



**THE CITY OF WINNIPEG**

# **TENDER**

**TENDER NO. 1365-2019**

**REPLACEMENT OF GWWD RAIL CROSSING PROTECTION AT TRANS-CANADA  
HIGHWAY 1**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 REPLACEMENT OF GWWD RAIL CROSSING PROTECTION AT TRANS-CANADA HIGHWAY 1

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, February 27, 2020.

B2.2 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

### **B3. SITE INVESTIGATION**

B3.1 Further to C3.1, the Bidder may view the Site without making an appointment.

### **B4. ENQUIRIES**

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

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

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

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

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

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

### **B5. CONFIDENTIALITY**

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

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

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

## **B6. ADDENDA**

- B6.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Tender, or clarifying the meaning or intent of any provision therein.
- B6.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B6.3 Addenda will be available on the MERX website at [www.merx.com](http://www.merx.com).
- B6.4 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the MERX website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B6.5 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid/Proposal. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.
- B6.6 Notwithstanding B4, enquiries related to an Addendum may be directed to the Contract Administrator indicated in D4.

## **B7. SUBSTITUTES**

- B7.1 The Work is based on the Plant, Materials and methods specified in the Tender.
- B7.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B7.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B7.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
  - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
  - (c) identify any anticipated cost or time savings that may be associated with the substitute;
  - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
  - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B7.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an "approved equal" or as an "approved alternative", or may refuse to grant approval of the substitute.

- B7.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.
- B7.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B18.
- B7.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

## **B8. BID COMPONENTS**

- B8.1 The Bid shall consist of the following components:
- (a) Form A: Bid/Proposal;
  - (b) Form B: Prices;
  - (c) Form G1: Bid Bond and Agreement to Bond.
- B8.2 Further to B8.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B7.
- B8.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely.
- B8.4 The Bid shall be submitted electronically through MERX at [www.merx.com](http://www.merx.com).
- B8.4.1 Bids will **only** be accepted electronically through MERX.
- B8.5 Bidders are advised that inclusion of terms and conditions inconsistent with the Tender document, including the General Conditions, will be evaluated in accordance with B18.1(a).

## **B9. BID**

- B9.1 The Bidder shall complete Form A: Bid/Proposal, making all required entries.
- B9.2 Paragraph 2 of Form A: Bid/Proposal shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
  - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
  - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
  - (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B9.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B9.2.

- B9.3 In Paragraph 3 of Form A: Bid/Proposal, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B9.4 Paragraph 13 of Form A: Bid/Proposal shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
  - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
  - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers;
  - (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B9.4.1 The name and official capacity of all individuals signing Form A: Bid/Proposal should be entered below such signatures.
- B9.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

## **B10. PRICES**

- B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B10.1.1 Prices stated on Form B: Prices shall not include any costs which may be incurred by the Contractor with respect to any applicable funding agreement obligations as outlined in D24. Any such costs shall be determined in accordance with D24.
- 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 B18.5 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 its participation in the Tender process or the Work; or
  - (f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the Tender process) of strategic and/or material relevance to the Tender process or to the Work that is not available to other bidders and that could or would be seen to give that Bidder an unfair competitive advantage.
- B12.3** In connection with its Bid, each entity identified in B12.2 shall:
- (a) avoid any perceived, potential or actual Conflict of Interest in relation to the procurement process and the Work;
  - (b) upon discovering any perceived, potential or actual Conflict of Interest at any time during the Tender process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Contract Administrator; and
  - (c) provide the City with the proposed means to avoid or mitigate, to the greatest extent practicable, any perceived, potential or actual Conflict of Interest and shall submit any additional information to the City that the City considers necessary to properly assess the perceived, potential or actual Conflict of Interest.
- B12.4** Without limiting B12.3, the City may, in its sole discretion, waive any and all perceived, potential or actual Conflicts of Interest. The City's waiver may be based upon such terms and conditions as the City, in its sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Bidder to put into place such policies, procedures, measures and other safeguards as may be required by and be acceptable to the City, in its sole discretion, to avoid or mitigate the impact of such Conflict of Interest.
- B12.5** Without limiting B12.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in its sole discretion:
- (a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of its employees proposed for the Work;
  - (b) require the removal or replacement of any employees proposed for the Work that has a perceived, actual or potential Conflict of Interest that the City, in its sole discretion, determines cannot be avoided or mitigated;
  - (c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B12.4 to avoid or mitigate a Conflict of Interest; and



- (d) disqualify a Bidder if the Bidder, or one of its employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.

