THE CITY OF WINNIPEG

TENDER

TENDER NO. 329-2025

MIDTOWN BRIDGE MAINTENANCE REPAIRS AND RELATED WORKS

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 MIDTOWN BRIDGE MAINTENANCE REPAIRS AND RELATED WORKS

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, May 30, 2025.

B2.2 The Contract Administrator or the Manager of Purchasing 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 advised that at no time can the Bidder access any private owned property unless it is authorized by The City and approved by the Contract Administrator.

B3.3 The Bidder/Proponent is responsible for inspecting the Site, the nature of the Work to be done and all conditions that might affect their Bid/Proposal 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 inspection

B4. ENQUIRIES

B4.1 All enquiries shall be directed to the Contract Administrator identified in D6.1.

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 D6.

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 D34. Any such costs shall be determined in accordance with D34.

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, Purchasing Division website at 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 D8)

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 at http://www.winnipeg.ca/matmgt/Safety/default.stm.

B13.5 Further to B13.3(d), the Bidder acknowledges that they and all Subcontractors have obtained training required by the Accessibility for Manitobans Act (AMA) available at https://accessibilitymb.ca/resources-events-and-training/online-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: https://www.winnipeg.ca/media/4929/.

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(a).

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

B18.4.2 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.

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 The Work of this Contract is contingent upon Council approval of sufficient funding in the 2025 Capital Budget. If the Capital Budget approved by Council does not include sufficient funding for the Work, the City will have no obligation to award a Contract.

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, Purchasing 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 major components of the Work are as follows:

(a) Replacement of structure steel girder cover plates and sole plates;

(b) Rehabilitation of bridge bearings;

D3.2 The following shall apply to the Work:

(a) Universal Design Policy

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

(b) Department of Fisheries and Oceans Bridge Maintenance Code of Practice

https://www.dfo-mpo.gc.ca/pnw-ppe/codes/interim-provisoire/bridges-ponts-eng.html

(c) Canadian Navigable Waters Act

The City of Winnipeg will obtain Approval under the Canadian Navigable Waters Act for the construction of this work. The Contractor shall adhere to all conditions set out in the Transport Canada Navigation Protection Program (NPP) Approval Package. A copy of this approval must be kept on site at all times during construction. At minimum, it is anticipated that river signage including marker buoys advising of construction will be required as well as possible flagging of watercraft during structural steel erection or other operations.

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. DEFINITIONS

D5.1 When used in this Tender:

(a) “**Payment Certification**” means the Contract Administrator’s statement of the sums certified to be paid by the City to the Contractor with reference to its interim and final progress estimates and/or the Contractor’s Proper Invoice;

(b) “**Proper Invoice**” means the definition within *The Builders’ Liens Act*, R.S.M. 1987, c. B91 and any subsequent amendments thereto, and also includes the criteria to be included in an invoice, as set out in the Measurement and Payment provisions of the Contract;

(c) “**Supply Chain Disruption”** means an inability by the Contractor to obtain goods or services from third parties necessary to perform the Work of the Contract within the schedule specified therein, despite the Contractor making all reasonable commercial efforts to procure same. Contractors are advised that increased costs do not, in and of themselves, amount to a Supply Chain Disruption;

(d) “**The Builders’ Liens Act**” or “**the BLA**” means *The Builders’ Liens Act*, R.S.M. 1987, c. B91 and any subsequent amendments thereto;

(e) ”**ASTM**” means the American Society for Testing and Materials that complies with the latest edition of standards including amendments and supplements in effect on the date of issue of this Bid Opportunity shall apply to the Work;

(f) ”**CSA**” means the Canadian Standards Association that complies with the latest edition of standards including amendments and supplements in effect on the date of issue of this Bid Opportunity shall apply to the Work ;

(g) ”**ICRI**” means the International Concrete Repair Institute with the latest edition of standards including amendments and supplements in effect on the date of issue of this Bid Opportunity shall apply to the Work .

D6. CONTRACT ADMINISTRATOR

D6.1 The Contract Administrator is WSP Canada Inc., represented by:

Michelle Wadelius, P. Eng, PMP
Senior Engineer
Telephone No. 204-272-2033
Email Adress: michelle.wadelius@wsp.com

D6.2 At the pre-construction meeting, Michelle Wadelius will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D7. CONTRACTOR'S SUPERVISOR

D7.1 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.

D8. ACCESSIBLE CUSTOMER SERVICE REQUIREMENTS

D8.1 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.

D8.1.1 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.

D8.1.2 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.

D9. SUPPLIER CODE OF CONDUCT

D9.1 The Contractor has reviewed and understands the City's Supplier Code of Conduct. This document is located at: https://www.winnipeg.ca/media/4891

D9.2 The Contractor agrees to comply with the Supplier Code of Conduct as it may be amended or replaced from time to time. The Contractor is responsible for periodically checking the above link for updates to the Supplier Code of Conduct. Contract signature on Form A: Bid/Proposal from the Contractor signifies agreement to the Supplier Code of Conduct which comes into effect once the Contract starts.

D9.3 If there is a conflict between the Contract and the Supplier Code of Conduct – the Contract will prevail.

D10. UNFAIR LABOUR PRACTICES

D10.1 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 conventions as ratified by Canada.

D10.2 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.

D10.3 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.).

D10.4 Failure to provide the evidence required under D10.3, may be determined to be an event of default in accordance with C18.

D10.5 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.

D10.5.1 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.

D10.5.2 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 D10.5. The City may also hold back the amount of the Unfair Labour Practice Penalty from payment for any amount it owes the Contractor.

D10.5.3 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.

D11. FURNISHING OF DOCUMENTS

D11.1 Upon award of the Contract, the Contractor will be provided with 'issued for construction' Contract Documents electronically, including Drawings in PDF format only.

SUBMISSIONS

D12. AUTHORITY TO CARRY ON BUSINESS

D12.1 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.

D13. SAFE WORK PLAN

D13.1 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.

D13.2 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, Purchasing Division website at http://www.winnipeg.ca/matmgt/Safety/default.stm

D13.3 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.

D14. INSURANCE

D14.1 The Contractor shall provide and maintain the following insurance coverage:

(a) commercial general liability insurance, in the amount of at least five million dollars ($5,000,000.00) 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, broad form property damage cover 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, including testing and commissioning, in the amount of one hundred percent (100% of the total Contract Price, written in the name of the Contractor and The City, at all times during the performance of the Work and until the date of Substantial Performance.

D14.2 Deductibles shall be borne by the Contractor.

D14.3 All policies shall be taken out with the insurers duly licensed to carry on business in the Province of Manitoba.

D14.4 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.

D14.5 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.

D15. CONTRACT SECURITY

D15.1 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 amount of fifty percent (50%) of the Contract Price; and

(b) labour and material payment bond of a company registered to conduct the business of a surety in Manitoba, in an amount equal to fifty percent (50%) of the Contract Price.

D15.1.1 Bonds are available at:

(a) Performance Bond https://www.winnipeg.ca//media/4928/

(i) Performance Bond – Schedule A - Form of Notice
https://www.winnipeg.ca/media/4831/

(ii) Performance Bond – Schedule B – Surety's Acknowledgement
https://www.winnipeg.ca/media/4832/

(iii) Performance Bond – Schedule C – Surety's Position
https://www.winnipeg.ca/media/4833/

(b) Labour & Material Payment Bond https://www.winnipeg.ca//media/4930/

(i) L&M Bond – Schedule A – Notice of Claim
https://www.winnipeg.ca/media/4834/

(ii) L&M Bond – Schedule B – Acknowledgement of a Notice
https://www.winnipeg.ca/media/4835/

(iii) L&M Bond – Schedule C – Surety's Position
https://www.winnipeg.ca/media/4836/

D15.1.2 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 D15.1.2(b).

D15.1.3 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.

D15.1.4 Digital bonds passing the verification process will be treated as original and authentic.

D15.2 The Contractor shall provide the Contract Administrator identified in D6 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.

D15.3 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 inD15.1(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.

D16. SUBCONTRACTOR LIST

D16.1 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 the General Conditions for the return of the executed Contract Documents, if applicable.

D17. REQUIREMENTS 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; if applicable:

(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.

D17.9 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 D12;

(ii) evidence of the workers compensation coverage specified in C6.15;

(iii) the Safe Work Plan specified in D13;

(iv) evidence of the insurance specified in D14;

(v) the contract security specified in D15;

(vi) the Subcontractor list specified in D16;

(vii) the Requirements for Site Accessibility Plan specified in D17;

(viii) the direct deposit application form specified in D29; and

(ix) a detailed work schedule.

(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 Contractor shall not commence the Work on the Site before July 2, 2025.

D18.4 The City intends to award this Contract by June 24, 2025.

D18.4.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

D19. WORK BY OTHERS

D19.1 Further to C6.25, the Contractor's attention is directed to the fact that other Contractors, the personnel of Utilities and the staff of the City may be working within the project limit, approach roadway, adjacent roadways or right-of-way. The activities of these agencies may coincide with the Contractors execution of Work and it will be the Contractor's responsibility to cooperate to the fullest extent with other personnel working in the area, and such cooperation is an obligation of the Contractor under the terms of Contract.

D19.2 Work by others on or near the Site will include but not necessarily be limited to:

(a) N/A.

D19.2.1 Further to D19.1 the Contractor shall cooperate and coordinate all activities with all parties performing required Work by Others identified in D19.1 and accommodate the necessary area on Site required for the Work by Others to complete the Work

D20. SUBSTANTIAL PERFORMANCE

D20.1 The Contractor shall achieve Substantial Performance by August 22, 2025.

D20.2 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.

D20.3 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.

D21. TOTAL PERFORMANCE

D21.1 The Contractor shall achieve Total Performance by August 29, 2025.

D21.2 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.

D21.3 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.

D22. LIQUIDATED DAMAGES

D22.1 If the Contractor fails to achieve Total Performance in accordance with the Contract by the day fixed herein for Total Performance, the Contractor shall pay the City Two Thousand dollars ($2,000) per Calendar Day for each and every Calendar Day following the day fixed herein for Total Performance during which such failure continues.

D22.2 The amount specified for liquidated damages in D22.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Total Performance by the day fixed herein for same.

D22.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D23. SUPPLY CHAIN DISRUPTION SCHEDULE DELAYS

D23.1 The City acknowledges that the schedule for this Contract may be impacted by the Supply Chain Disruption. Commencement and progress of the Work shall be performed by the Contractor with due consideration to the delivery requirements and schedule identified in the Contract in close consultation with the Contract Administrator.

D23.2 If the Contractor is delayed in the performance of the Work by reason of the Supply Chain Disruption, 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.

D23.3 A minimum of seven (7) Calendar Days prior to the commencement of Work, the Contractor shall declare whether a Supply Chain Disruption will affect the start date. The Contractor shall provide sufficient evidence that the delay is directly related to a Supply Chain Disruption, including but not limited to ordering of Material or Goods, production and/or manufacturing schedules or availability of staff as appropriate.

D23.4 For any delay related to Supply Chain Disruption 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 D23.3. Failure to provide this notice will result in no additional time delays being considered by the City.

D23.5 The Work schedule, including the durations identified in D18 to D21 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.

D23.6 Where Work not previously identified is being carried over solely as a result of delays related to Supply Chain Disruption, 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 Supply Chain Disruption, a partial consideration of the cost of temporary works will be considered by the Contract Administrator.

D23.7 Any time or cost implications as a result of Supply Chain Disruption and in accordance with the above, as confirmed by the Contract Administrator, shall be documented in accordance with C7.

D24. SCHEDULED MAINTENANCE

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.

INVOICES & MEASUREMENT AND PAYMENT

D28. MEASUREMENT AND PAYMENT

D28.1 C12.2 is deleted and replaced with the following:

C12.2 The amounts to be paid by the City to the Contractor shall be as set out in the Payment Certification. In the event the Payment Certification does not align with the Contractor's Proper Invoice and payment by the City to the Contractor is not made, or not going to be made, for the invoiced amount within 28 Calendar Days of receipt of the Proper Invoice, the City will issue a notice of non-payment to the Contractor in accordance with the BLA.

C12.2.1 For unit price Contracts, such sums shall be determined by the Contract Administrator upon the basis of the unit prices for the various classes of the Work stated on Form B: Prices. The total amount to be paid to the Contractor for the Work will be the amount arrived at by measuring the amount of each class of the Work listed on Form B: Prices and performed in accordance with the Contract, and pricing the same, in accordance with the unit prices stated thereon.

C12.2.2 For lump sum Contracts, such sums shall be determined by the Contract Administrator upon the basis of the lump sum price stated on Form B: Prices, if applicable, but in any event the lump sum price broken down into the percentage completed for each portion of the Work, commonly referred to as detailed prices.

D28.2 C12.7 to C12.15 are deleted and replaced with the following:

C12.7 By the seventh (7) Calendar Day after the end of each month, the Contract Administrator shall issue to the Contractor a progress estimate indicating its opinion of the quantity and value of Work performed during the previous month. The Contractor may use the progress estimate to form part of its Proper Invoice as support of the type and quantity of Work performed. In the event the Contractor choses to produce its own documentation of the type and quantity of Work performed to form part of its Proper Invoice, the content shall be in accordance with C12.2 and the format of such documentation should follow that of a typical progress estimate, including all evidence and records of measurement that the Contract Administrator would require to certify payment. In either event the Contractor shall include such supporting documentation as part of its invoice.

C12.8 If the Contractor agrees with the progress estimate provided by the Contract Administrator it should indicate that on its Proper Invoice. If the Contractor does not agree with the progress estimate provided by the Contract Administrator it should attempt to reconcile the discrepancy, which could result in a revised progress estimate to be provided by the Contract Administrator or a revised invoice by the Contractor, so that the progress estimate and the Proper Invoice align. In the event that the discrepancy is not reconciled then the Contractor should detail the items within the progress estimate that it disagrees with in order that the value on the Proper Invoice aligns with and is supported by the progress estimate with noted discrepancies.

C12.9 Any payment made by the City to the Contractor on account of a Proper Invoice shall be less any holdback required to be made by The Builders' Liens Act, and such holdbacks or other amounts which the City is entitled to withhold pursuant to the Contract.

C12.10 If in the Contractor’s opinion the Work performed during the previous month is minimal or does not warrant an invoice, the Contractor is permitted to not submit an invoice on the condition that the Contractor advises the Contractor Administrator in writing.

C12.11 Unless agreed to by the Contract Administrator, in writing, on an exception basis, the Contractor shall not submit invoices more frequently than monthly.

C12.12 Any reference to payment submittals or payment processes in the NMS Sections of the Contract are deleted and replaced with the payment submittals and payment processes within Section C12 of the General Conditions, as amended by the Supplemental Conditions.

FINAL PAYMENT

D28.3 The Contractor shall indicate on its invoice if it is the final invoice for Work performed under the Contract. Payment Certification, in response to receipt of the final Proper Invoice by the Contractor, shall be subject to the following conditions:

(a) issuance by the Contract Administrator of a certificate of Total Performance;

(b) receipt by the City of a certificate from the Workers Compensation Board stating that full payment has been made to the Board with respect to all assessments owing.

D28.4 Payment on account of the holdback made by the City pursuant to The Builders' Liens Act, shall be paid to the Contractor when the time for filing liens or trust claims has elapsed, unless the City is in receipt of a lien or trust claim.

D28.5 Neither the issuance of a certificate of Total Performance nor the payment of the final Proper Invoice shall relieve the Contractor from their responsibilities either under C13 or as a result of any breach of the Contract by the Contractor including, but not limited to, defective or deficient Work appearing after Total Performance, nor shall it conclude or prejudice any of the powers of the Contract Administrator or the Chief Administrative Officer hereunder.

D28.6 Subject to C12.17, acceptance by the Contractor of payment on account of the final Proper Invoice shall constitute a waiver and release by them of all claims against the City whether for payment for Work done, damages or otherwise arising out of the Contract.

D28.7 If the Contractor disputes a Payment Certification related to a notice of non-payment by the City to the Contractor in accordance with the BLA, the Contractor may appeal the determination of the Contract Administrator to the Chief Administrative Officer as provided for in C21. If prior to the appeal being concluded, the Contractor gives a notice of adjudication to the City pursuant to the BLA, the appeal process will be discontinued.

INVOICES

D28.8 Further to C12, the Contractor:

(a) shall submit invoices for Work performed during the previous calendar month in accordance with the instruction on the City's website at: https://www.winnipeg.ca/finance/corporate-accounts-payable.stm; and

(b) should copy the Contract Administrator on submission of its invoice.

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.

D30. PAYMENT SCHEDULE

D30.1 Further to C12, payment shall be in accordance with the following payment schedule:

(a) Portions of Work designated as Lump Sum payment will be paid on a monthly basis as determined by the Contract Administrator in consultation with the Contractor provided the portion of the Work to be paid has been permanently incorporated into the Works.

WARRANTY

D31. WARRANTY

D31.1 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.

DISPUTE RESOLUTION

D32. DISPUTE RESOLUTION

D32.1 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 D32.

D32.2 The entire text of C21.4 is deleted, and amended to read: "Intentionally Deleted"

D32.3 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 Purchasing 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.

D32.4 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.

D32.4.1 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.

D32.4.2 As these negotiations are not an adjudicative hearing, neither party may have legal counsel present during the negotiations.

D32.4.3 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.

D32.4.4 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 D32.4.3, 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.

INDEMNITY

D33. INDEMNITY

D33.1 Indemnity shall be as stated in C17.

