to the slab and joint repairs shall remain intact and not disturbed. No saw cutting into the barrier foundation or barrier itself shall occur.
- (c) Where curb is removed in order to repair the slab or joint the curb shall be replaced to the same configuration and dimensions.

E15.3.1 The Contract Administrator shall inspect the Work in accordance with Specification E6.6 "Inspection by Contract Administrator".

E15.4 Measurement and Payment

- (a) Full depth renewal of pavement slabs and joints will be measured and paid for at the Contract Unit Prices as detailed in CW3230.