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

### **B13. QUALIFICATION**

B13.1 The Bidder shall:

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

B13.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website 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) upon request of the Contract Administrator, provide the Security Clearances in accordance with PART F - SECURITY CLEARANCE.

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

- (a) Written confirmation of a safety and health certification meeting SAFE Work Manitoba's SAFE Work Certified Standard (e.g., COR™ and SECOR™) in the form of:
  - (i) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
  - (ii) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
- (b) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>).

B13.5 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B13.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

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

B14.1 A sample Bid Bond and Agreement to Bond are available on The City of Winnipeg, Corporate Finance, Materials Management Division website at <https://www.winnipeg.ca/MatMgt/templates/files/eBidsecurity.pdf>.

B14.2 The Bidder shall provide digital bid security in the form of a 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 the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond).

B14.3 Bid security shall be submitted in an electronic or digital format meeting the following criteria:

- (a) 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; all digital seals; with the surety company, or an approved verification service provider of the surety company.
- (b) 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.
- (c) 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.
- (d) The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding B14.3(a).

B14.4 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).

B14.5 Bonds passing the verification process will be treated as original and authentic.

B14.5.1 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.

B14.6 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.

B14.7 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Tender.

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

B15.1 Bids will not be opened publicly.

B15.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated and pending review and verification of conformance with requirements) will be available on the MERX website at [www.merx.com](http://www.merx.com).

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

B15.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).

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

## **B16. IRREVOCABLE BID**

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

B16.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly formed and the contract securities have been furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid/Proposal.

## **B17. WITHDRAWAL OF BIDS**

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

## **B18. EVALUATION OF BIDS**

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

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

B18.2 Further to B18.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B18.3 Further to B18.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is qualified.

B18.4 Further to B18.1(c), where the Total Bid Price exceeds the estimate stated in D2.5, the City may determine that no award will be made in accordance with B19.2.1(a).

B18.5 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.

B18.5.1 Bidders are advised that the calculation indicated in B18.5 will prevail over the Total Bid Price entered in MERX.

## **B19. AWARD OF CONTRACT**

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

- B19.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be qualified, and the Bids are determined to be responsive.
- B19.2.1 Without limiting the generality of B19.2, the City will have no obligation to award a Contract where:
- (a) the prices exceed the available City funds for the Work;
  - (b) the prices are materially in excess of the prices received for similar work in the past;
  - (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
  - (d) only one Bid is received; or
  - (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.
- B19.3 If funding for the Work is provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada, Bidders are advised that the terms of D24 shall immediately take effect upon confirmation of such funding, regardless of when funding is confirmed.
- B19.4 Where an award of Contract is made by the City, the award shall be made to the qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B18.
- B19.4.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

## PART C - GENERAL CONDITIONS

### C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 2020-01-31) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at [http://www.winnipeg.ca/matmgt/gen\\_cond.stm](http://www.winnipeg.ca/matmgt/gen_cond.stm)
- C0.2 A reference in the Tender to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Construction*.

## PART D - SUPPLEMENTAL CONDITIONS

### GENERAL

#### D1. GENERAL CONDITIONS

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

#### D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of the crossing protection signals at the GWWD Railway and Trans-Canada Highway 1 crossing.

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

- (a) Demolition of existing track protection;
- (b) Construction of an access road to bungalow location from westbound Trans-Canada Highway 1;
- (c) Abandonment of the existing power source and connection to new power source;
- (d) Construction of a new bungalow;
- (e) Installation of a solid-state controller for both crossings;
- (f) Installation of new crossing protection signals;
- (g) Remove and replace insulated joints;
- (h) Carry out crossing upgrades in line with GWWD Grade Crossing Assessment, included in Appendix A; and
- (i) Testing and commissioning of the new crossing protection.

D2.3 Notwithstanding D2.2(h), items noted in D15 shall be completed by others and only coordination is required of the Contractor.