D33.2 Notwithstanding C17.1, the Contractor shall save harmless and indemnify the City in the amount of twice the Contract Price or five million dollars ($5,000,000), whichever is greater, against all costs, damages or expenses arising from actions, claims, demands and proceedings, by whomsoever brought, made or taken as a result of negligent acts or negligent omissions of the Contractor, their Subcontractors, employees or agents in the performance or purported performance of the Work, and more particularly from:

(a) accidental injury to or death of any person whether retained by or in the employ of the contractor or not, arising directly or indirectly by reason of the performance of the Work, or by reason of any trespass on or damage to property;

(b) damage to any property owned in whole or in part by the City, or which the City by duty or custom is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain;

(c) damage to, or trespass or encroachment upon, property owned by persons other than the City;

(d) any claim for lien or trust claim served upon the City pursuant to The Builders' Liens Act;

(e) failure to pay a Workers Compensation assessment, or Federal or Provincial taxes;

(f) unauthorized use of any design, device, material or process covered by letters patent, copyright, trademark or trade name in connection with the Work;

(g) inaccuracies in any information provided to the City by the Contractor.

D33.3 Further to C17, The City shall save harmless and indemnify the Contractor in the amount of twice the Contract Price or five million dollars ($5,000,000), whichever is greater, against all costs, damages or expenses arising from actions, claims, demands and proceedings, by whomsoever brought, made or taken as a result of negligent acts or negligent omissions of the City, their employees or agents in the performance of its obligation under the Contract.

THIRD PARTY AGREEMENTS

D34. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS

D34.1 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.

D34.2 Further to D34.1, in the event that the obligations in D34 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.

D34.3 For the purposes of D34:

(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.

D34.4 Modified Insurance Requirements

D34.4.1 If not already required under the insurance requirements identified in D14, 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.

D34.4.2 If not already required under the insurance requirements identified in D14, 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.

D34.4.3 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.

D34.4.4 Further to D14.4, 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.

D34.4.5 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.

D34.5 Indemnification By Contractor

D34.5.1 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.

D34.5.2 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.

D34.6 Records Retention and Audits

D34.6.1 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.

D34.6.2 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 D34.6.1 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.

D34.7 Other Obligations

D34.7.1 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.

D34.7.2 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.

D34.7.3 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.

D34.7.4 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.

D34.7.5 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.

D34.7.6 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.

ADJUSTMENTS FOR CHANGES IN LAWS, TAXES, OR TARRIFS

D35. ADJUSTMENTS FOR CHANGES IN LAWS, TAXES, OR TARIFFS

D35.1 Further to C12.4 and subject to C6.13, the Contract Price shall be adjusted if any change in a law or tax imposed under the Excise Act, the Excise Tax Act, the Customs Act, the Customs Tariff, The Mining Tax Act (Manitoba), or The Retail Sales Tax Act (Manitoba), by an act of the Congress of the United States of America, or by Executive Order by the President of the United States under the International Emergency Economic Powers Act of the United States of America or similar legislation:

(a) occurs after the Submission Deadline;

(b) applies to Material; and

(c) affects the cost of that Material to the Contractor.

D35.2 Further to C12.5, if a change referred to in C12.4 occurs, the Contract Price shall be increased or decreased by an amount equal to the amount that is established, by an examination of the relevant records of the Contractor, to be the increase or decrease in the cost incurred that is directly attributable to that change, and which the Contractor has proven to the Contract Administrator represents the minimum amount of increase necessary in order to obtain necessary Material or Plant. For the avoidance of doubt, the Contractor shall be required to provide satisfactory proof that it has investigated alternative options for obtaining equivalent Material or Plant and reducing or eliminating the increase in Contract Price, up to and including entering into purchase agreements with vendors located in other jurisdictions, in order for Contractor to be able to avail itself of the increase in Contract Price permitted.

FORM J: SUBCONTRACTOR LIST
(See D16)

Click or tap here to enter text.

Name	Address

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, Purchasing 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:

City Drawing No.	Drawing Title
B114-25-01	Cover Sheet and Drawing List
B114-25-02	Design Data and General Notes
B114-25-03	Proposed General Arrangement Plan, Elevation and River Span Cross-Section
B114-25-04	Bearing Repair Details
B114-25-05	Girder Repair Details (Sheet 1 of 2)
B114-25-06	Girder Repair Details (Sheet 2 of 2)
B114-25-07	Pier 3 and South Abutment Jacking Locations
B114-25-08	Temporary Traffic Signage (Sheet 1 of 2)
B114-25-09	Temporary Traffic Signage (Sheet 2 of 2)

Reference Drawing No.	Drawing Title
4473-12A	South Abutment Crushed Stone Fill as Placed (1954)
4473-13	Details of South Abutment (1954)
W83-238	Sheet 3 of 7: Glacier GY'C'350 (1984)
W84-238	Sheet 5 of 7: Glacier GX'C'350 (1984)
B-5520-4	Midtown Bridge Deck Reconstruction Structural Strengthening and Related Works- Plan & General Elevation of Proposed Bridge
B-5520-5	Midtown Bridge Deck Reconstruction Structural Strengthening and Related Works - Bearing Details – Spans 1, 2 and 3 (1985)
B-5520-7	Midtown Bridge Deck Reconstruction Structural Strengthening and Related Works – Modifications to Existing Girders. Spans 1, 2 and 3 Girder G1 (1985)
B-5520-8	Midtown Bridge Deck Reconstruction Structural Strengthening and Related Works – Modifications to Existing Girders. Spans 1, 2 and 3 Girders G2 and G3 (1985)
B-5520-9	Midtown Bridge Deck Reconstruction Structural Strengthening and Related Works – Modifications to Existing Girders Spans 1, 2 and 3 Girders G5 and G6 (1985)
B-5520-11	Midtown Bridge Deck Reconstruction Structural Strengthening and Related Works - Jacking Beams and Miscellaneous Details (1985)

B114-05-01 Bridge Maintenance Bridge Bearing Refurbishment Plan, Elevation and Details (2005)

GENERAL REQUIREMENTS

E2. MOBILIZATION AND DEMOBILIZATION

E2.1 Description

E2.1.1 This Specification covers all operations relating to the mobilization and demobilization of the Contractor to the Site, as specified herein.

E2.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified

E2.2 References

E2.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

(a) CW 1120 – Existing Services, Utilities and Structures;

(b) CW 1130 – Site Requirements;

(c) Specification E3, Traffic Control; and

(d) Specification E4, Traffic Management.

E2.3 Scope of Work

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

(a) Mobilizing and demobilizing on-site Work facilities;

(b) Supplying and installing secure fencing/gates for portions of the laydown areas the Contractor wishes to secure;

(c) Maintaining and removing any access roadways as needed into the laydown areas;

(d) Traffic Control (E3), and Traffic Management (E4).

E2.4 Submittals

E2.4.1 The Contractor shall submit the following to the Contract Administrator seven (7) Calendar Days prior to mobilization on Site:

(a) A plan highlighting the Site layout which includes: laydown area location(s), staging areas, office facility location, access road(s), temporary secure fencing limits and gate locations for review and approval.

E2.5 Materials

E2.5.1 General

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

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

E2.6 Equipment

E2.6.1 General

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

E2.7 Construction Methods

E2.7.1 Layout of On-Site Work Facilities

(a) The Contractor shall mobilize all on-site Work and other temporary facilities.

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

E2.8 Site Security

(a) The Contractor has discretion on what areas of the site they wish to secure. This may include the Contractor's lay down area, material storage areas, and/or access roads. These areas may be fenced and gated for security and to discourage pedestrian entrance to construction areas and to control any potential hazard to the public, particularly children. The Contractor shall not fence off areas where public traffic or pedestrians need to travel, such as open roadway lanes or sidewalks/bike paths.

E2.9 Access Roadway

(a) The Contractor shall note the laydown areas shown available on the Drawings.

(b) When the Contractor wishes to install an access along a laydown border marked "Contractor Laydown Area – Access", they shall make a written request to the Contract Administrator before commencing construction. The Contract Administrator shall have two (2) Business Days to review and respond to the request.

(c) The Contractor shall maintain any access roadway they install.

(d) Upon completion of the Work, the area shall be restored to its original condition.

E2.7.4 Restoration of Existing Facilities

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

E2.8 Quality Control and Assurance

E2.8.1 Inspection

(a) All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through to final acceptance of the specified Work.

(b) The Contractor shall be wholly responsible for the control of all operations incidental thereto, notwithstanding any inspection or

acceptance that may have been previously given. The Contract Administrator reserves the right to reject any materials or Works, which are not in accordance with the requirements of this Specification.

E2.8.2 Access

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

E2.9 Measurement and Payment

E2.9.1 Mobilization and Demobilization

(a) "Mobilization and Demobilization" will not be measured. This Item of Work will be paid for at a percentage of the Contract Lump Sum Price, which price shall be payment in full for supplying all materials and for completing all operations herein described and all other items incidental to the work included in this Specification, accepted and measured by the Contract Administrator. These percentages shall be as follows:

(i) when Contract Administrator is satisfied that construction has commenced on Part 1 Work thirty percent (30%);

(ii) during construction, percentage distributed equally on a monthly basis at the discretion of the Contract Administrator of sixty percent (60%);

(iii) upon Total Performance ten percent (10%).

E3. TRAFFIC CONTROL

E3.1 In accordance with the Manual of Temporary Traffic Control on City Streets (MTTC) the Contract Administrator shall make arrangements with the Traffic Services Branch of the City of Winnipeg to place, maintain, and remove all regulatory signs and traffic control devices authorized and/or required by the Traffic Management Branch in the following situations; as applicable:

(a) Parking restrictions,

(b) Stopping restrictions,

(c) Turn restrictions,

(d) Diamond lane removal,

(e) Full or directional closures on a Regional Street,

(f) Traffic routed across a median,

(g) Full or directional closure of a non-regional street where there is a requirement for regulatory signs (turn restrictions, bus stop relocations, etc.) to implement the closure.

(h) Approved Designated Construction Zones with a temporary posted speed limit reduction. Traffic Services will be responsible for placing all of the advance signs and 'Construction Ends' (TC-4) signs. The Contractor is still responsible for all other temporary traffic control including but not limited to barricades, barrels and tall cones.

E3.2 Further to (c), the Contractor shall make arrangement with the Traffic Services Branch of the City of Winnipeg to supply regulatory signs as required.

E3.3 Upon request from the Contract Administrator, the Contractor shall provide records demonstrating that the Site has been maintained.

E3.4 Further to E3.1(c) and E3.1(d) the Contractor shall make arrangements with the Traffic Services Branch of the City of Winnipeg to reinstall the permanent regulatory signs after the Contract

Work is complete. At this time the Contractor shall make arrangements to drop off the stockpiled materials to Traffic Services at 495 Archibald Street.

E3.5 Any changes to the approved traffic management plan must be submitted to the Contract Administrator a minimum of (five) 5 Working Days prior to the required change for approval.

E3.6 If the Contract Administrator determines that the Contractor is not performing Traffic Control in accordance with this specification, Traffic Services Branch may be engaged to perform the Traffic Control. In this event the Contractor shall bear the costs associated charged to the project by the Traffic Services Branch of the City of Winnipeg in connection with the required Works undertaken by the Contractor.

E4. TRAFFIC MANAGEMENT

E4.1 Description

E4.1.1 This Specification shall cover all operations relating to Traffic Management.

E4.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E4.1.3 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

(a) CW 1130

E4.2 Scope of Work

E4.2.1 Further to clauses 3.7 of CW 1130:

(a) Where not shown on the Drawings, single lane closures on intersecting and/or adjoining Regional Streets shall only be permitted during non-peak periods when required for construction activities when approved by the Traffic Management Branch. Storage/parking of materials, equipment or vehicles is not permitted on Regional Streets at any time unless approved by the Contract Administrator, in consultation with the Traffic Management Branch.

(b) An approved traffic staging/ signage plan is included in the Drawings (see E1.4). Any changes to this plan, with respect to lane closures, must be approved by the Contract Administrator.

(c) Flag persons may be necessary to maintain the flow of traffic during certain work operations.

(d) Signage, marker buoys and flag persons may be necessary to caution and / or restrict passage of watercraft during the completion of the Work and during specific overhead operations such as the installation of work platforms or erection of girder cover plates. The final requirements with will be identified in the Transport Canada Navigation Protection Program (NPP) Approval Package which will be provided to the Contractor once it is available to the City or be provided by the Contract Administrator.

(e) Should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he/she shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 24 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.

(f) Pedestrian access must be maintained on the east side of the bridge at all times.

(g) Ambulance/emergency vehicle access must be maintained at all times.

(h) Winnipeg Transit access to be maintained, including bus stops. Should the Contractor be unable to maintain bus stops or side street bus routes, it shall be reviewed with the

Contract Administrator at least forty-eight (48) hours to see if modifications can be made.

E4.3 Equipment

E4.3.1 General

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

E4.4 Construction Methods

E4.4.1 The Contractor shall advise the Contract Administrator five (5) days in advance of any new or change in lane closure.

E4.4.2 The Contractor shall schedule their activities to minimize the time required for closure of the traffic lane, river path or river. All efforts shall be taken to complete operations not requiring traffic or pedestrian closures in advance of closing lanes. Lanes or paths shall be reopened at earliest opportunity to safely do so.

E4.4.3 Erect and maintain all applicable traffic control devices (including, but not limited to, warning signs, barrels, tall cones and chevrons) as specified by MTTC, the Traffic Management Branch, the Transport Canada Navigation Protection Program (NPP) Approval Package, the Contract Administrator.

E4.4.4 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 MTTC and shall, at all times, ensure that maximum protection is afforded to the road-user and river-users and that his/her operations in no way interfere with the safe operation of traffic, cyclists, pedestrians or watercraft operators.

E4.4.5 Improper signing will be sufficient reason for the Contract Administrator to order the Works to cease on Site.

E4.4.6 During the hours when the Contractor is not working, equipment and stockpiled materials shall be left in such a location so as not to interfere with or present a hazard to motorists, cyclists or pedestrians.

E4.5 Measurement and Payment

E4.5.1 Supply, installation, maintenance and removal of traffic management devices will not be measured. This Item of Work shall be paid for at the Contract Lump Sum Price for “Traffic Management”, which price shall be payment in full for supplying all materials, labor and equipment and for performing all operations shown on the drawings or herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E5. PEDESTRIAN SAFETY

E5.1 During the project, a security fence acceptable to the Contract Administrator shall be installed at locations as deemed necessary by them. The Contractor shall be responsible for maintaining the fence in a proper working condition. No measurement for payment shall be made for this work.

E6. SHOP DRAWINGS

E6.1 Description

E6.1.1 This Specification provides instructions for the preparation and submission of Shop Drawings.

E6.1.2 This Specification shall revise, amend, and supplement the requirements of CW 1110.

E6.1.3 The Contractor shall provide all Submittals and Shop Drawings required in the Contract as well as any additional Submittals reasonably requested by the Contract Administrator, at the Contractor's expense.

E6.1.4 The term "Shop Drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, which are to be provided by the Contractor to illustrate details of a portion of the Work.

E6.1.5 Original drawings are to be prepared by the Contractor, subcontractor, supplier, distributor, or manufacturer, which illustrate the appropriate portion of Work; showing fabrication, layout, setting, or erection details as specified in appropriate sections.

E6.1.6 Shop Drawings are required for the following components:

(a) Structural steel;

(b) Bearings and associated steel;

E6.2 Scope of Work

E6.2.1 Review Shop Drawings, product data, and samples prior to submission and stamp and sign drawings indicating conformance to the Contract requirements.

E6.2.2 The Contractor shall provide all Submittals and Shop Drawings required in the Contract as well as any additional Submittals reasonably requested by the Contract Administrator, at the Contractor's expense.

(a) field measurements;

(b) field construction criteria;

(c) catalogue numbers and similar data.

E6.2.3 Coordinate each shop drawing submission with the requirements of the Work and Contract Documents. Shop Drawings of separate components of a larger system will not be reviewed until all related drawings are available.

E6.2.4 Notify Contract Administrator, in writing at time of shop drawing submission, of deviations from requirements of Contract Documents.

E6.2.5 Responsibility for deviations in Shop Drawing submission from requirements of Contract Documents is not relieved by the Contract Administrator's review of submission, unless the Contract Administrator gives written acceptance of specified deviations.

E6.2.6 Responsibility for errors and omissions in the shop drawing submission is not relieved by the Contract Administrator's review of the submittals.

E6.2.7 The Contractor shall make any corrections required by the Contract Administrator and shall resubmit the required number of corrected copies of Shop Drawings. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Contract Administrator on the previous submission.

E6.2.8 After the Contract Administrator has reviewed and returned the copies, distribute the copies to sub-trades as appropriate.

E6.2.9 Maintain one (1) complete set of reviewed Shop Drawings, filed by Specification section number, at the Site for use and reference by the Contract Administrator and Subcontractors.

E6.3 Submittals

E6.3.1 Schedule submittals at least fourteen (14) Calendar Days before dates reviewed submittals will be needed, and allow for a fourteen (14) Calendar Days period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract.

E6.3.2 Submit five (5) paper prints or one (1) electronic PDF of Shop Drawings. The Contractor is advised that for paper copies, the Contract Administrator will retain three (3) copies of all submittals and return two (2) copies to the Contractor.

E6.3.3 Further to CW 1110, all submissions must be in metric units. Where data is in imperial units, the correct metric values shall also be shown on the submissions for Contract Administrator review.

E6.3.4 Accompany shop drawing submissions with a transmittal letter containing:

(a) date;

(b) project title and bid opportunity number;

(c) Contractor's name and address;

(d) number of each Shop Drawing, product data, and sample submitted;

(e) specification section, title, number, and clause;

(f) drawing number and detail/section number;

(g) other pertinent data.

E6.3.5 Shop drawing submissions shall include:

(a) date and revision dates;

(b) project title and bid opportunity number;

(c) name of:

(i) Contractor;

(ii) Subcontractor;

(iii) supplier;

(iv) manufacturer;

(v) separate detailer when pertinent.