D2.4 The Contractor will notify the train operations authority to ensure that the crossing and any special information is added into the General Operating Instructions when the warning systems are placed in-service.

D2.5 The pre-bid estimate for this Contract is \$950,000.00.

#### D3. DEFINITIONS

D3.1 When used in this Tender:

- (a) "**GWWD**" means Greater Winnipeg Water District;
- (b) "**MI**" means Manitoba Infrastructure;
- (c) "**AREMA**" means American Railway Engineering & Maintenance-Of-Way Association;
- (d) "**CEC**" means Canadian Electrical Code;
- (e) "**GCS**" means Grade Crossings Standards July 2014 (Transport Canada); and
- (f) "**GCR**" means Grade Crossings Regulations, Canada Gazette Part II Dec 17, 2014 (Transport Canada).

#### D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is WSP Canada Group Limited, represented by:  
Scott Minty, M.Sc., P.Eng.  
Project Manager, Transportation Engineering, Manitoba

Telephone No. 204 943-3178  
Email Address scott.minty@wsp.com

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

**D5. CONTRACTOR'S SUPERVISOR**

- D5.1 At the pre-construction meeting, the Contractor shall identify his/her designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.
- D5.2 At least two (2) business days prior to the commencement of any Work on the site, the Contractor shall provide the Contract Administrator with a phone number where the supervisor identified in D4.1 or an alternate can be contacted twenty-four (24) hours a day to respond to an emergency.

**D6. NOTICES**

- D6.1 Except as provided for in C22.4, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid/Proposal.
- D6.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D6.3 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator identified in D4.
- D6.3 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following facsimile number:

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

**D7. FURNISHING OF DOCUMENTS**

- D7.1 Upon award of the Contract, the Contractor will be provided with three (3) complete sets of the Tender. If the Contractor requires additional sets of the Tender, they will be supplied to him/her at cost.

**SUBMISSIONS**

**D8. AUTHORITY TO CARRY ON BUSINESS**

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

## **D9. SAFE WORK PLAN**

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

## **D10. INSURANCE**

- D10.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least 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 \$5,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.
  - (c) an all risks Installation Floater carrying adequate limits to cover all machinery, equipment, supplies and/or materials intended to enter into and form part of any installation.
- D10.2 Deductibles shall be borne by the Contractor.
- D10.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4.1 for the return of the executed Contract Documents, as applicable.
- D10.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

## **D11. CONTRACT SECURITY**

- D11.1 The Contractor shall provide and maintain the performance bond and the labour and material payment bond until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; and
  - (b) a labour and material payment bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H2: Labour and Material Payment Bond), in an amount equal to fifty percent (50%) of the Contract Price.
- D11.2 The Contractor shall provide the City Solicitor with the required performance and labour and material payment bonds within seven (7) Calendar Days of notification of the award of the Contract by way of an award letter and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract Documents, if applicable.
- D11.3 The Contractor shall, as soon as practicable after entering into a contract with a Subcontractor:



- (a) give the Subcontractor written notice of the existence of the labour and material payment bond in D11.1(b); and
- (b) post a notice of the bond and/or a copy of that bond in a conspicuous location at the Site of the Work.

## **D12. SUBCONTRACTOR LIST**

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

## **D13. DETAILED WORK SCHEDULE**

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

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

- (a) a Gantt chart for the Work.

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

## **SCHEDULE OF WORK**

### **D14. COMMENCEMENT**

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

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

- (a) the Contract Administrator has confirmed receipt and approval of:
  - (i) evidence of authority to carry on business specified in D8;
  - (ii) evidence of the workers compensation coverage specified in C6.15;
  - (iii) the twenty-four (24) hour emergency response phone number specified in D5.2
  - (iv) the Safe Work Plan specified in D9;
  - (v) evidence of the insurance specified in D10;
  - (vi) the contract security specified in D11;
  - (vii) the Subcontractor list specified in D12;
  - (viii) the detailed work schedule specified in D13; and
  - (ix) the security clearance requirements identified in PART F - Security Clearance.
- (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

D14.3 The Contractor shall not commence the Work on the Site before September 8, 2020.

D14.4 The City intends to award this Contract by April 9, 2020.

D14.4.1 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.

## **D15. WORK BY OTHERS**

- D15.1 Work by others on or near the Site will include but not necessarily be limited to:
- (a) Manitoba Infrastructure – MI will be completing roadway upgrades and new pavement markings at the crossing surface and approaches. The Contractor is expected to coordinate and cooperate with MI as required.
  - (b) City of Winnipeg – The City will install emergency notification signage.
  - (c) City of Winnipeg – The City will be completing upgrades to the railway at the crossing in 2020. The Contractor is expected to coordinate and cooperate with the City, as required.
- D15.2 The Contractor shall coordinate all utility watches as required.

## **D16. SUBSTANTIAL PERFORMANCE**

- D16.1 The Contractor shall achieve Substantial Performance by October 9, 2020.
- D16.2 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.
- D16.3 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.

## **D17. TOTAL PERFORMANCE**

- D17.1 The Contractor shall achieve Total Performance by October 16, 2020.
- D17.2 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.
- D17.3 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.

## **D18. LIQUIDATED DAMAGES**

- D18.1 If the Contractor fails to achieve, Critical Stages, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Calendar Day for each and every Calendar Day following the days fixed herein for same during which such failure continues:
- (a) Substantial Performance – Three Thousand dollars (\$3,000.00);
  - (b) Total Performance – Two Thousand dollars (\$2,000.00).
- D18.2 The amounts specified for liquidated damages in D18.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve, Critical Stages, Substantial Performance or Total Performance by the days fixed herein for same.
- D18.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

## **CONTROL OF WORK**

### **D19. JOB MEETINGS**

- D19.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.
- D19.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

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

- D20.1 Further to C6.26, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

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

- D21.1 Further to B13.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B13.4.

## **MEASUREMENT AND PAYMENT**

### **D22. PAYMENT**

- D22.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

## **WARRANTY**

### **D23. WARRANTY**

- D23.1 Warranty is as stated in C13.

## **THIRD PARTY AGREEMENTS**

### **D24. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS**

- D24.1 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.
- D24.2 Further to D24.1, in the event that the obligations in D24 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.
- D24.3 For the purposes of D24:

- (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.

#### D24.4 Modified Insurance Requirements

- D24.4.1 If not already required under the insurance requirements identified in D10, the Contractor will be required to provide wrap-up liability insurance in an amount of no less than two million dollars (\$2,000,000) inclusive per occurrence. Such policy will be written in the joint names of the City, Contractor, Consultants and all sub-contractors and sub-consultants and include twelve (12) months completed operations. The Government of Manitoba and its Ministers, officers, employees, and agents shall be added as additional insureds.
- D24.4.2 If not already required under the insurance requirements identified in D10, the Contractor will be required to provide builders’ risk insurance (including boiler and machinery insurance, as applicable) providing all risks coverage at full replacement cost, or such lower level of insurance that the City may identify on a case-by-case basis, such as an installation floater.
- D24.4.3 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.
- D24.4.4 Further to D10.3, insurers shall provide satisfactory Certificates of Insurance to the Government of Manitoba prior to commencement of Work as written evidence of the insurance required. The Certificates of Insurance must provide for a minimum of thirty (30) days’ prior written notice to the Government of Manitoba in case of insurance cancellation.
- D24.4.5 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.

#### D24.5 Indemnification By Contractor

- D24.5.1 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.

#### D24.6 Records Retention and Audits

- D24.6.1 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.
- D24.6.2 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 D24.6.1 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.

D24.7 Other Obligations

- D24.7.1 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.
- D24.7.2 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.
- D24.7.3 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.
- D24.7.4 The Contractor shall properly account for the Work provided under this Contract and payment received in this respect, prepared in accordance with generally accepted accounting principles in effect in Canada, including those principles and standards approved or recommended from time-to-time by the Chartered Professional Accountants of Canada or the Public Sector Accounting Board, as applicable, applied on a consistent basis.