(d) identification of product or material;

(e) relation to adjacent structure or materials;

(f) field dimensions, clearly identified as such;

(g) specification section name, number and clause number or drawing number and detail/section number;

(h) applicable standards, such as CSA or CGSB numbers;

(i) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements, and compliance with Contract Documents.

E6.3.6 Shop Drawings for the following components shall bear the seal of a Professional Engineer registered in the province of Manitoba:

(a) Bearing Top Plates;

(b) Metal Fabrications, Layout, and Erection Details for Structural Steel;

E6.4 Equipment

E6.4.1 General

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

E6.5 Other Considerations

(a) Fabrication, erection, installation, or commissioning may require modifications to equipment or systems to conform to the design intent. Revise pertinent Shop Drawings and resubmit.

(b) Material and equipment delivered to the Site will not be paid for until pertinent Shop Drawings have been submitted and reviewed.

(c) Incomplete shop drawing information will be considered as stipulated deductions for the purposes of progress payment certificates.

(d) No delay or cost claims will be allowed that arise because of delays in submissions, re-submissions, and review of Shop Drawings.

(e) Only two (2) reviews of Shop Drawings will be made by the Contract Administrator at no cost. Each additional review will be charged to the Contractor at the Contract Administrator's scheduled rates and at the discretion of the Contract Administrator. The Contract Administrator's charges for the additional Work will be deducted from the Contractor's Progress Certificates.

E6.6 Measurement and Payment

(a) Shop Drawings shall be considered incidental to the Work and no separate measurement or payment will be made.

E7. TEMPORARY PROTECTION SYSTEM

E7.1 Description

E7.1.1 This Specification shall cover all operations related to the design, supply, installation, maintenance and removal of temporary protective systems.

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 References

E7.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

(a) Specification E8, Temporary Jacking of Superstructure

(b) Specification E9, Structural Steel Removal

(c) Specification E11, Erection of Structural Steel

(d) Specification E13, Bridge Bearing Refurbishment

E7.3 Scope of Work

E7.3.1 The Work under this Specification shall involve:

(a) Demolition Catch Platforms and Work Platforms;

(b) Temporary protective systems shall also be intended to permit the Contractor to carry out the following works:

(i) Surface preparation and coating of bridge structural steel;

(ii) Installation of temporary bracing,

(iii) Replacement of structural steel cover plates;

(iv) Removal, rehabilitation and installation of bearings and;

(v) Any other activities required to complete the Works.

E7.4 Submittals

(a) The protective systems shall be designed by, prepared by, and bear the seal and signature of a Professional Engineer (Design Engineer) registered in the Province of Manitoba. Detailed drawings, specifications and design notes for the protective systems, bearing the seal and signature of the Design Engineer shall be submitted by the Contractor to the Contract Administrator at least seven (7) calendar days prior to the start of any protection

system installation. The submission of the protection system detailed drawings, specifications and design notes to the Contract Administrator shall in no way relieve the Contractor of full responsibility for the design and safe and effective functioning of the protective system.

(b) The Contractor shall provide the Contract Administrator with proof that the protective systems are installed in accordance with the detailed drawings and specifications. This proof shall be in the form of a letter bearing the seal and signature of protective systems' Design Engineer certifying that the protective system Design Engineer has carried out a personal inspection of the installation, and that the installation is in accordance with the design.

E7.5 Materials

E7.5.1 General

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

(b) 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.

E7.6 Equipment

E7.6.1 General

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

E7.7 Construction Methods

E7.7.1 General

(a) The Contractor shall be responsible for constructing the temporary protective systems.

(b) The Contractor shall be fully responsible for ensuring the public safety in areas underlying and adjacent to the construction site. The Contractor will be responsible for any loss or damage caused as a result of the Contractor's actions. Any debris that enters the roadway envelope of a travelled lane shall be immediately cleaned up by the Contractor.

(c) It can be suspended from the existing superstructure, supported from the existing ground, or otherwise. Any stay-in-place anchorages that are installed shall be stainless steel and shall be set back a minimum of 12 mm from the exposed surface, and subsequently grouted with a high quality grout. The details of any proposed anchorages or attachments to the existing structure shall be included in the submitted drawings of the temporary protective system, and subject to the approval of the Contract Administrator.

E7.7.2 Demolition Catch Platforms and Work Platforms

(a) The Contractor shall provide all necessary access / work platforms to facilitate structural removals and associated inspection of all Works by the Contract Administrator.

(b) The platforms shall be designed by the Contractor's Engineer to support the anticipated construction live load as well as any anticipated dead load resulting from removed material or demolition debris.

(c) The platforms shall be designed to be of a type that does not detrimentally affect the structural integrity of the existing bridge structure. Maximum load imposed on the structure shall be within that identified on the Drawings.

(d) Drilling into the girders to secure any platforms shall not be permitted.

(e) The Contractor shall construct temporary protective systems to prevent debris, tools, forms, waste products, construction materials and equipment, and any material whatsoever from falling into the river or otherwise entering the below pedestrian path. The Contractor shall take all necessary safety precautions to ensure that no materials leave the construction work areas and subsequently enter the roadway envelope or river during the Contractor's construction operations. The roadway envelope of any travelled lane is defined as follows:

(i) Horizontally, it is the space occupied from hypothetical lane edge to lane edge.

(ii) Vertically, the existing vertical clearances shall be maintained at all times.

(f) For work above the river, a catch platform system shall be provided. For work beside traffic, a protective wall system shall be provided as necessary to contain the Work as necessary. Together, these items shall be referred to as the temporary protective systems. The Contractor shall be responsible for the design, supply, installation, maintenance and removal of the temporary protective systems.

(g) The systems shall include but not necessarily be limited to platforms beneath the deck and existing girders or other areas where work is being completed to collect and contain products of structural steel removal, surface preparation, structural steel installation and coatings and all other debris, and prevent it from falling onto underlying surfaces or into the river.

(h) The protective systems shall be designed and constructed as required to catch and retain all products associated with the replacement of structural steel components and surface preparation.

(i) The Contractor is advised that construction work including but not limited to: dismantling, general demolition and removals, surface preparation, structural steel installation, bearing installation, and related construction works will be occurring in close proximity to the travelling public, over the Assiniboine River and over the Assiniboine River pedestrian path.

E7.8 Quality Control and Assurance

E7.8.1 Quality Control

(a) All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through to final acceptance of the 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.

(c) Quality Assurance testing shall be undertaken by the Contract Administrator. Quality Control testing shall be undertaken by the Contractor.

E7.8.2 Quality Assurance

(a) All materials will be subject to physical inspection by the Contract Administrator and will be subject to rejection during the course of the Work and for the length of time as specified in the General Conditions, if, in the opinion of the Contract Administrator, the materials involved do not meet the requirements of the Drawings and this Specification.

(b) All materials shall be subject to testing by the Contract Administrator and will be approved only if the requirements of the Drawings, Standards and this Specification are met. The Contractor shall supply the specimens for testing in accordance with the requests of the Contract Administrator.

(c) The Contractor shall furnish facilities for the inspection of material and workmanship in the mill, shop and field, and the Contract Administrator shall be allowed free access to the necessary parts of the Works. 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.

E7.9 Measurement and Payment

(a) Design, supply, installation, maintenance and removal of temporary protective systems will not be measured. This Item of Work shall be paid for at the Contract Lump Sum Price for “Temporary Protective Systems/Work Platform”, which price shall be payment in full for

supplying all materials / equipment and for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E8. TEMPORARY JACKING OF SUPERSTRUCTURE

E8.1 Description

E8.1.1 This Specification shall cover all operations related to bridge superstructure jacking and supporting as specified herein and indicated on the Drawings.

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 completion of all Work as hereinafter specified.

E8.2 References

E8.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

(a) Specification E9, Structural Steel Removals

(b) Specification E11, Erection of Structural Steel

(c) Specification E12, Surface Preparation and Structural Steel Coatings

(d) Specification E13, Bridge Bearing Refurbishment

E8.3 Scope of Work

E8.3.1 The Work under this Specification shall involve:

(a) Temporary shoring and jacking shall be provided as required to undertake the west exterior steel girder and bearing rehabilitation, and associated works in accordance with the details shown on the Drawings.

(b) Raising the westmost two girders of the superstructure at the south abutment and piers 1, 2 and 3, is intended to permit the Contractor to carry-out the following works on the west exterior girder:

(i) Removal and replacement of the top plates of the existing bearings at pier 1 and pier 2;

(ii) Remove and replace the bearing sole plates at piers 1 and 2;

(iii) Remove and replace the steel girder cover plates;

(c) Installation and removal of temporary girder bracing

(d) Installation of temporary jack support system at south abutment.

(e) Jacking points and allowable loads are provided on the Drawings. The Contractor will be responsible for the final choice and design of the shoring and jacking system that is acceptable to the Contract Administrator.

E8.4 Submittals

(a) The Contractor shall submit to the Contract Administrator, at least fourteen (14) calendar days prior to commencement of any jacking and supporting operation, detailed drawings of the Contractor's proposed jacking and supporting system, equipment and procedures. The detailed plans shall be designed by, prepared by, and bear the seal of a Professional Engineer (Design Engineer), registered to practice in the Province of Manitoba. The detailed drawings shall include, but not be limited to:

(i) type, number and location of jacks and all other equipment and structures to be used for jacking;

(ii) details of standby jacking, and supporting equipment (including provisions for allowing normal expansion / contraction movements of the bridge superstructure);

(iii) jacking loads;

(iv) south abutment jack support system;

(v) superstructure support details; and

(vi) procedures and sequence of work for jacking up and supporting the bridge superstructure and transferring of load onto the bearing assemblies.

(b) The submission of the detailed drawings will in no way relieve the Contractor of the full responsibility for the design and proper operation of the jacking and supporting system. The Contractor's Design Engineer shall be responsible for visiting the site as often as is necessary to inspect the jacking and supporting equipment and procedures so as to ensure that the work is carried out in accordance with the Design Engineer's sealed detailed drawings. The Contractor shall provide the Contract Administrator with a letter bearing the seal of the Design Engineer, certifying after personal inspection of the work that the jacking and supporting is being carried out in accordance with the sealed detailed drawings.

E8.5 Materials

E8.5.1 General

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

(b) 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.

E8.6 Equipment

E8.6.1 General

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

E8.6.2 Jacking System

(a) The jacking system shall be capable of jacking the superstructure simultaneously, uniformly and equally at the abutments and piers. The jacking system shall also be capable of releasing load, lowering the bridge superstructure and transferring load to the bearings simultaneously, uniformly and equally.

(b) The Contractor shall have adequate standby jacking and supporting equipment at the site prior to starting any jacking in order to ensure that bridge superstructure jacking and supporting is continuous, timely and achieved without interruption.

(c) The Contractor shall ensure the jacking system can accommodate the differences between the pier tops at the bearings as shown on the drawings as well as any irregularities or depressions on the concrete surfaces.

(d) The jacking system will include temporary support system to support jacks and from which to jack against at south abutment. The Contractor shall consider configuration and access at the south abutment as well as existing site conditions including the presence of large diameter rip rap.

E8.7 Construction Methods

E8.7.1 Sequence of Work

(a) Jacking shall only occur after the temporary traffic management plan is in operation; and

(b) The temporary girder bracing has been installed and approved by the Contract Administrator.

E8.7.2 All bearings on the two most westerly girders at the south abutment and piers 1, 2 and 3 shall be jacked concurrently.

(a) Maximum lift height shall be as identified on the drawings.

(b) Girder bracing to be installed prior to jacking.

(c) Final lift of interior girder at all locations to be one half of the lift of exterior girder.

(d) The Contractor shall be prepared for the girders to shift horizontally during jacking.

(e) After jacking, superstructure is to be supported by mechanical means.

E8.7.3 Jacking and temporary supporting operations shall be undertaken in such a manner to prevent distortion and provide lift of the superstructure as stated on the drawings. The Contractor shall jack up and lower the superstructure simultaneously and uniformly.

E8.7.4 Monitoring jack extension alone is not sufficient for maintaining elevation control – deflection of jack supports must also be accounted for.

E8.7.5 Jacks and supporting structures shall have a minimum safe working load at least one hundred and fifty percent (150%) of the expected jacking forces.

E8.7.6 The Contractor shall limit the jacking lift to the values indicated on the drawings. Any deviation from this will require approval of the Contract Administrator.

E8.7.7 The Contractor shall locate the jacking and supporting equipment such that it does not interfere with the required construction operations. After jacking, blocking can be erected for temporary support. Blocking shall be erected immediately adjacent to each side of each jacking bearing plate. The total bearing area of blocking per jacking point shall be, at minimum, equal to the area of the jacking bearing plate.

E8.7.8 Prior to jacking the Contractor shall establish and have in place a method of defining and measuring the elevation of the underside of the girders relative to a fixed point on the substructure unit immediately below. Monitoring points shall be provided under each girder.

E8.7.9 The Contractor shall be responsible for taking these measurements in the presence of the Contract Administrator. The following measurements shall be done to monitor the rate and amount of jacking and to establish the vertical location of the bridge superstructure at completion of all works.

(a) Prior to jacking;

(b) At completion of jacking;

(c) After jack release, lowering the bridge superstructure and transferring of load onto bearing assemblies.

E8.7.10 The Contractor's temporary supports shall be designed for and must be capable of allowing the normal expansion / contraction movements of the bridge superstructure to take place while they are being used.

E8.7.11 The shoring and jacking design shall include provision of lateral restraint to the superstructure.

E8.7.12 Sequence of Work

(a) Install temporary girder bracing.

(b) Install temporary jack support system at south abutment.

(c) After jacking the superstructure at the abutment and piers, perform all operations as per the Drawings.

E8.8 Quality Control and Assurance

E8.8.1 Quality Control

(a) All workmanship and all materials furnished and supplied under this Specification are

(b) 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.

(c) 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.

(d) Quality Assurance testing shall be undertaken by the Contract Administrator. Quality Control testing shall be undertaken by the Contractor.

E8.8.2 Quality Assurance

(a) All materials will be subject to physical inspection by the Contract Administrator and will be subject to rejection during the course of the Work and for the length of time as specified in the General Conditions, if, in the opinion of the Contract Administrator, the materials involved do not meet the requirements of the Drawings and this Specification.

(b) All materials shall be subject to testing by the Contract Administrator and will be approved only if the requirements of the Drawings, Standards and this Specification are met. The Contractor shall supply the specimens for testing in accordance with the requests of the Contract Administrator.

(c) The Contractor shall furnish facilities for the inspection of material and workmanship in the mill, shop and field, and the Contract Administrator shall be allowed free access to the necessary parts of the Works. 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.

E8.9 Measurement and Payment

(a) Jacking and supporting of the bridge superstructure will not be measured. Jacking and supporting of the bridge superstructure will be paid for at the Contract Lump Sum Price for "Temporary Superstructure Jacking and Support System", which price, with the exception of temporary girder bracing, shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator. Temporary girder bracing will be considered separately and paid for in accordance with E10 and E11.

E9. STRUCTURAL STEEL REMOVALS

E9.1 Description

E9.1.1 This Specification shall cover all operations relating to:

(a) The removal and disposal of miscellaneous existing bridge components, as specified herein and as shown on the Drawings.

(b) Structural removal Works, including all necessary staging, demolition, removal, salvaging, transporting, unloading, stockpiling, dismantlement, and disposal of applicable materials.

E9.1.2 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.

E9.2 References

E9.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

(a) E3 Traffic Control;

(b) E4 Traffic Management;

(c) E5 Pedestrian Safety;

(d) ICRI Guideline No. 03732.

E9.3 Details of the Existing Structure

(a) Applicable details and structure dimensions of the existing structures are shown on the Drawings for information only in establishing the methods and limits of Work.

(b) The information shown has been obtained from existing Drawings, measurements, and observations at the Site. The accuracy of this information is not guaranteed and the Contractor must verify all information before commencing Work.

(c) Lead in paint chip by flame atomic absorption spectroscopy analytical results of surface paint coatings samples collected from the west girder of Pier 2, 4, and 5 report lead content ranging from 0.085 % wt (3,300 ppm) to 0.33% wt (850 ppm). Please consider all paint on existing structural steel to be lead containing.

E9.4 Scope of Work

E9.4.1 The Work under this Specification shall specifically include the following items to the limits as shown on the Drawings or as otherwise directed by the Contract Administrator:

(a) Steel Removals as follows:

(i) Complete removal and disposal of existing bridge girder flange cover plates;

(ii) Complete removal and disposal of bridge girder sole plates; and

(iii) Complete removal and disposal of bridge bearing top plate.

The Contractor shall be aware of the presence of lead paint on the existing structural steel components and bolts

(b) Completing all structural removals with appropriate equipment satisfactory to the Contract Administrator. No demolition products shall find their way onto the pedestrian pathway or roadway lane which shall remain open to traffic. Under no circumstances shall demolition products find their way into the watercourse.

(c) Complying with any and all environmental requirements identified in the Specifications or otherwise applicable to the proposed Works;

(d) All materials not identified for salvage shall be disposed of at an approved disposal facility by the Contractor. Any disposal fees shall be considered incidental to this Work.

E9.5 Submittals

E9.5.1 General

(a) The Contractor shall submit to the Contract Administrator for review and approval, at least ten (10) Business Days prior to the commencement of any removal Works on Site, a detailed removal plan and schedule clearly illustrating the method and sequence by which the Contractor proposes to perform the structural removals including a description of the measures that will be implemented to meet the applicable environmental or other Federal, Provincial or Municipal regulatory requirements whether identified or not. The removal procedure shall include Detailed Design notes and Shop Drawings that are sealed, signed, and dated by a Professional Engineer licensed to practice in the Province of Manitoba necessary for the following proposed items:

(i) Work platforms (suspended from the existing superstructure, supported from the existing ground, or otherwise);
(ii) Type and capacity of removal equipment;
(iii) Sequence of removal operations;
(iv) Fencing plan to prevent public access .
(v) Design of demolition catch platforms (if different than work platforms) to contain all removal/demolition debris from entering into the watercourse below;

E9.6 Materials

E9.6.1 General

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

E9.6.2 Demolition Catch Platforms and Work Platforms

(a) Shall be in accordance with E7 Temporary Protection Systems.

E9.7 Equipment

E9.7.1 General

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

E9.7.2 Demolition Barriers

(a) The Contractor shall provide all necessary temporary barriers and fencing to protect the general public from the products of the demolition process. The barriers shall not impede the removal process or associated inspection of all Works by the Contract Administrator.

E9.7.3 Sequence Of Structural Removals

(a) Construction sequencing of all structural removals shall take place as shown on the Drawings or as accepted by the Contract Administrator.

E9.8 Construction Methods

E9.8.1 General

(a) Structural removals shall be deemed to include all the items of work as listed within this Specification and to the limits as shown on the Contract Drawings or otherwise directed by the Contract Administrator.

(b) Contractor shall perform lead abatement for any operations that involve the removal of paint coatings for surface preparation or other purpose on existing structure.

(c) Lead-containing surfaces that will be impacted by renovation or repair activities in a manner likely to cause some level of airborne lead-containing dust or fumes, (i.e., manual scraping/demolition, welding, torch cutting, grinding, sanding or sandblasting) should be assessed for risk prior to disturbance and controlled through the development and implementation of an Exposure Control Plan. A Lead Exposure Control Plan should include safe work procedures to address the lead exposure hazard during the abatement (paint removal) activities. The safe work procedures should include procedures to minimize dust during removal, procedures for proper containment, collection, clean-up and disposal of waste/debris to prevent contamination in other areas, the use of proper cleaning tools, selection and use of proper personal protective equipment, and other applicable procedures.

(d) In the absence of provincial lead abatement guideline document, consideration can be given to adopting the standards and procedures outlined in the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair (October 2014).

(e) Prior to disposal, lead paint abatement waste should be tested for leachable lead following toxicity characteristic leaching procedure (TCLP) for waste characterization purposes.

(f) The Contractor shall be fully responsible for ensuring the Public safety in all areas, and will be held responsible for any loss or damage caused due to neglect by the Contractor or his employees.

(g) The Contractor shall provide flagmen, guards, barricades, railings, fencing and necessary warning lights, and whenever/wherever necessary, warning signs and lights at the excavations, temporary sidewalks, removals, and/or other construction, to secure the safety of workmen and the Public. The safety precautions shall comply with all Provincial Statutes applicable to the Work. The Contractor shall provide all other protective measures as may be required by any Law in force in Manitoba and the Canada Labour Code.

(h) Traffic and pedestrian control shall conform to the requirements of E3 “Traffic Control”, E4 “Traffic Management” and E5 “Pedestrian Safety”.

(i) Under no circumstances shall the Contractor close any portion of existing roadways or walkways to traffic without prior written approval of the Contract Administrator. If any existing roadway is to be closed to traffic in no case shall the Contractor commence any construction operations until such time that all the signs, barricades, and flashers have been erected to the satisfaction of the Contract Administrator.

(j) The Contractor shall generally prevent any unspecified and undesirable movement or settlement of the existing structure, damage to any existing structures to remain, and damage to any services, paving, trees, landscaping and adjacent grades not specified for removal/disturbance. In addition to that specified or shown on the drawings, the Contractor shall design and provide any additional bracing, shoring or underpinning necessary to complete the work as required and shall have any designs for this Work sealed, signed and dated by a Professional Engineer licensed to practice in the Province of Manitoba. If the safety of the structure and/or existing services appears to be endangered during structural removal operations or if the Work is detrimentally impacting the environment, the Contractor shall cease operations and notify the Contract Administrator immediately. Additionally, if the Work is proceeding in a fashion unsatisfactory to the Contract Administrator for any reason, the Contractor will be notified and shall cease operations immediately.

(k) In no case will the Contractor be permitted to use removal equipment, or other equipment or methods which may cause damage to any remaining structural components or to any new construction. In the event that any component is damaged, the Contractor shall repair such component at his own expense to the satisfaction of the Contract Administrator.

(l) All removed material shall become the responsibility of the Contractor except as otherwise indicated herein.

(m) The Contractor shall promptly haul all removed materials indicated for disposal, off and away from the site. No storage of any materials on Site will be allowed without written approval of the Contract Administrator. It shall be the Contractor’s responsibility to find suitable disposal areas away from the Site.

(n) The Contractor shall take all necessary precautions to ensure that materials do not fall onto any neighboring roadways or sidewalks during removal operations.

(o) The Contractor shall visit the Site to become familiar with the existing conditions and scope of work prior to bid submission. No allowance for extras will be made for any structural removals, not foreseen by the Contractor, required to complete the scope of Work.

(p) The Contractor shall be fully responsible for ensuring the public safety in all areas, and will be held responsible for any loss or damage caused due to neglect by the Contractor or his employees.

E9.8.2 Steel Removals

(a) Upon jacking and shoring of the superstructure as per E8 Temporary Jacking of Superstructure, and installing the temporary cross bracing, the Contractor shall remove and dispose of the existing bridge bearing top plates, girder sole plates, girder cover plates and bolts.

(b) The Contractor shall only use methods of steel removal that will not damage the existing structure to remain or new structures.

(c) Removal of welds on existing girder sole plates shall be in a manner acceptable to the Contract Administrator.

E9.8.3 Waste Handling and Disposal of Removed Materials

(a) Dispose of all surplus and unsuitable material off-site in accordance with appropriate Federal, Provincial or Municipal regulatory requirements. Wherever practical, the Contractor shall recycle disposed materials.

(b) The Contractor shall submit a list of locations of disposal / recycling for all removed materials to the Contract Administrator.

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

E9.8.4 Construction Load Limitations for Equipment

E9.9 The Contractor shall restrict load and position of equipment and material to be located on the superstructure deck or suspended from it to be as stated on the drawings.

E9.10 Quality Control and Assurance

E9.10.1 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.

E9.10.2 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.

E9.11 Measurement and Payment

E9.11.1 Structural Removals

(a) Structural removals will not be measured. Structural Removals will be considered incidental to "Erection of Structural Steel" and "Bridge Bearing Refurbishment" which price shall be payment in full for supplying all materials / equipment and for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E10. SUPPLY AND DELIVERY OF STRUCTURAL STEEL

E10.1 Description

E10.1.1 This Specification shall cover the supply, fabrication, transportation, and handling of the structural steel cover plates, girder sole plates, bridge bearing top plates and retainer bars, temporary girder bracing, and all incidental structural steel elements, components and fasteners as specified herein and as shown on the Drawings.

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, handling and storage, and all things necessary for and incidental to the satisfactory performance and completion of all Work as herein specified and as indicated on the Drawings.

E10.2 References

E10.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

(a) CAN/CSA G40.20/G40.21 - General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels

(b) CAN/CSA S16 - Design of Steel Structures

(c) CAN/CSA W47.1 - Certification of Companies for Fusion Welding of Steel Structures

(d) CAN/CSA W48 - Filler Metals and Allied Material for Metal Arc Welding

(e) CAN/CSA W59 - Welded Steel Construction (Metal Arc Welding)

(f) CAN/CSA W178.1 - Certification of Welding Inspection Organizations

(g) CAN/CSA W178.2 - Certification of Welding Inspectors

(h) Canadian Institute of Steel Construction (CISC) - Handbook of Steel Construction

(i) CGSB 48.9712 - Non-destructive Testing Qualifications and Certification of Personnel

(j) ANSI B46.1 - Surface Texture (Surface Roughness, Waviness and Lay)

(k) ASTM F3125 - Grade A325 Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

(l) ASTM F3125M - Grade A325M Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric)

(m) ASTM A563/A563M - Carbon and Alloy Steel Nuts

(n) ASTM A588/A588M - High-Strength Low-Alloy Structural Steel, up to 50 ksi (345 MPa) Minimum Yield Point, with Atmospheric Corrosion Resistance

(o) ASTM F436/F436M - Hardened Steel Washers

(p) AWS A5.XX XX - All Applicable Filler Metal Specifications

(q) AWS D1.1/D1.1M - Structural Welding Code Steel

(r) AWS D1.5/D1.5M - Bridge Welding Code

(s) ISO/IEC 17025:1999 - General Requirements for the Competence of the Testing and Calibration Laboratories

E10.3 Submittals

E10.3.1 The Contractor shall submit the following to the Contract Administrator for approval prior to commencing fabrication in accordance with the Specification:

(a) Design calculations and shop drawings for all structural steel components as specified in E6 Shop Drawings and shall bear the seal of a Professional Engineer registered in the province of Manitoba.

(b) Further to E6 Shop Drawings, shop drawings submitted for review shall include the following:

(i) Full detail dimensions and sizes of all component parts of the structure. Components shall be detailed to compensate for changes in shape due to weld shrinkage, camber, and any other effects that cause finished dimensions to differ from initial dimensions;

(ii) Erection marks to uniquely identify all fabricated components;

(iii) All necessary specifications for the materials to be used;

(iv) Identification of areas requiring special surface treatment;

(v) Identification of slip critical surfaces;

(vi) Bolt installation requirements, including number of fitting up bolts and drift pins required at each connection and oversized and slotted holes;

(vii) Details of all welds;

(viii) Temporary welds; and,

(ix) Location of shop welded and field welded and bolted splices;

(c) An Erection Diagram that is stamped, signed and dated by a Professional Engineer registered or licensed to practice in the Province of Manitoba and includes at least the following:

(i) Principal dimensions of the bridge;

(ii) Erection marks;

(iii) Sizes of all members;

(iv) Size and type of bolts;

(v) Bolt installation requirements, including the number of fitting up bolts and drift pins required at each connection and identification of oversize and slotted holes;

(vi) Bracing and all other temporary works required for erection of structural steel; and,

(vii) Treatment at faying surfaces for joints designed as slip critical.

(d) Proposed welding procedures conforming to AWS D1.5 or CAN/CSA W59 and CAN/CSA W47.1 to be used in fabricating the various components. The following shall be included in the submitted welding procedures:

(i) The welding process, position of weld, filler metal, flux, shielding gas if required, joint configurations, number and size of passes, preheat and inter-pass temperatures if required, sequence of passes, current, rate of pass, electrode size, electrical stick-out and polarity;

(ii) Methods proposed for edge preparation;

(iii) Measures proposed to control distortion, shrinkage and residual stresses;

(iv) Proposed methods and sequence of assembly; and,

(v) Welding equipment to be used.

(e) Mill test certificates showing chemical analysis and physical tests of all structural steel shall be submitted to the Contract Administrator for review prior to commencement of fabrication. In addition to the submission of the mill test certificates, the following shall be submitted:

(i) Mill test certification for all material to be used in the fabrication shall be available for review at the fabricating plant during fabrication;

(ii) If material cannot be identified by mill test certificates, coupons shall be taken and tested and these test certificates shall be made available; and,

(iii) Where mill test certificates originate from a mill outside Canada or the United States of America, the Contractor shall have the

information on the mill test certificate verified by independent testing by a Canadian laboratory. This laboratory shall be certified by an organization accredited by the Standards Council of Canada to comply with the requirements of ISO/IEC 17025 for the specific tests or type of tests required by the material standard specified on the mill test certificate. The mill test certificates shall be stamped with the name of the Canadian laboratory and appropriate working stating that the material is in conformance with the specified requirements. The stamp shall include the appropriate material specification number, testing date, and the signature of an authorized officer of the Canadian laboratory.

(f) Proof shall be submitted to the Contract Administrator demonstrating that the bolts, nuts, and washers meet the chemical composition, mechanical properties, dimensions, workmanship, and head burst as required by F3125/F3125M Grade A325/A325M, A563/A563M or F436/F436M. Verification of the acceptability of assemblage of zinc coated bolts shall be provided with the bolts, nuts, and washers delivered to the job site shall also be submitted to the Contract Administrator.

(g) For bolts supplied from a manufacturer outside Canada or the United States of America, the above information shall be independently verified by testing by a Canadian laboratory as outlined in E10.3.1e.

(h) Repair procedures, if required, for repair of fabricating defects or other damage to structural steel components.

E10.4 Materials

E10.4.1 General

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

E10.4.2 Structural Steel

(a) Structural steel shall be new and of the grade and category specified on the Drawings and in this Specification and shall be in accordance with CAN/CSA G40.20/G40.21.

(b) Substitution of material for size and grade is not permitted unless approved in writing by the Contract Administrator.

E10.4.3 High Strength Bolts, Nuts, and Washers

(a) High strength bolts, nuts, and hardened washers shall be in accordance with ASTM F3125/F3125M Grade A325/A325M, A563/A563M, and F436/F436M. The nuts, bolts, and washers shall be shipped together as an assembly.

(b) Permanent bolts, nuts, and washers used shall be hot dipped galvanized Type 1.

(c) Galvanized fastener nuts shall be over-tapped by the minimum amount required for assembly and shall be lubricated with a lubricant containing a visible dye.

E10.4.4 Welding Consumables

(a) The selection, supply, and storage of electrodes for SMAW and fluxes for SAW shall be according to CAN/CSA W59 requirements. Only controlled hydrogen designation electrodes and low hydrogen wire consumables shall be used for the SMAW and flux- cored arc welding processes, respectively. Electrodes and fluxes shall be strictly stored and maintained as required by CAN/CSA W59, section 5.2.

(b) Weld metal used with corrosion resistant steels shall have similar corrosion resistance and color to the base metal and shall be supplied according to CAN/CSA W59.

E10.4.5 Bill of Materials

The Bill of Material shown in Table E10.1 is based on available drawings and is not considered final. The Contractor shall measure and adjust the dimensions of material including length and quantity of bolts to replicate the similar components being replaced on the existing structure.

Location	Description	Dimensions (mm)	Required Surface Treatment	Mass/unit (kg)	Qty	Total (kg)
Bearing	Mk. 10 Sole Plate	PL610x540x25	Metalized	66	1	66.00
Bearing	Mk. 10 Steel Top Plate	PL560x490x25	Metalized	55	1	55.00
Bearing	Mk. 11 Sole Plate	PL770x570x25	Metalized	88	1	88.00
Bearing	Mk. 11 Steel Top Plate	PL720x520x25	Metalized	75	1	75.00
Bearing	Mk. 11 Keeper Bar	410 long	Metalized	4.2	2	8.40
Temporary Lateral Bracing	Horizontal Angles 'L1'	2L102x102x9.5	N/A	122	16	1,953.00
Temporary Lateral Bracing	Horizontal Angles 'L2'	2L102x102x9.5	N/A	122	16	1,953.00
Temporary Lateral Bracing	Diagonal Angles 'L3'	2L102x102x9.5	N/A	83	32	2,670.00
Temporary Lateral Bracing	Gusset Plate 'P1'	PL625x360x13	N/A	22	16	352.00
Temporary Lateral Bracing	Gusset Plate 'P2'	PL360x200x13	N/A	7.2	32	230.40
Temporary Lateral Bracing	Gusset Plate 'P3'	PL562x410x13	N/A	23	16	368.00
Temporary Lateral Bracing	Gusset Plate 'P4'	PL590x360x13	N/A	21	16	336.00
Temporary Lateral Bracing	Spacer between angles	PL75x75x10	N/A	0.4	272	108.80
Temporary Lateral Bracing	Gusset PL-stiffener bolts	22 dia, 64 long	N/A	0.429	400	171.64
Temporary Lateral Bracing	Gusset PL or stiffener-double angle bolts	22 dia, 70 long	N/A	0.448	768	344.18
Flange Cover Plate	Highest of Three New Plates	PL457x16, 11 764 long	Termarust	676	2	1,352.00
Flange Cover Plate	Second Lowest of Three New Plates	PL457x13, 11 764 long	Termarust	536	2	1,072.00
Flange Cover Plate	Lowest of the Three New Plates	PL457x13, 8 080 long	Termarust	365	2	730.00
Flange Cover Plate	Flange + 2 PLs bolts	22 dia, 89 long	Galvanized	0.503	608	306.13
Flange Cover Plate	Flange + 3 PLs bolts	22 dia, 102 long	Galvanized	0.544	348	189.42
Note: Bolts under shoe plate (qty 24) may need to be longer than 102mm. To be confirmed.						**12,428.98**

Table E10.1: Bill of Material

E10.4.6 Replacement of Damaged Materials

(a) All material supplied by the Fabricator that in the opinion of the Contract Administrator has been damaged or otherwise rendered unusable by improper storage or handling by the Contractor shall be replaced by the Contractor at his expense.

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 Material Preparation

(a) Straightening Material

(i) All steel shall be flat and straight according to the specified mill tolerances before commencement of fabrication. Material with sharp kinks or bends shall only be straightened with the approval of the Contract Administrator. The Contractor shall submit written procedures for approval to the Contract Administrator and shall not commence straightening work until he has received permission from the Contract Administrator.

(ii) When straightening is approved, material may be straightened using mechanical means or by the application of controlled heating according to CAN/CSA W59.

(iii) Details of the method of straightening shall be according to CAN/CSA W59 and submitted to the Contract Administrator two (2) weeks prior to the Contractor arranging for inspection of the straightened material and non-destructive testing.

(iv) The Contract Administrator shall be given one (1) week notice to arrange for their inspections.

(b) Edge Preparation

(i) Sheared edges of plates with a 16 mm thickness or greater and that carry calculated tension shall have 3 mm of edge material removed by planing, milling or grinding.

(ii) Oxygen cutting of structural steel shall be done by machine except hand-guided cutting will be allowed for copes, blocks and similar cuts where machine cutting is impractical. Re-entrant corners shall be ground smooth and shall have a fillet of the largest practical radius, but in no case shall the radius be less than 25 mm.

(iii) Plasma arc cutting shall only be done when approved in writing by the Contract Administrator. All nitrogen plasma arc cut edges shall be ground back by 0.5 mm when welding will be carried out on these edges.