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

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

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

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

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

TENDER NO. 1365-2019

REPLACEMENT OF GWWD RAIL CROSSING PROTECTION AT TRANS-CANADA HIGHWAY 1

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**FORM H2: LABOUR AND MATERIAL PAYMENT BOND**  
(See D11)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

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

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

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

TENDER NO. 1365-2019

REPLACEMENT OF GWWD RAIL CROSSING PROTECTION AT TRANS-CANADA HIGHWAY 1

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

NOW THEREFORE the condition of the above obligation is such that if the Principal shall promptly make payment to all claimants as hereinafter defined, for all labour, service and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void, otherwise it shall remain in full force and effect subject, however, to the following conditions:

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



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

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

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

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

SIGNED AND SEALED  
in the presence of:

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

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

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

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

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

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



## PART E - SPECIFICATIONS

### GENERAL

#### E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

- E1.1 These Specifications shall apply to the Work.
- E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Spec/Default.stm>
- E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.2.3 Further to C2.4(d), Specifications included in the Tender shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.3 Manitoba Infrastructure Specifications for Traffic Control – Specification No. 200 (I).
- E1.4 City of Winnipeg Water & Waste Department Equipment Identification Standard.
- E1.5 Transport Canada's Grade Crossing Regulations (2014).
- E1.6 Transport Canada's Grade Crossing Standards (2014).
- E1.7 Transport Canada's RTD 10 Road/Railway Grade Crossings Technical Standards and Inspection, Testing and Maintenance Requirements (2002).
- E1.8 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.
- E1.9 The following are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
G-100	GWWD CROSSING WARNING SYSTEM - TITLE PAGE
G-101	GWWD CROSSING WARNING SYSTEM - INDEX FOR GENERAL DRAWINGS
R-200-EB	GWWD CROSSING WARNING SYSTEM - UPGRADED GWWD RAILWAY CROSSING MILE 67.28
R-201-WB	GWWD CROSSING WARNING SYSTEM - UPGRADED GWWD RAILWAY CROSSING MILE 67.18
R-202-ACCESS	GWWD CROSSING WARNING SYSTEM - UPGRADED GWWD RAILWAY CROSSING MILE 67.18
S-100	GWWD CROSSING WARNING SYSTEM - TYPICAL FOUNDATION
GWWD067.23PA001	GWWD CROSSING WARNING SYSTEM - INDEX FOR ELECTRICAL DRAWINGS
GWWD067.23PA002	GWWD CROSSING WARNING SYSTEM - Mi.67.18 WESTBOUND SINGLE LINE TRACK PLAN
GWWD067.23PA003	GWWD CROSSING WARNING SYSTEM - Mi.67.28 EASTBOUND SINGLE LINE TRACK PLAN
GWWD067.23PA004	GWWD CROSSING WARNING SYSTEM - TRACK LAYOUT
GWWD067.23PA005	GWWD CROSSING WARNING SYSTEM - TRACKS CIRCUITS

GWWD067.23PA006	GWWD CROSSING WARNING SYSTEM - Mi.67.18 WESTBOUND SSCCIV CONTROLLER CIRCUITS
GWWD067.23PA007	GWWD CROSSING WARNING SYSTEM - Mi.67.18 WESTBOUND SSCCIV CONTROLLER PROGRAM DATA
GWWD067.23PA008	GWWD CROSSING WARNING SYSTEM - Mi.67.18 WESTBOUND SEARII CIRCUITS
GWWD067.23PA009	GWWD CROSSING WARNING SYSTEM - Mi.67.18 WESTBOUND SEARII PROGRAM DATA
GWWD067.23PA010	GWWD CROSSING WARNING SYSTEM - Mi.67.18 WESTBOUND FLASHING LIGHT AND BELL CIRCUITS
GWWD067.23PA011	GWWD CROSSING WARNING SYSTEM - Mi.67.28 EASTBOUND SSCCIV CONTROLLER CIRCUITS
GWWD067.23PA012	GWWD CROSSING WARNING SYSTEM - Mi.67.28 EASTBOUND SSCCIV CONTROLLER PROGRAM DATA
GWWD067.23PA013	GWWD CROSSING WARNING SYSTEM - Mi.67.28 EASTBOUND SEARII CIRCUITS
GWWD067.23PA014	GWWD CROSSING WARNING SYSTEM - Mi.67.28 EASTBOUND SEARII PROGRAM DATA
GWWD067.23PA015	GWWD CROSSING WARNING SYSTEM - Mi.67.28 EASTBOUND FLASHING LIGHT AND BELL CIRCUITS
GWWD067.23PA016	GWWD CROSSING WARNING SYSTEM - DC DISTRIBUTION
GWWD067.23PA017	GWWD CROSSING WARNING SYSTEM - AC DISTRIBUTION
GWWD067.23PA018	GWWD CROSSING WARNING SYSTEM - BUNGALOW LAYOUT TOP VIEW
GWWD067.23PA019	GWWD CROSSING WARNING SYSTEM - BUNGALOW LAYOUT SIDE D & L.I.G.P.
GWWD067.23PA020	GWWD CROSSING WARNING SYSTEM - BUNGALOW LAYOUT SIDES A, B & C