(iv) The quality of the cut edges and their repair shall be according to CAN/CSA W59. All cut edges that are not to be welded shall have a surface roughness not greater than 1000 as defined by CAN/CSA B95. Edges of all flanges shall be rounded to a 1.5 mm radius by grinding. In addition, all edges of all members and plates exposed to view or weather in the finished assembly shall be rounded to a 1.5 mm radius by grinding.

(v) All steel edges that will be painted whether resulting from rolling, cutting or, shearing operations shall be rounded to a 1.5 mm radius by grinding prior to blast cleaning.

(vi) The Brinell hardness of the edges of flanges plates for fracture critical or primary tension members shall not exceed 220. If the measured hardness exceeds 220, the edges shall be ground to remove the harder layer or annealed by means of a preheating torch.

(c) Direction of Rolling

(i) Steel plate for main members shall be cut so that the primary direction of rolling is parallel to the direction of tensile or compressive stress.

(d) Bolt Holes

(i) Hole Size

1. The nominal diameter of a hole other than oversize or slotted holes shall not be more than 2 mm greater than the nominal bolt size with the exception of the following bolt and hole combinations:

   (a) either a 19 mm (3/4") or an M20 bolt in a 22 mm hole;

   (b) either a 22 mm (7/8") or an M22 bolt in a 24 mm hole; and,

   (c) either a 25 mm (1") bolt or an M24 bolt in a 27 mm hole.

2. Unless otherwise approved by the Contract Administrator, oversize or slotted holes shall only be used when specified on the Drawings or in the Specification. Non-specified oversize or slotted holes will only be considered for use in bracing and diaphragms.

3. Oversize holes when permitted shall not be more than 4 mm larger than the nominal bolt size for bolts 22 mm or less in diameter; 6 mm larger than the nominal bolt size for bolts

between 23 and 26 mm in diameter; and 8 mm larger than the nominal bolt size for bolts 27 mm and greater in diameter.

(ii) Punched Holes

1. Holes shall only be punched to finish size in material 16 mm or less in thickness.
2. The diameter of a hole punched to finish size shall not be more than 2 mm larger than the nominal diameter of the bolt unless oversize holes are approved.
3. The diameter of the die shall not exceed the diameter of the punch by more than 2 mm. Holes shall be clean cut without ragged or torn edges. Sharp edges shall be ground smooth without reducing the cross-section of the member. The slightly conical hole that results from this operation is acceptable.

(iii) Drilled Holes

1. Holes which are drilled to finished diameter shall be 2 mm larger than the nominal diameter of the bolt unless oversize or slotted holes have been specified. Holes to be drilled shall be accurately located by using suitable numerically-controlled drilling equipment, or by using a steel template carefully positioned and clamped to the steel. The dimensional accuracy of holes and locations prepared in this manner shall be such that like parts are exact duplicates and require no match marking.
2. The holes for any connection may be drilled to the required finished diameter when the connecting parts are assembled and clamped in position, in which case the parts shall be match-marked before disassembling.
3. Cover plate holes shall be field drilled in place. Cover plate to be securely fastened to the girder prior to drilling. Bolt holes may be shifted slightly to avoid conflicts.

(iv) Drilled and Tapped Holes

1. Girder sole plate holes to be drilled and tapped to connect bearing top plate.
2. Bearing top plate to be drilled and tapped to connect keeper bars.

(v) Reamed Holes

1. Holes which are to be reamed to the specified finished diameter shall first be sub-drilled or sub-punched to 4 mm less than the finished hole diameter. The holes shall be reamed to 2 mm larger than the nominal diameter of the bolts with connecting parts assembled and securely held in place during reaming. The connecting parts shall be match-marked before disassembling. Reamed holes shall be truly cylindrical and perpendicular to the member. All burrs shall be removed without reducing the cross section of the member.

(vi) Tolerances

1. Center to Center 12 m or less: +/- 1.0 mm
2. Center to Center 12 to 18 m: +/- 1.5 mm
3. Center to Center 18 to 24 m: +/- 2.5 mm
4. Center to Center over 24 m: +/- 3.0 mm

(vii) Bent Plates

1. General

(a) Rolled steel plates to be bent shall be cut from the stock plates so that the bend line is at right angles to

the direction of rolling except as otherwise approved for orthotropic decks.

(b) Before bending, the edges of the plate within the bend region shall be rounded to a 3 mm radius by grinding in the region of the bend.

2. Cold Bending

(a) Cold bending shall be carried out in such a manner that no cracking or tearing of the plate occurs. Minimum bend radii for various plate thicknesses (t), measured to the concave face of the metal shall be in accordance with Table E10.2.:

TABLE E10.2

t (mm)	Radius (mm)
t ≤ 12	2t
12 ≤ t ≤ 25	2.5t
25 ≤ t ≤ 38	3t
38 ≤ t ≤ 65	3.5t
65 ≤ t ≤ 100	4t

3. Hot Bending

(a) Forming radii less than that permitted for cold bending shall be done by hot bending at a plate temperature not greater than 600°C. Accelerated cooling of a hot bent component will only be permitted when the temperature of the component is below 300°C. Only compressed air or water shall be used for accelerated cooling.

(i) Faying Surfaces

1. All faying surfaces shall be cleaned by sand blasting in the shop for new components and in the field for existing steel components.
2. All faying surfaces between cover plates and between cover plates and existing steel girder flanges shall be considered slip critical.
3. All faying surfaces on temporary girder bracing and between temporary girder bracing and existing stiffeners shall be considered slip critical.

(ii) Marking

4. Each member shall carry a unique erection mark for identification.
5. Permanent marking shall be affixed in an area not exposed to view in the finished structure.

(iii) Temporary Works

6. Temporary welds shall not be used on fracture-critical and primary tension members.
7. Temporary welds shall not be used on flange material in compression unless approved by the Contract Administrator.

E10.6.2 Welded Fabrication

(a) Fabrication Company Certification

(i) The company or companies undertaking welded fabrication shall be certified according to CAN/CSA W47.1, Division 1 or Division 2.

(b) Assembly

(i) Assembly shall be according to AWS D1.5 or CSA W59 and the following:

1. Girder sole plate welding shall be completed under full dead load.

(ii) Non-Critical Repairs

1. Repairs that may be classified as non-critical are as follows:

(a) The repair of welds because of rollover, undercut, or insufficient throat; those requiring excavation of defects including porosity, slag, and lack of fusion; the repair of arc strikes; and removal of tack welds not incorporated into a final weld;

(b) Visually detected planar and laminar discontinuities as defined in CAN/CSA W59, Table 5-2 but not deeper than 25 mm, or half of the thickness of the edge of the cut plate, whichever is less; and such discontinuities shall not be within 300 mm of a tension groove weld.

(c) There shall also be no visible planar or laminar discontinuity on any prepared face of a tensioned groove joint prior to welding;

(d) Gouges not more than 5 mm deep on otherwise satisfactory cut or rolled surfaces that may be repaired by machining or grinding without welding; and

(e) Occasional gouges that may be repaired by welding, exceeding 5 mm but not more than 10 mm in depth on edges not to be welded.

2. Work on non-critical repair shall not commence until the Contract Administrator has verified that the repair is a non-critical repair and has given written approval to proceed. The repair of gouges not more than 5 mm on otherwise satisfactory cut or rolled surfaces that may be repaired by machining or grinding without welding does not require prior approval.

(iii) Critical Repairs

1. Repair procedures for more severe conditions than those described for non- critical repairs are considered critical and shall be individually approved by the Contract Administrator before repair welding is begun.

2. Critical repairs include the following:

(a) Repair of lamellar tearing, laminations, and cracks;

(e) Repair of surface and internal defects in rolled products;

(f) Dimensional corrections requiring weld removal and rewelding; and,

(g) Any correction by welding to compensate for a fabrication error such as improper cutting, punching, or incorrect assembly other than tack welded or temporary assemblies.

(iv) Repair Procedures

1. Repair procedures shall be submitted to the Contract Administrator at least two weeks prior to commencement of repair work and shall include sketches or full size drawings as

necessary to adequately describe the deficiency and the proposed method of repair.

2. Procedures for critical repairs shall also include the location of the discontinuity.
3. Repair procedures shall include the minimum following provisions. The steps shall be listed in the order to be performed.
4. Surfaces shall be cleaned and ground as necessary to aid visual and nondestructive tests to identify and quantify the discontinuities.
5. The discontinuity shall be drawn as it appears from visual inspection non-destructive testing.
6. Arc-air gouging, shall be part of the approved welding procedure when required.
7. Magnetic particle inspection or another inspection method approved by the Contract Administrator shall be used to determine whether the discontinuity was removed as planned.
8. All air carbon-arc gouged and oxygen-cut surfaces that form a boundary for a repair weld shall be ground to form a smooth bright surface. Oxygen gouging is not permitted.
9. All required run-off tabs and back-up bars shall be shown in detail.
10. Preheat and interpass temperature shall be according to Table E10.3., Preheat and interpass temperatures shall be maintained without interruption until the repair is completed.

TABLE E10.3

Thickness, t (mm)	Grade, CSA G40.21 **260WT, 300WT, 350WT, 400WT,** 480WT, 350AT, 400AT, 480AT
t ≥ 25 25 ≥ t ≥ 40 T ≥ t 40	65°C 120°C 175°C

NOTE: For grade 700QT steel, preheat and interpass temperature shall be in accordance with steel manufacturer's recommendations.

11. The repair procedures shall make reference to the applicable welding procedure specification and the related data sheet. If both of these were approved by the CWB prior to fabrication, they need not be prequalified by test for the specific method of repair unless a change in essential variables has been made or unless otherwise required by the Contract Administrator.
12. If the geometry of the repair joint or if the excavation is similar to the geometry of a prequalified joint preparation as defined in CAN/CSA W59, and permits good access to all portions of such joints or excavations during the proposed sequence of welding, the welding procedure shall not require prequalification by test unless required by the Contract Administrator.
13. Peening shall be noted as part of the approved procedure when required and shall be completely described. Peening

equipment shall not contaminate the joint.

14. Post-heat shall be employed and shall continue without interruption from the completion of repair welding to the end of the minimum specified post-heat period. Post-heat of the repair area shall be between 200°C and 260°C and shall be for a period of one (1) hour minimum for each 25 mm of weld thickness or for two (2) hours, whichever is less.
15. Faces of repairs shall be ground flush with the plate or blended to the same contour and throat dimension as the remaining sound weld. If stress-relief heat treatment is required, it shall be completely described. Final acceptance by nondestructive testing shall be performed after stress relief is complete. Repairs of groove welds in fracture critical members shall be examined by ultrasonic testing (UT) and radiographic testing (RT). Repairs to groove welds in primary tension members shall be examined by UT or RT. Fillet weld repairs shall be examined by magnetic particle testing (MT). MT, RT, and UT shall be according to CSA W59. RT may be performed as soon as the weld has cooled to ambient temperature; however, final acceptance by MT and UT methods shall not be performed until the steel welds have been cooled to ambient temperature for at least the elapsed time indicated in Table E10.4.

TABLE E10.4

Weld Minimum Cooling Period

Plate Thickness	Magnetic Particle for Fillet Weld	Ultrasonic Examination of Groove Welds
t ≤ 50	24 hours	24 hours
t > 50 mm	24 hours	48 hours

16. All repair welding and non-destructive testing shall be performed as described in the approved repair procedure.
17. All repair procedures for repairs requiring approval shall be retained as part of the project records.

E10.6.3 Bolted Construction

(a) General

(i) ASTM F3125/F3125M Grade A325/A325M high strength bolts shall be used for bolted connections. Bolts shall be sufficiently long to exclude threads from the shear plane.

(b) Assembly

(i) The assembly of joints shall be according to CAN/CSA S16 except that Turn-of- Nut tightening method shall be the only installation method used.

(ii) Prior to assembly, all joint surfaces, including those adjacent to bolt heads, nuts and washers, shall be free of loose scale, burrs, dirt, and foreign material.

(iii) The faying surfaces of connections identified as slip-critical connections shall be prepared as specified below.

1. For clean mill scale, the surfaces shall be free of oil, paint, lacquer, or any other coating and then blast cleaned.
2. For coated surfaces other than galvanized, the surfaces shall be free of oil, lacquer, or other deleterious coatings.
3. Hot dip galvanized surfaces shall be roughened after

galvanizing by means of hand wire brushing. Power wire brushing is not permitted.

(iv) This treatment shall apply to all areas within the bolt pattern and for a distance beyond the edge of the bolt hole that is the greater of 25 mm or the bolt diameter.

(c) Bolt Tension

(i) Pretensioned bolts shall be tightened to at least 70% of the specified minimum tensile strength given in the appropriate ASTM standard.

(d) Reuse of Bolts

(i) Bolts shall not be reused once they have been fully tightened. Bolts that have not been fully tensioned may be reused up to two times, providing that proper control on the number of reuses can be established. Retightening of bolts loosened due to the tightening of adjacent bolts is not considered to be a reuse.

(e) Hardened Washers

(i) Hardened washers shall be provided under the head and the nut of each bolt for a total of two (2) washers per bolt.

(ii) Hardened washers are required under the nut and bolt head adjacent to joint surfaces containing oversize or slotted holes.

(f) Bevelled Washers

(i) Bevelled washers shall be used to compensate for lack of parallelism where an outer face of bolted parts deviates by more than 5% from a plane normal to the bolt axis.

(g) Turn-of-Nut Tightening

(i) After aligning the holes in a joint with a properly sized drift pin, sufficient bolts shall be placed and brought to a snug-tight condition to ensure that the parts of the joint are brought into full contact with each other.

(ii) Following the initial snugging operation, bolts shall be placed in any remaining open holes and brought to snug-tightness. Resnugging may be necessary in large joints.

(iii) When all bolts are snug-tight, each bolt in the joint shall be tightened additionally by the applicable amount of relative rotation given in Table E10.5, with tightening progressing systematically from the most rigid part of the joint to its free edges. During this operation there shall be no rotation of the part not turned by the wrench. The bolt and nut shall be matched marked to enable the amount of relative rotation to be determined.

TABLE E10.5

Nut Rotation From Snug-Tight Condition

Outer Face Alignment of Bolted Parts	**Bolt Length L_b**	**Turn From Snug**
Both faces normal to bolt axis or one face normal other face sloped 1:20 max – beveled washers not used	$L_b \leq 4\ d_b$	1/3
	$4\ L_b < L_b \leq 8\ d_b$ Not exceeding 200 mm	1/2
	$8\ d_b < L_b \leq 12\ d_b$ or exceeding 200 mm but less than12 db	2/3

Both faces sloped 1:20 from normal axis – beveled washers not used.	All Bolt Lengths up to 12 d_b	3/4

NOTES:

1. Bolt diameter is indicated as d_b.
2. When bolt length exceeds 12 diameters, the required nut rotation shall be determined by actual testing in a suitable tension calibrator that simulates the condition of the solidly fitting steel.
3. Tolerance on rotation is 30 degrees over/under.
4. Table applies to coarse-thread. Heavy-hex structural bolts of all sizes and lengths used with heavy-hex semi finished nuts.
5. Bolt length is measured from the underside of the head to the extreme end point.
6. Beveled washers shall be provided when A490 or A490M bolts are used.

(h) Field Fit-up

(i) Connection holes into existing structural steel materials shall only be drilled in the field with the new structural steel firmly clamped in place.

(ii) Components shall be supported in a manner consistent with the final geometry of the bridge as specified in the Drawings.

(iii) Holes in the webs and flanges of main components shall be drilled to finished diameter while in assembly.

(i) Match Marking

(i) Connecting parts that are assembled in the shop for the purpose of reaming or drilling holes shall be match-marked. A drawing shall be prepared for field use detailing how the marked pieces shall be assembled in the field to replicate the shop assembly.

E10.6.4 Fracture Control

(a) General

(i) The provisions of this clause shall apply to members designated as fracture critical and primary tension members as identified on the Drawings or in the Specification. The Fracture Control requirements shall apply to both bolted and welded construction.

(b) Identification

(i) Shop drawings shall identify the extent of fracture critical and primary tension members.

(ii) Attachments having a length of more than 100 mm in the direction of tension and welded to the tension zone of a fracture critical or primary tension member shall be treated as part of that member.

(iii) Records shall be kept for each component of a fracture critical or primary tension member to identify the heat number of the material and its corresponding mill test certificate.

(c) Fracture Toughness Requirements

(i) The Charpy V-notch requirements given in Tables E10.6, E10.7 and E10.8 are for standard full-size specimens.

(ii) Fracture Critical Members - For fracture critical members, Charpy V- notch tests shall be specified on a

per plate frequency and the steel shall meet the impact requirements given in Table E10.6.

TABLE E10.6
Fracture Critical Member Charpy V-Notch Impact Requirements

Grade G40.21	Minimum Average Energy	Test Temperature Tt for Minimum Service Temperature Ts		
		Ts -30°C	-30°C > Ts -60°C	Ts -60°C
300WT	34 J	0°C	- 20°C	- 40°C
350WT	40 J	0°C	- 20°C	- 40°C
350AT	40 J	0°C	- 20°C	- 40°C

(iii) Primary Tension Members - For primary tension members, Charpy V- notch tests shall be specified on a per heat frequency and the steel shall meet the impact requirements given in Table E10.7.

TABLE E10.7
Primary Tension Member Charpy V-Notch Impact Requirements

Grade G40.21	Minimum Average Energy	Test Temperature Tt for Minimum Service Temperature Ts		
		Ts -30°C	-30°C > Ts -60°C	Ts -60°C
300WT	20 J	0°C	- 20°C	- 30°C
350WT	27 J	0°C	- 20°C	- 30°C

(iv) Service Temperature - The applicable minimum service temperature shall be the minimum daily mean temperature taken from “Canadian Climate Normals” published by Environment Canada.

(v) Permanent Backing Bars - Permanent backing bars shall not be used unless absolutely necessary and approved for use in writing by the Contract Administrator. Steel for permanent backing bars shall meet the requirements of clause 5.5.1.1 of CAN/CSA W59 or equivalent under AWS D1.5. and in addition, shall meet the CVN requirement of Tables E10.6 and E10.7 as appropriate.

(vi) Weld Metal Toughness - For fracture critical and primary tension members, the weld metal shall meet the impact requirements of Table E10.8.

TABLE E10.8
Weld Metal Charpy V-Notch Impact Requirements

Grade G40.21	Minimum Average Energy	Test Temperature Tt for Minimum Service Temperature Ts	
		Ts ≥ -40°C	Ts < -40°C
300WT	20 J	- 30°C	- 40°C
350WT and AT	27 J	- 30°C	- 40°C

E10.6.5 Fabrication Tolerances

(a) Structural Members

(i) Structural members consisting of a single rolled shape shall meet the straightness tolerances of CAN/CSA G40.20 except that columns shall not deviate from straight by more than 1/1000 of the length between points of lateral support.

(ii) A variation of 1 mm from the detailed length adjusted for temperature is permissible in the length of members which have both ends finished for contact bearing.

(iii) Members without finished ends may have a variation from the detailed length of not more than 2 mm for members 10 m long or less, not more than 4 mm for members over 20 m in length. The variation for members between 10 and 20 m in length shall be linearly interpolated.

(b) Abutting Joints

(i) Where compression members are specified to bear against one another, the completed joint shall have at least 75% of the entire contact area in full bearing, defined as an area with no more than 0.5 mm of separation. The separation of the remaining area shall in no case and at no point exceed 1 mm.

(ii) At joints where loads are not transferred in bearing, the nominal dimension of the gap between main members shall not exceed 10 mm unless indicated otherwise on the Drawings.

(c) Bearing Plates

(i) Rolled steel bearing plates 50 mm or less in thickness may be used without planing provided that a satisfactory contact bearing is obtained.

(ii) Rolled steel bearing plates over 50 mm but less than 100 mm in thickness may be straightened by pressing or by planing the entire bearing surface to obtain a satisfactory contact bearing.

(iii) Rolled steel bearing plates over 100 mm in thickness shall be planed on all bearing surfaces except for surfaces which are in contact with concrete or grouted to ensure full bearing.

(d) Bearing Surface Finish

(i) The surface finish of bearing surfaces that are in contact with each other or with concrete, shall meet the following roughness requirements as measured according to ANSI B46.1.

1. Plates in contact as part of bearing assemblies - 25 m (1000 Micro inches)
2. Sliding bearings: steel and copper alloy or - 3 µm (125 Micro inches) steel and stainless steel.

(ii) Surfaces of flanges that are in contact with bearing sole plates shall be flat within 0.5 mm over an area equal to the projected area of the bearing stiffeners and web. Outside this area a 2 mm deviation from flat is acceptable. The bearing surface shall be perpendicular to the web and bearing stiffeners.

(e) Fabricated Components

(i) Tolerances for welded components shall conform to Clause 5.4 of CAN/CSA W59.

(ii) Dimensional tolerances for welded built-up structural members shall conform to those prescribed by Clauses 5.8 and 12.5.3 of CAN/CSA W59.

(iii) Built-up bolted structural members shall satisfy the straightness tolerances for rolled wide flange shapes prescribed by CAN/CSA G40.29.

E10.6.6 Handling, Storage, and Loading

(a) Structural steel, either plain or fabricated, shall be stored upright above ground in a shored position on platforms, skids or other similar supports and shall be kept free from dirt and other foreign matter.

(b) Structural material, either plain or fabricated, shall be protected from corrosion.

(c) Long members shall be so supported as to prevent deflection.

(i) Structural Steel Girder Cover Plates

1. The lifting devices shall be of such a nature as to avoid twisting, racking, or other distortions while handling, storing, moving and erecting the girder components. The devices shown on the Drawings are minimum requirements and the Contractor and the Fabricator shall satisfy themselves as to the adequacy of the devices.
2. The Fabricator shall be responsible for storage of the material from the completion of their fabrication until they are required by the Contractor.
3. During storage and hauling, the material shall be supported in a position so as to avoid twisting, deflection or other distortion that may result in damage.
4. Location of on site storage shall be as identified on the drawings.

E10.6.7 Transportation and Delivery

(a) The structural steel fabricator shall schedule, coordinate and sequence structural steel transportation and delivery in cooperation with the erection of the structural steel by the structural steel erection Contractor.

(b) The Contractor shall perform all work necessary to ensure safe loading, transportation, unloading and storage of structural steel. The Work shall consist of loading the structural steel at the Fabricator's plant, transporting the structural steel to the Site, and unloading and storing the structural steel at the Site, including temporary works for access.

(c) Structural steel shall be loaded for shipping in such a manner that it can be transported and unloaded at its destination in the correct orientation for erection without being excessively stressed, deformed, or otherwise damaged.

(d) Structural steel shall be stockpiled to avoid excessive stress deformation or other damage while stored and consider notes on the drawings.

E10.7 Quality Control

E10.7.1 Non-Destructive Testing Agency

(a) The Contractor shall engage an independent testing organization certified by the Canadian Welding Bureau (CWB) to the requirements of CAN/CSA W178.1 for bridge structures by radiographic, ultrasonic,

magnetic particle, and liquid penetrant test methods to perform all non-destructive testing of the welds.

(b) All visual inspection of welds shall be performed in accordance with CAN/CSA W59 by a welding inspector certified by the CWB to the requirements of CAN/CSA 178.2 (Level II minimum) for bridges and structures.

(c) Non-destructive testing shall be done by a non-destructive testing technician certified to the Canadian General Standards Board (CGSB) in the test method specified and being performed by the Inspector.

(d) Neither the technician nor the independent testing organization shall be changed without the approval of the Contract Administrator.

E10.7.2 Non-Destructive Testing of Welds

(a) Radiographic, ultrasonic, or magnetic particle testing shall be completed by the Contractor using procedures and frequency of testing according to CAN/CSA W59 however, notwithstanding the CAN/CSAW59 requirements, the amount and location of welding to be tested shall be at least:

(i) All welds shall be visually inspected.

(ii) The frequency of radiographic or ultrasonic inspection of groove welds in flanges and webs of built-up girders shall be:

1. Flange splices in tension or stress reversal zones: 100% of all welds.
2. Flange splices in compression zones: 100% of the weld of 1 in 4 splices.
3. Web splices for 1/2 the depth from the tension flange: 100% of theweld length for each weld.
4. Web splices for 1/2 the depth from the compression flange: 100% ofthe weld length of 1 in 4 splices.

(iii) If defects are found during testing, two additional splices shall be testedfor each splice exhibiting defects.

1. Magnetic particle inspection of web-to-flange fillet welds: Submerged-arc welds: 25% of length of eachweld.
2. Semi-automatic welds: 50% of length of eachweld.
3. Manual welds: 100% of length of each weld.

(iv) Magnetic particle inspection of fillet welds in connection plates and stiffenersto which diaphragms or cross bracing are attached:

1. For 1/2 the depth from the tension flange: 100% of weld length ofeach weld.
2. Transverse welds on tension flanges: 100% of weld length of each weld.

(v) Arc strikes outside of the completed welds shall be lightly ground and checked for cracks by Magnetic Particle Inspection.

(vi) Radiographic and ultrasonic testing shall be performed prior to the assembly of the flanges to the webs after splice welds have cooled as per CSA W59.

E10.8 Quality Assurance

E10.8.1 Visual inspection and sampling will be done in the fabricating shop and in the field by the Contract Administrator to confirm the material supplied and the fabrication has been done as specified on the Drawings and in this Specification. The Contractor shall supply material specimens for testing when requested by the Contract Administrator.

E10.8.2 The Contractor shall provide full facilities for the unencumbered inspection of material, workmanship and all parts of the Work at all stages of the Work by the Contract Administrator in the shop, in storage facilities and in the field. The Contract Administrator shall be allowed free access to the Work.

E10.8.3 The Contract Administrator will perform non-destructive testing of the works, destructive testing of samples obtained of materials to be incorporated into the Work and any other additional inspection at their discretion.

E10.8.4 Inspection

(a) The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or acceptance that may have been previously given. The Contract Administrator reserves the right to reject any materials or works which are not in accordance with the requirements of this Specification.

E10.8.5 Access

(a) The Contractor shall allow the Contract Administrator free access to all parts of the Work at all times.

E10.8.6 Inspection Requirements for Fabrication Outside of the Province of Manitoba.

(a) Should all or any part of the structural steel fabrication be undertaken at a facility outside of the Province of Manitoba, expenses incurred by the City and/or the City's representative to carry out audit testing will be deducted as incurred by the City from payments made to the Contractor. Expenses will include, but are not limited to all travel, boarding, lodging and the retention of services from a CWB certified inspection agency of the Department's choice for audit inspections at the fabrication plant of all related works.

E10.9 Measurement and Payment

E10.9.1 The supply and delivery of structural steel shall be measured on a mass basis, as computed from the reviewed shop drawings.

E10.9.2 Supply and delivery of structural steel will be paid for at the Contract Unit Price per kilogram for the "Items of Work" listed here below, which price shall be payment in full for supplying all materials and for completing all operations herein described and all other items incidental to the work included in the Specification, accepted and measured by the Contract Administrator.

(a) Items of Work:

Supply and Delivery of Structural Steel

(i) Cover Plates
(ii) Sole Plates
(iii) Temporary Girder Bracing and Gusset Plates

(b) The measurement excludes the mass of steel spacers, bolts, nuts and washers, which are incidental to the Works.

E11. ERECTION OF STRUCTURAL STEEL

E11.1 Description

E11.1.1 This Specification shall cover all operations relating to the unloading and erecting of structural steel components as specified herein and as shown on the Drawings.

E11.1.2 The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, handling and storage, and all things necessary for and incidental to the satisfactory performance and completion of all Work as herein specified and as indicated on the Drawings.

E11.2 References

E11.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

(a) Section E10. Supply and Delivery of Structural Steel

(b) Section E7. Temporary Protection System

(c) Section E8. Temporary Jacking of Superstructure

E11.3 Scope of Work

E11.3.1 The Work under this Specification shall include:

(a) Unloading and erecting structural steel components including cover plates, bearing sole plates, bearing top plates, temporary girder bracing, nuts and washers, and all incidental structural steel elements as shown and described on the Drawings and in this Specification;

(b) Design, supply, fabrication, installation, maintenance and removal of temporary falsework (where applicable);

(c) The quality control (QC) testing of all materials and the Work.

E11.4 Submittals

E11.4.1 Structural Steel Erection Procedure

(a) A schedule and detailed plan clearly illustrating the method and sequence by which the Contractor proposes to unload and erect the structural steel components. The erection procedure shall include detailed design notes and shop drawings in accordance with E6 Shop Drawings and shall bear the seal of a Professional Engineer registered in the province of Manitoba. The erection procedures shall be sealed, signed and dated by a Professional Engineer, registered or licensed to practice in the Province of Manitoba necessary to describe the following and assume full responsibility that the design is being followed:

(i) Access to work, including earth berms, work bridges, or rock berms. The Professional Engineer shall confirm that the temporary works can fully support all loads during steel erection.

(ii) Type and capacity of proposed equipment.

(iii) Sequence of operation, including position of cranes, trucks, and traffic accommodation.

(iv) Detailed crane position and location, particularly adjacent to substructure elements, such as piers and abutment backwalls, with details of load distribution on wheels and outriggers throughout each lift. If the Contract Administrator, approves the crane positioned on the structure during a portion of the Work, details of crane position on the structure showing wheel loads and axle spacing of equipment moving on structure shall also be submitted.

(v) Loads and their position from crane wheels and outriggers during all positions of lifting when the crane(s) is on or adjacent to the structure.

(vi) Details of temporary falsework, including proposed methods to be used to ensure stability during placement of components. (if applicable).

(vii) Method of providing temporary supports for stability.

(viii) Details of lifting of cover plates, showing vertical forces at lifting points and on the lifting devices.

(ix) Complete details of blocking for bearings where necessary to constrain movement due to horizontal forces and/or gravity effects.

(b) Safety and compliance with Manitoba Workplace Health and Safety Act and Regulations shall be integral to the steel erection procedure.

E11.4.2 Temporary Works

(a) Detailed design notes and shop drawings for any proposed temporary works, shall be sealed signed and dated by a Professional Engineer, registered or licensed to practice in the Province of Manitoba.

E11.5 Materials

E11.5.1 General

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

(b) 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.

E11.6 Equipment

E11.6.1 General

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

(b) All cranes, rigging and equipment shall be in good condition and properly maintained at all times during the period of the work. All cranes, rigging and equipment shall be of sufficient capacity to complete every stage of the erection Works.

(c) The Contract Administrator shall, at his/her discretion, verify capacity and state of equipment provided and any equipment found not meeting the requirements for erection work shall be removed and replaced. Slings and other lifting devices that will be in contact with structural steelwork shall be of a type which shall not damage shop primed or painted surfaces.

E11.7 Construction Methods

E11.7.1 General

(a) The Contractor shall schedule, coordinate and sequence structural steel erection in cooperation with the delivery of the structural steel by the structural steel fabricator.

(b) Any structural steel components that in the opinion of the Contract Administrator have been damaged or otherwise rendered useless by the improper handling by the Contractor shall be replaced by the Contractor at his own expense.

(c) If the structural steel components are stored on the superstructure, the requirements of General – Note 7, on drawing B114-25-02, Sheet 2 of 8 will apply.

E11.8 Erection of Structural Steel

(a) General

(i) Before taking possession and erecting the structural steel, the Contractor shall verify that the dimensions of the cover plates, girder bracing and other components are in accordance with the Shop Drawings. All discrepancies discovered by the Contractor shall be brought immediately to the attention of the Contract Administrator.

(ii) It is essential that the structural steel be erected with utmost attention being given to girder positioning, alignment, and elevation. The Contractor shall adjust position and assembly of components, to replicate the original structure. The Contractor shall minimize the sweep of the girders by jacking, loading of girders, winching, or whatever means are necessary, and shall provide the necessary temporary attachments to hold the girders in position.

The Contract Administrator shall approve of all proposed methods of jacking, loading, winching, etc. prior to the work being undertaken.

(iii) Loose timber blocking will not be permitted for use as temporary works for any aspect of steel erection.

(iv) It is the Contractor's responsibility to ascertain the actual weights of the structural steel.

(b) Erection

(i) The Contract Administrator shall be notified in writing of the starting date at least two (2) weeks prior to the commencement of field operations. Work shall not be carried out until the Contract Administrator is on the Site.

(ii) Components shall be lifted, placed, and maintained in position using appropriate lifting equipment, temporary bracing, guys, or stiffening devices so that the components are at no time overloaded, unstable, or unsafe. Additional permanent material may be provided, if approved by the Contract Administrator, to ensure that the member capacities are not exceeded during erection. The additional material shall be shown in the erection diagram.

(iii) Release of temporary supports or temporary members, etc. must be gradual, and under no circumstances will a sudden release be permissible.

(iv) For temporary fit ups, main girder splices and connections shall be aligned with drift pins and a sufficient number of fitting up bolts shall be installed to maintain the integrity of the connection.

(v) The fitting up bolts may be the high strength bolts used in the installation. Drift pins shall be 1 mm larger in diameter than the required bolts. Excessive drifting that distorts the metal and enlarges the holes is not allowed. Reaming up to 2 mm over the nominal hole diameter is permitted, except for oversize or slotted holes.

(vi) Repairs to erected material will only be permitted after the repair procedure has been approved by the Contract Administrator.

(vii) Filling of misplaced holes by welding is permitted only with the written approval of the Contract Administrator.

(viii) Material intended for use in the finished structure shall not be used for erection or temporary purposes unless such use has been shown on the shop drawings, erection diagram, or authorized by the Contract Administrator.

(ix) Hammering that will damage or distort the members is not permitted.

(x) Surfaces that will be in permanent contact shall be cleaned immediately prior to assembly.

(c) Temporary Stresses

(i) The Contractor shall assume full responsibility for ensuring that all bridge member and component stresses are within permissible limits at all stages of the construction work. The Contractor shall provide all necessary additional steel reinforcement, bracing or other measures required to ensure that the erection procedures do not overstress any temporary or permanent member or component at any stage of the Work.

(d) Temporary Bracing

1. The Contractor shall ensure temporary bracing is in place in

advance of girder jacking operations.

2. Temporary bracing shall be removed upon completion of the cover plate installation and jacking operation.

(ii) After removal of temporary bracing surfaces affected by the installation shall be repaired and coated in accordance with E12 Surface Preparation and Structural Steel Coatings.

E11.8.1 Connections

(a) Holes made in the field shall be drilled or reamed. Shop reamed holes shall not be re- reamed in the field. Holes for cover plates and jacking beams shall only be field drilled following clamping of the cover plates in place.

(b) At the time of erection, all cover and splice plates shall be free of loose mill scale, burrs, and all contamination such as drilling shavings, oil, dirt, and paint.

(c) Surfaces to be in permanent contact shall be cleaned immediately prior to assembly. Existing girder surfaces shall be blast cleaned to remove the existing coating, and then washed to be free of contamination.

(d) Any error in shop fabrication or any deformation resulting from handling or transportation that prevents the proper assembly and fitting of parts, especially splices of main structural members, shall be reported and the proposed method of correction shall be submitted to the Contract Administrator. Corrective measures shall not commence until the submitted proposal is accepted by the Contract Administrator.

E11.8.2 Attachments

(a) The use of tack welds for securing temporary or permanent attachments that are not shown on submitted shop drawings, erection drawings or fabrication drawings shall not be permitted on any portion of girders or any other structural members.

E11.8.3 Field Welding

(a) The company undertaking field-welding shall be certified to Division 1 of CAN/CSA W47.1. E10.10.2. The requirements of the Specifications for Supply and Delivery of Structural Steel, Clause E10.13.2 shall apply.

(b) Girder sole plate to be field welded as shown on the drawings.

E11.8.4 Bolted Construction

(a) The following shall apply.

(i) Bolt heads shall be located on the outside faces of exterior girder webs.

(ii) Bolt heads shall be located as shown on the Contract drawings.

E11.8.5 Removal of Falsework and Site Clean-up

(a) Upon completion of the erection and before final acceptance, the Contractor shall remove all temporary falsework. He shall remove all piling, excavated or surplus materials, rubbish and temporary supports, replace or renew any damaged fences, and restore in an acceptable manner all property damaged during the execution of the Work. Disposed of surplus materials shall be in a manner and at a location satisfactory to the Contract Administrator.

(b) The Contractor shall leave the bridge site, roadway and adjacent property in a neat restored and presentable condition, satisfactory to the Contract Administrator. When requested by the Contract Administrator, the Contractor shall provide written evidence that affected property owners and/or regulatory agencies have been satisfied.

E11.8.6 Protection of Concrete Components

(a) During application of field applied coating system, the substructure shall

be protected during construction against rust-staining by water runoff until the structural steel has been coated.

E11.9 Quality Control and Assurance

(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.

(c) Quality Assurance testing shall be undertaken by the Contract Administrator. Quality Control testing shall be undertaken by the Contractor.

E11.9.1 Quality Assurance

(a) All materials will be subject to physical inspection by the Contract Administrator and will be subject to rejection during the course of the Work and for the length of time as specified in the General Conditions, if, in the opinion of the Contract Administrator, the materials involved do not meet the requirements of the Drawings and this Specification.

(b) All materials shall be subject to testing by the Contract Administrator and will be approved only if the requirements of the Drawings, Standards and this Specification are met. The Contractor shall supply the specimens for testing in accordance with the requests of the Contract Administrator.

(c) The Contractor shall furnish facilities for the inspection of material and workmanship in the mill, shop and field, and the Contract Administrator shall be allowed free access to the necessary parts of the Works. 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.

E11.10 Measurement and Payment

E11.10.1 The erection of structural steel shall be measured on a mass basis, as computed from the reviewed shop drawings. The measurement excludes the mass of steel spacers, bolts, nuts and washers, which are incidental to the Works

E11.10.2 Erection of structural steel will be paid for at the Contract Unit Price per kilogram for the "Items of Work" listed here below, which price shall be payment in full for supplying all materials and for completing all operations herein described and all other items incidental to the work included in the Specification, accepted and measured by the Contract Administrator.

E11.10.3 Items of Work:

Erection of Structural Steel

(i) Cover Plates

(ii) Sole Plates

(iii) Temporary Girder Bracing and Gusset Plates

E12. SURFACE PREPARATION AND STRUCTURAL STEEL COATINGS

E12.1 Description

E12.2 This Specification shall cover all operations relating to the surface preparation and coating of structural steel as specified herein and as shown on the Drawings.

E12.3 The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, handling and storage, and all things necessary for and incidental to the satisfactory performance and completion of all Work as herein specified and as indicated on the Drawings.

E12.4 References

E12.4.1 Perform work in accordance with the requirements of the latest issue of the following specifications and standards:

(a) American Society of Testing Material

i. ASTM D 4285, Standard Test Method for Indicating Oil or Water in Compressed Air;

ii. ASTM B833, Standard Specifications for Zinc Wire for Thermal Spraying (Metallizing);

iii. ASTM D4541, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers;

iv. ASTM D4417, Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel.

(b) Society of Protective Coatings;

i. SSPC-AB 1, Mineral and Slag Abrasives;

ii. SSPC-AB 2, Specification for Cleanliness of Recycled Ferrous Metallic Abrasives;

iii. SSPC-AB 3, Newly Manufactured or Re-Manufactured Steel Abrasives;

iv. SSPC-PA 2, Measurement of Dry Coating Thickness with Magnetic Gages;

v. SSPC-QP 1, Standard Procedure for Evaluating Painting shop Contractors (Field Application to Complex Structures);

vi. SSPC-QP 2, Standard Procedure for Evaluating the Qualifications of Painting Shop Contractors to Remove Hazardous Paint;

vii. SSPC-SP 1, Solvent Cleaning;

viii. SSPC-SP 5/NACE No. 1, White Metal Blast Cleaning;

ix. SSPC-SP 11, Power Tool Cleaning to Bare Metal;

x. SSPC-SP 12/NACE No. 5, Surface Preparation and Cleaning of Metals by Water Jetting Prior to Recoating;

xi. SSPC-SP 16, Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals;

xii. SSPC-PA 17, Procedure for Determining Conformance to Steel Profile/Surface Roughness/Peak Count Requirements;

xiii. SSPC-VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning;

xiv. SSPC-VIS 5, Guide and Reference Photographs for Steel Prepared by Wet Abrasive Blast Cleaning;

xv. SSPC-Guide 15, Field Methods for Retrieval and Analysis of Soluble Salts on Steel and Other Nonporous Surfaces;

xvi. SSPC-CS 23.00/AWS C2.23M/NACE No. 12, Specification for the Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc, and Their Alloys and Composites for the Corrosion Protection of Steel;

xvii. SSPC-PA 18, Specification for Application of Thermal Spray Coatings to Steel Bridges.

(c) American National Standards Institute/American Welding Society;

i. ANSI/AWS C2.25/C2.25M, Specification for Thermal Spray Feedstock-Wire and Rods;

ii. AWS C2.16/C2.16M, Guide for Thermal-Spray Operator Qualification;

iii. S8.2-2017 Specification for Application of Thermal Spray Coating Systems to Steel Bridges.

iv. Metalizing wire and coating manufacturer's application instructions, MSDS and product data sheets.

v. Termarust product data sheets, application guidance, and MSDS sheets for Penetrant TR2200 and Topcoat TR2100.

E12.5 Scope of Work

E12.5.1 The Work under this Specification shall include:

(a) Surface preparation and application of metalizing on new structural steel within the extents shown on the Drawings, or as described herein.

(b) Surface preparation and application of Termarust system (penetrant TR2200 and topcoat TR2100) on the existing and structural steel within the extents shown on the Drawings or described herein;

(c) The quality control testing of all materials.

E12.6 Items of Work

(a) All new structural steel components including cover plates, bolts or any areas on the structural steel of the existing structure which have been affected by the temporary or permanent girder and bearing rehabilitation work including the girder sole plate weld but not including the girder sole plate or top bearing plate and keeper bars shall be coated with Termarust.

(b) The girder sole plates and the top bearing plates and keeper bars shall be metalized.

E12.7 Submittals

E12.7.1 The Contractor shall submit the following to the Contract Administrator, in accordance with the Specification:

(a) At least twenty-one (21) Calendar Days prior to the scheduled commencement of any surface preparation and coating operations, the Contractor shall submit to the Contract Administrator, the proposed schedule, methods and sequence of operations for review.

(b) Drawings sealed by a Professional Engineer registered in the Province of Manitoba shall be submitted detailing the Contractor's proposed scaffolding, platforms, and swing stages to be employed. All scaffolding, platforms, and swing stages shall be designed, constructed, erected and operated in accordance with Workplace Safety and Health Division requirements. No Works shall commence without prior written approval of the Contract Administrator.

(c) The Contract Administrator will provide written notification to the Contractor when submittals are complete and acceptable. No surface preparation work shall begin until that notification is received.

(d) This acceptance shall not be construed to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety concerns. Acceptance does not relieve the Contractor from the responsibility to conduct the work according to the requirements of Federal, Provincial, or Local regulations and this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the Work.

(e) The Contractor remains solely responsible for the adequacy and

completeness of the programs and work practices, and adherence to them.

E12.8 Materials

E12.8.1 General

(a) The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification. All materials supplied under this Specification shall be subject to inspection and acceptance by the Contract Administrator. There shall be no charge to the City for any material taken by the Contract Administrator for testing purposes.

(b) Materials called for under these Specifications and on the Drawings shall, unless otherwise specified, satisfy the testing procedures and be in strict accordance with the requirements set out in the latest edition of the standards identified.

E12.8.2 Metalizing Wire

(a) All thermal spray feedstock (metallizing wire) shall be the products of a single manufacturer, meet the requirements below, and meet the thermal spray equipment manufacturer's specifications.

(i) The metallizing wire shall consist of ninety-nine and nine tenths percent (99.9%) zinc complying with ASTM B-833 and ANSI/AWS C2.25/C2.25M.

(ii) The Contractor shall provide a certificate of chemical composition of the proposed metallizing wire from the metallizing wire manufacturer.

E12.8.3 Coating Material Supply Requirements

(a) All metallizing material shall be delivered in the original unopened spools with manufacturer's labels intact. Any material that has been damaged or otherwise deteriorated shall not be used. The Contractor shall provide, if and when requested by the Contract Administrator, a listing, updated weekly, of the weight and number of spools and the type of metallizing material (as identified by a mill test report and corresponding heat number for each spool) received from the metallizing manufacturer on this project.

(b) All Termarust materials shall be delivered in unopened containers with the manufacturer's labels intact. Any mater that has been damaged or otherwise deteriorated shall not be used. The Termarust colour shall match the colour of the metalizing.

(c) All material shall be stored under cover in a secured place as approved by the Contract Administrator and shall be kept within storage temperature limitations recommended by the manufacturer.

E12.8.4 Abrasive for Blast Cleaning

(a) The blast-cleaning abrasive shall be free of corrosion-producing contaminants. Acceptable angular shaped abrasives include, but are not limited to, aluminum oxide, steel grit, and crushed slag. Silica sand shall not be used. Steel shot and other abrasives producing a rounded surface profile are not acceptable, even if mixed with angular grit abrasives. The blast-cleaning abrasive and grit size employed shall be capable of achieving an average profile peak-to-valley height of at least 3.5 mils and not exceeding 4.5 mils.

(b) Abrasive suppliers shall provide written certification that expendable abrasives and recyclable steel grit abrasives meet the requirements of SSPC-AB 1 and AB 3, respectively. Abrasive suppliers shall certify that abrasives are not oil contaminated and shall have a water extract pH value within the range of 6 to 8.

(c) Blast cleaning in zones of Termarust application is only required on faying surfaces to bolted cover plate and jacking beam connections. All other Termarust zones shall be prepared by means outlined within the product information sheets.

E12.8.5 Incidental and Miscellaneous Materials

(a) Incidental and miscellaneous materials utilized in undertaking the surface preparation and coating Works shall be supplied strictly in accordance with the manufacturer's guidelines, as approved in advance by the Contract Administrator, and in accordance with these Specifications.

(b) This will include solvent mixtures associated with solvent cleaning operations, and any other incidental materials used in conjunction with the Works of this Specification.

(c) The use of all such materials shall be reviewed with the Contract Administrator to ensure conformance with the Specification, prior to the use of same in the Works. The Contract Administrator's decision in these matters shall be final.

E12.8.6 Water

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

E12.9 Equipment

E12.9.1 General

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

E12.9.2 Surface Preparation and Coating Equipment

(a) All equipment shall be of a type approved by the Contract Administrator and capable of preparing the existing structural steelwork surfaces in accordance with these Specifications.

(b) The coating application equipment shall be designed such that the coating will be applied uniformly to all surfaces in the locations required as shown on the Drawings and approved by the Contract Administrator and shall be kept in good working order.

(c) The Contractor shall provide surface preparation, metallizing, and painting equipment as needed to perform the work as specified herein.

(d) Metallizing application equipment shall be portable electric arc thermal spray units that are up, adjusted and operated in accordance with the manufacturer’s written instructions.

(e) All cleaning and painting equipment shall include gages capable of accurately measuring fluid and air pressures and shall have valves capable of regulating the flow of air, water or paint as recommended by the equipment manufacturer. The equipment shall be maintained in proper working order.

(f) Diesel or gasoline powered equipment shall be positioned or vented in a manner to prevent deposition of combustion contaminants on any part of the structure.

(g) Hand tools, power tools, pressure washing, water jetting, abrasive blast cleaning equipment, brushes, rollers, and spray equipment shall be of suitable size and capacity to perform the work required by this specification. Appropriate filters, traps and dryers shall be provided for the compressed air used for abrasive blast cleaning and conventional spray application.

E12.10 Construction Methods

E12.10.1 General

(a) The surface preparation and metallizing shall be according to the SSPC Specification

(b) for the Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc and their Alloys and Composites for the Corrosion Protection of Steel, SSPC-CS 23.00/AWS C2.23M/NACE No. 12 except as modified herein. In the event of a conflict, the requirements of this specification shall prevail.

(c) The Surface preparation and application of Termarust system shall be according to the product technical data sheets.

(d) The Contractor shall notify the Contract Administrator twenty-four (24) hours in advance of beginning surface preparation operations

E12.10.2 Access

(a) Access methods for workers and equipment to access all areas of the structure must be submitted by the Contractor and approved by the Contract Administrator at least ten (10) working days prior to the proposed commencement of construction.

E12.10.3 Test Areas (Sections)

(a) Prior to proceeding with production work on the project, if requested by the Contract Administrator, the Contractor shall prepare test sections of at least 10 square feet (0.93 sq. m). More than one test section may be needed to represent the various design configurations of the structure.

(i) For metalizing: The test section(s) shall be blast cleaned, metallized and painted (if specified) in accordance with the requirements specified herein using the same equipment, materials and procedures that will be used for the production.

(ii) For Termarust: The test section(s) shall be pressure washed and painted in accordance with the requirements specified herein using the same equipment, materials and procedures that will be used for the production.

(b) During the performance of the test section(s), in the presence of the Contract Administrator, the Contractor shall perform all quality control tests and inspections required by this specification including complete documentation. In addition, the Contractor shall allow sufficient time for the Contract Administrator to perform any or all quality assurance tests and inspections desired.

(c) Production work shall not proceed until the Contract Administrator agrees that the pressure washing, blast cleaning, metallizing, Termarust application, and painting work, along with the quality control testing, inspection, and documentation are acceptable.

(d) No additional compensation will be paid for the preparation of the test section(s).

E12.10.4 Protective Coverings and Damage

(a) Prior to undertaking any Works, the Contractor shall take all necessary precautions to prevent blast-cleaning overspray and overspray/splatter/drift of the coating, all in accordance with E42 Environmental Containment Collection and Disposal. All splatter, overspray, and spills shall be promptly removed by the Contractor at his own expense to the satisfaction of the Contract Administrator.

(b) The Contractor must provide adequate protection against sandblast or coating damage to the substructure, sewer forcemain, bearings, vehicles, watercrafts, private property, and the public in the vicinity of the bridge. The Contractor will be held solely liable for any damages or claims resulting from the blast cleaning and coating operations.

E12.10.5 Ambient Conditions

(a) Surfaces prepared for metallizing or painting shall be free of moisture and other contaminants. The Contractor shall control operations to ensure that dust, dirt, or moisture do not come in contact with surfaces on which work will take place.

(b) Under no circumstances shall the metallizing or Termarust be applied until the surface preparation has been inspected and approved by the Contract Administrator immediately prior to commencement of metallizing application operations.

(c) Metallizing or Termarust application shall not be carried out:

(i) When the temperature of the air or steel is below five degrees Celsius (5°C);

(ii) Unless the temperature of the steel is at least five degrees Celsius (5°C) above the dewpoint;

(iii) If the temperature is expected to drop below zero degrees Celsius (0°C) during the drying period;

(iv) If the relative humidity exceeds the coating manufacturer's written recommendations.

(d) The manufacturer's published literature shall be followed for specific temperature, dew point, and humidity restrictions during the application of each paint coat.

(e) Metallizing or paint shall not be applied in rain, wind, snow, fog or mist. Ambient conditions shall be maintained during the drying period specified by the manufacturer.

E12.10.6 Compressed Air Cleanliness

(a) Prior to using compressed air for abrasive blast cleaning, blowing down surfaces, and metallizing or painting application, the Contractor shall verify that the compressed air is free of moisture and oil contamination according to the requirements of ASTM D 4285.

(b) The tests shall be conducted at least one (1) time per shift for each compressor system in operation. If air contamination is evident, the Contractor shall change filters, clean traps, add moisture separators or filters, or make other adjustments as necessary to achieve clean, dry air.

(c) The Contractor shall also examine the work performed since the last acceptable test for evidence of defects or contamination caused by the contaminated compressed air. Contaminated work shall be repaired at no additional cost to the City.

E12.10.7 Solvent Cleaning

(a) All traces of oil, grease, and other detrimental contaminants on the steel surfaces to be metallized shall be removed by solvent cleaning in accordance with SSPC-SP 1. The brand name of proposed cleaning solvent(s) and/or proprietary chemical cleaners including manufacturer's product data sheet and MSDS shall be submitted for the Contract Administrator's acceptance prior to use.

(b) Under no circumstances shall blast cleaning be performed in areas containing surface contaminants or in areas where the Contract Administrator has not accepted the solvent cleaning. Rejected surfaces shall be re-cleaned to the specified requirements at no additional cost to the City.

E12.10.8 Abrasives

(a) Abrasive blast cleaning shall be performed using either expendable abrasives or recyclable steel grit abrasives. Expendable abrasives shall be used one (1) time and discarded. The abrasive shall be angular in shape.

(b) On a daily basis, the Contractor shall verify that recycled abrasives are free of oil and contamination by performing a vial test in accordance with SSPC-AB 2.

(c) All surfaces that are found to have been prepared using abrasives not meeting the SSPC-AB 1, AB 2, or AB 3 requirements, as applicable, are oil contaminated, or have a pH outside the specified range, shall be solvent cleaned or low-pressure water cleaned, and re-blast cleaned at no cost to the City.

E12.10.9 Surface Preparation

(a) Before any blast cleaning operations or any coating applications

commence, the following surface cleaning operations shall be undertaken on all structural steel members designated to receive a coating system.

(i) All organic materials such as bird droppings, and any other non-structural obstructions or pollutants attached to the steel are to be removed by hand cleaning operations.

(ii) All oil and grease shall be removed manually as per E9.5.1;

(iii) The entire area shall be washed clean by using high pressure water washing as per SSPC-SP12WJ4-NV2.

(b) The following method of surface preparation shall be used:

(i) Flame Cut Steel: Prior to blast cleaning, all flame cut edges shall be ground to remove hardened steel and any sharp or irregular shapes.

(ii) Near-White Metal Blast Cleaning: All steel surfaces to be metallized shall be near white metal blast cleaned in accordance with SSPC-SP 10 using dry abrasive blast cleaning methods.

(iii) Base Metal Irregularities: If hackles, burrs, or slivers in the base metal are visible on the steel surface after cleaning, the Contractor shall remove them by grinding followed by re-blast cleaning.

E12.10.10 Surface Profile

(a) Blast cleaning abrasives shall be of the size and grade that will produce a uniform angular surface profile depth of 3.5 to 4.5 mils (89 to 114 microns).

(b) If metalizing wire manufacturer's profile requirements are more restrictive, the Contractor shall advise the Contract Administrator and comply with those requirements. For recycled abrasives, an appropriate operating mix shall be maintained in order to control the profile within these limits.

(c) The average surface profile shall be determined each workday with a minimum frequency of one (1) location per every 200 sq ft (18.6 sq m) per piece of equipment. All surfaces, including flame cut edges, shall be tested in accordance with SSPC-PA 17.

(d) Surface profile replica tape or electronic profilometer shall be used. The tape shall be retained and included with the daily QC report. Single measurements less than 3.5 mils (89 microns) are unacceptable. In that event, additional testing shall be done to determine the limits of the deficient area and, if it is not isolated, work will be suspended.

(e) The Contractor shall submit a plan for making the necessary adjustments to ensure that the specified surface profile is achieved on all surfaces. Work shall not resume until the Contract Administrator provides written acceptance.

(f) Any areas shielded or hidden from the effects of sandblasting shall be cleaned manually or by other means to the satisfaction of the Contract Administrator.

(g) The blasting shall be performed so as not to damage or contaminate any previously coated areas.

(h) Where the coating has been damaged or rejected, remove loose or rejected coating to meet surface preparation as specified in this specification. Cleaning shall be performed approximately 20 mm beyond the damaged areas in all directions or until soundly adhered coating is obtained.

E12.10.11 Clean-up Operations

(a) Following all blast cleaning operations and prior to the Contract Administrator's inspection, all surfaces involved shall be blown off with compressed air or cleaned by vacuum for the purpose of removing any and all traces of blast products from the surface, and for the removal of abrasive from all pockets and corners.

(b) Following surface preparation clean-up operations, the Contractor shall immediately notify the Contract Administrator so that an inspection can be made prior to the application of coating.

(c) The coating shall be applied as soon as possible after the surface preparation clean- up operation as approved by the Contract Administrator.

E12.10.12 Surface Condition Prior to Metallizing

(a) The Contractor shall provide the Contract Administrator with a minimum of four (4) hours' notice prior to coating, to allow for testing and inspection of prepared surfaces.

(b) Prepared surfaces shall meet the requirements of SSPC-SP 10 immediately prior to metallizing, and shall be metallized within six (6) hours of blast cleaning. If rust appears or bare steel has been exposed for more than six (6) hours, the affected area shall be re-blasted at no additional cost to the City.

(c) All dust and surface preparation residue on steelsurfaces shall be removed prior to metallizing.

(d) The quality of surface preparation and cleaning of surface dust and debris shallbe accepted by the Contract Administrator prior to metallizing. No coating shall be applied to any prepared surface until written acceptance of complete surface preparation of an area has been given by the Contract Administrator.

(e) The Contract Administrator has the right to reject any work that was performed without adequate provision for quality assurance observations to accept the degree of cleaning. Rejected metallizing work shall be removed and replaced at no additional cost to the City.

E12.10.13 Daily Metallizing Operator - Equipment Qualification - Bend Tests

(a) Unless directed otherwise by the Contract Administrator, each day that metallizing will be applied, the Contractor shall perform bend testing prior to beginning production work.

(b) For each metallizing applicator, five (5) carbon steel coupons 50 mm x 200 mm x 1.3 mm thick shall be blast cleaned using the same equipment and abrasive used for the production work. Each applicator shall apply the metallizing to five (5) coupons in accordance with the requirements of this Specification to a dry film thickness of 8.0 to 12.0 mils (200 to 300 µm).

(c) 180 degree bend testing shall be performed on all five (5) coupons using a 13 mm mandrel in accordance with the requirements and acceptance criteria ofSSPC-CS.

(d) 23/AWS C2.23M/NACE 12. Minor cracks that cannot be lifted from the substrate with knife blade are acceptable. If lifting occurs on any coupon, the surface preparation and/or metallizing process shall be modified until acceptable results are achieved before proceeding with production work.

E12.10.14 Application of Metallizing

(a) Application shall be done in overlapping passes in a crosshatch pattern (i.e., a second set of overlapping passes shall be applied at right angles to the first set of overlapping passes) to ensure uniform coverage.

(b) The gun shall be held at such a distance from the work surfaces that the metal is still molten on impact. The metallizing shall be applied as a continuous film of uniform thickness, firmly adherent, and free from thin spots, misses, lumps or blisters, and have a fine sprayed texture. Thin spots and misses shall be re-metallized.

(c) If touch up metallizing or the application of additional metallizing to previously applied metallizing does not occur within twenty-four (24) hours, the surface of the metallizing shall be brush off blast cleaned according to SSPC-SP7 to remove oxidation and surface contaminates prior to the application of additional metallizing.

(d) The final appearance of the metallizing when left un-top coated shall be uniform without excessive blotchiness or contrast in color. If the surface does not have a uniform appearance, remove and replace the metallizing at no cost to the City.

(e) If the configuration of the surface being metallized does not allow for a proper gun-to- work piece standoff distance, the Contractor shall notify the Contract Administrator.

(f) The existing metal shall not be heated to a temperature exceeding three hundred and fifty degrees Celsius (350°C).

E12.10.15 Metallizing Thickness

(a) The thickness of the metallizing shall be 8.0 to 12.0 mils (200-300 microns). Thickness shall be measured as specified by SSPC-PA 2 (use a Type 2 Electronic Gauge only).

E12.10.16 Metallizing Adhesion

(a) Adhesion testing of metallizing applied each day shall be determined with a self- adjusting adhesion tester in accordance with ASTM D 4541.

(b) Unless otherwise directed by the Contract Administrator, a minimum of one (1) test shall be conducted for every 500 square feet (46 square metres) of metallized surface.

(c) The tests shall be conducted prior to application of any coating. If any of the tests exhibit less than 700 psi (4.83 MPa) for 85/15 or less than 500 psi (3.45 MPa) for zinc, additional tests shall be conducted to determine the extent of the deficient material.

(d) All deficient metallizing shall be removed by blast cleaning and re-applied at no additional cost to the City.

(e) At the discretion of the Contract Administrator, a representative blast cleaned test panel (or steel companion panel approximately 12 inch x 12 inch x 1/4 inch thick) can be metallized at the same time each 500 square feet (46 square metres) of surface area, or portion thereof, is metallized. Adhesion testing can be performed on the companion panel rather than on the structure

(f) If the adhesion tests on the panels are acceptable, the metallizing on the structure is considered acceptable and testing on the structure is not required. If adhesion testing of the panels fails, testing shall be conducted on the structure.

(g) If adhesion testing on the structure is acceptable, the metallizing on the structure is considered to be acceptable.

(h) If tests on the structure are unacceptable, complete removal of the failing metallizing and re-metallizing in accordance with this Specification shall be performed at no additional cost to the City.

E12.10.17 Surface Condition Prior to Termarust Application

(a) The Contractor shall provide the Contract Administrator with a minimum of four (4) hours' notice prior to coating, to allow for testing and inspection of prepared surfaces.

(b) Prepared surfaces shall meet the requirements of the Termarust Technical data sheets for application.

(c) The quality of surface preparation and cleaning of surface dust and debris shall be accepted by the Contract Administrator prior to application of Termarust. No coating shall be applied to any prepared surface until written acceptance of complete surface preparation of an area has been given by the Contract Administrator.

E12.10.18 Application of Termarust

(a) Thoroughly wet out all joints, crevices, and areas to be protected with Termarust TR2200 penetrant/sealer by pressure spray prior to application.

(b) Application shall be completed with air less spray, conventional spray gun, pressure rust proofing, hudson chemical sprayer, small pump sprayer, brush if spray not available.

(c) When applying the Termarust TR2100 Topcoat remove excess Termarust TR2200 penetrant / sealer before applying topcoat.

E12.11 Quality Control and Assurance

E12.11.1 Quality Control

(a) The Contractor performing the shop work shall perform first line, in process QC inspections. The Contractor shall implement the accepted QC Program to ensure that the work complies with these specifications.

(b) The designated Quality Control inspector shall be onsite full time during any operations that affect the quality of the system (e.g., surface preparation, metallizing application, paint application, and final inspection at project completion).

(c) The Contractor shall use the Contractor Daily (QC) Metallizing & Painting Report form to record the results of quality control tests and inspections. The completed reports shall be given to the Contract Administrator before work resumes the following day.

(d) QC inspections shall include, but are not limited to the following:

(i) Ambient conditions;

(ii) Surface preparation (solvent cleaning, abrasive blast cleanliness, surface profile depth, etc.);

(iii) Metallizing application (specified materials used, bend test, continuity and coverage, adhesion, dry film thickness);

(iv) Verification that the MISTIC test ID number for the paint system has been issued when painting is specified;

(v) Paint Application (when specified)(specified materials used, continuity and coverage, dry film thickness, freedom from overspray, dry spray, pinholes, skips, misses, etc.).

(e) The personnel managing the QC Program shall possess a minimum classification as a NACE CIP Level 2, or shall provide evidence of successful inspection of three (3) projects of similar or greater complexity and scope completed in the last two (2) years. References shall include the name, address, and telephone number of a contact person employed by the facility owner.

(f) The personnel performing the QC tests shall be trained in all tests, inspections, and instrument use required for the inspection of surface preparation, metallizing and paint application. Documentation of training shall be provided. The QC personnel shall be solely dedicated to quality

control activities and shall not perform any production work. QC personnel shall take the lead in all inspections, but applicators shall perform wet film thickness measurements during application of the coatings, with QC personnel conducting random spot checks. The Contractor shall not replace the QC personnel assigned to the project without advance notice to the Contract Administrator, and acceptance of the replacement(s), by the Contract Administrator.

(g) The Contractor performing the work shall supply all necessary equipment to perform the QC tests and inspections as specified. Equipment shall include the following at a minimum.

(i) Psychrometer or comparable equipment for measurement of dew point and relative humidity, including weather bureau tables or psychrometric charts;

(ii) Surface temperature thermometer;

(iii) SSPC Visual Standard VIS 1;

(iv) Surface profile replica tape and spring micrometer or electronic micrometer designed for use with replica tape; or electronic profilometer designed for measuring blast profile;

(v) Blotter paper for compressed air cleanliness checks;

(vi) Type 2 Electronic Dry Film Thickness Gage;

(vii) Calibration standards for dry film thickness gage;

(viii) Bend test coupons and bend test mandrel;

(ix) Adhesion testing instrument;

(x) Companion panels for adhesion testing (if that option is selected);

(xi) All applicable ASTM, ANSI, AWS, and SSPC Standards used for the work (reference list included).

(h) The instruments shall be verified for accuracy and adjusted by the Contractor's personnel in accordance with the equipment manufacturer's recommendations and the Contractor’s QC Program. All inspection equipment shall be made available to the Contract Administrator for quality assurance observations as needed.

E12.11.2 Quality Assurance

(a) The Contract Administrator will conduct quality assurance observations of any or all phases of the work. The presence or activity of the Contract Administrator observations in no way relieves the Contractor of the responsibility to perform all necessary daily QC inspections of their own and to comply with all requirements of this Specification.

(b) The Contract Administrator has the right to reject any work that was performed without adequate provision for quality assurance observations.

E12.12 Measurement and Payment

(a) Surface preparation and metalizing or applying Termarust on structural steel, as defined in this Specification, will not be measured. This item of work will be paid for at the Contract Lump Sum Price for “Surface Preparation and Structural Steel Coating”, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in the Specification and accepted by the Contract Administrator.

E13. BRIDGE BEARING REFURBISHMENT

E13.1 Description

(a) The Work covered under this item shall include all operations relating to bridge bearing modifications in accordance with this Specification and as shown on Drawing No. B114-25-04.

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

E13.2 Materials

E13.2.1 Structural Steel

(a) Structural steel shall be in accordance with E10 Supply and Delivery of Structural Steel. The bearing top plate and keeper bars including seal welds are to be metallized not including stainless steel sheets.

(b) Stainless Steel sheets shall conform to ASTM A167 Type 304 with bright annealed no.8 finish one side only.

E13.2.2 Galvanizing Touch-up and Field-Applied Galvanizing

(a) If required as directed by the Contract Administrator, field-applied galvanizing, to touch-up damaged hot-dip galvanizing, metallizing, or field welds, shall be done with self-fluxing, low temperature, zinc-based alloy rods in accordance with ASTM A780-80 for “Repair of Damaged Hot-Dip Galvanized Coatings.” Approved products are Galvalloy as manufactured by Metalloy Products Company, P.O. Box No. 3093, Terminal Annex, Los Angeles, California, and Welco Gal-Viz Galvanizing Alloy, as manufactured by Thermocote Welco, Highway 161 York Road, Kings Mountain, North Carolina. Locally, both products are available from Welder Supplies Limited, 25 McPhillips Street, Winnipeg.

E13.2.3 Stainless Steel Sheets

(a) The stainless steel sheets shall be 2 mm thick on both the bottom surface of the top plate and inside surface of the keeper bars.

E13.3 Construction Methods

E13.3.1 Purpose of Refurbishments

(a) The intent of the refurbishment is to replace the existing top bearing plates with replicated components including the attached stainless steel plates as well as the restraint bars with attached stainless steel plates (restraint bars and attached stainless steel plates on the MK 11 bearing at Pier 2 only).

E13.3.2 Submission

(a) The Contractor shall measure the existing bearing components to be replaced and produce shop drawings for review at least five (5) days prior to starting any structure jacking or bearing refurbishment.

E13.3.3 Field-Applied Touch-up Galvanizing

(a) If and as directed by the Contract Administrator, any areas of damaged galvanizing or metallizing on miscellaneous steel items shall receive field-applied touch-up galvanizing.

(b) Surfaces to receive touch-up 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.

E13.3.4 Maintenance of Expansion/Contraction Capability

(a) The Contractor's temporary supports must be capable of allowing the normal expansion/contraction movements of the bridge superstructure to take place while they are being used.

E13.3.5 Bearing Removals

(a) Before any jacking takes place, the height of the supported girder is to be measured with respect to the concrete bearing surface at various locations and recorded. The intent of this is to produce the same girder elevation when it is placed on the temporary support.

(b) The bearing removals are to be done with a minimum of jacking. The structures may be raised somewhat for the procedure, but no more than 15mm from their current locations unless otherwise approved by the Contract Administrator.

(c) Care should be taken not to overload adjacent bearings.

(d) When no work on cover plate replacement is occurring, the Contractor administrator may direct the Contract to provide temporary girder support under the girder while the permanent bearings are out. The Contractor shall provide a temporary bearing design for the Contract Administrator's review. An acceptable temporary bearing would consist of steel plate between elastomeric sheets. The temporary bearings may be fabricated/assembled by the Contractor or may be purchased from commercial bearing manufacturers. Steel and elastomeric sheets should have properties equal to or better than that provided by commercial bridge bearing manufacturers of such bearings.

(e) An acceptable size of such a temporary bearing would be 750 W x 750 L x 125 H. The additional thickness of bearing required to fill the full depth could be created by additional steel shims. Other temporary bearing types will be considered.

(f) When the girder load is removed from the jacks and placed on the temporary bearing, the girder elevation shall be within 3 mm of the original girder elevation as determined before the original bearing was removed.

E13.3.6 Bearing Refurbishment

(a) Bearing refurbishment shall consist of work as follows:

(i) Confirm bearing top plate and keeper bar dimensions.

(ii) Fabricate replacement top plate to replicate existing including manner in which keeper bars are attached. This will require machining a dado into the top plate to seat keeper bars and attaching them each with 6 stainless steel bolts similar in size as the existing into a drilled and tapped hole in the bearing top plate.

(iii) Attach stainless steel plates. Stainless steel plates to be continuously welded on all sides.

(iv) Metalize all exposed steel bearing surfaces not including stainless steel.

(v) After installation of girder cover and sole plates, remove and replace existing bearing top plates.

(vi) Set position of bearings as directed by Contract Administrator based on ambient temperature.

(vii) Monitor and adjust bearing position as necessary while superstructure is being lowered.

(b) Zinc Metallize Steel Bearings

(i) All exposed steel surfaces of the bearings including seal welds, except for the stainless steel surfaces, are to be metallized in accordance with Section E12 of this Specification.

(c) Stainless Steel Welding

(i) Continuous weld around perimeter of stainless steel plates to be by TIG welding process.

E13.4 Measurement and Payment

E13.4.1 The refurbishment of bridge bearings will be measured on a unit basis and paid for at the Contract Unit Price for the Items of Work listed herein below. The units to be paid for will be the number of bearings refurbished in accordance with this Specification and accepted by the Contract Administrator.

Items of Work:

(a) Bridge Bearing Refurbishment:
(i) MK 10 Bearing
(ii) MK 11 Bearing