## **E2. TRAFFIC CONTROL**

E2.1 Notwithstanding CW 1130:

E2.1.1 The Contractor shall be responsible for placing, maintaining and removing the appropriate temporary traffic control devices as specified by the Manitoba Infrastructure Specifications for Traffic Control – Specification No. 200 (I), the Manitoba Infrastructure Work Zone Traffic Manual and the Associated Work Zone Policies. Which are all included in Appendix C of these Tender documents.

E2.1.2 The required level of traffic control shall be **Level III**.

E2.1.3 **TMP-915-27 and TMP-915-29** in the Manitoba Infrastructure Work Zone Traffic Manual shall apply.

E2.2 Measurement and Payment.

E2.2.1 The lump sum price for providing the required level of traffic control will be compensation in full for performing all work and providing all items necessary or incidental thereto (including the provision of flag persons as required by this Specification).

E2.2.2 Forty percent of the lump sum price for “Traffic Control” will be paid on the first progress estimate after site work commences, the remainder will be paid when 100% of the contract work has been performed.

E2.3 Further to E2.1:

E2.3.1 A minimum of one lane of traffic [eastbound] and one lane of traffic [westbound] must be maintained at all times during their respective construction times. When no work is being performed on site, non-essential lane closures will not be permitted.

- E2.3.2 Flag persons may be necessary for safety and to maintain the flow of traffic during certain work operations.
- E2.3.3 Where directed by the Contract Administrator, the Contractor shall construct and maintain temporary asphalt ramps to alleviate vertical pavement obstructions to the satisfaction of the Contract Administrator.
- E2.3.4 Ambulance/emergency vehicle access must be maintained at all times.
- E2.3.5 No additional measurement for payment will be made for performing all operations herein described and all other items incidental to "Traffic Control".

### **E3. HYDRO EXCAVATION**

#### **E3.1 Description**

- E3.1.1 This specification shall cover the works and locations as directed by the Contract Administrator for the removal of earthen material immediately adjacent to underground utilities infrastructure by means of high pressure water spray, and the recovery of excavated material by vacuum type means or equivalent method as approved by the Contract Administrator.

#### **E3.2 Equipment**

- E3.2.1 Hydro-Excavation equipment shall be capable of maintaining a minimum working pressure of 10,000 psi, at a rate of flow of 10 to 12 gallons per minute. The unit should be adjustable, so as to provide adequate pressure to remove earthen material identified by the Contract Administrator.
- E3.2.2 Spray head shall be equipped with a rotating type nozzle in order to provide a wider path of cut.

#### **E3.3 Construction Methods**

##### **E3.3.1 Hydro-Removal of Earthen Material**

- (a) Earthen material adjacent to utility entity shall be sprayed with high pressure water so as to remove all such material identified by the Contract Administrator.

##### **E3.3.2 Recovery of Excavated Material**

- (a) The recovery of excavated material shall be done using a vacuum type method, or other type method as approved by the Contract Administrator.
- (b) The recovery of material shall follow immediately behind the excavation, to avoid excavated areas from filling with excavated material.
- (c) The use of mechanical sweepers will not be allowed.
- (d) Dispose of material in accordance with Section 3.4 of CW 1130-R2.

#### **E3.4 Measurement and Payment**

- E3.4.1 Hydro-Excavation of earthen material and its recovery and disposal will be considered incidental to the Work. No measurement and payment will be made within this section.

### **E4. SOFT EXCAVATION TO EXPOSE UNDERGROUND UTILITIES**

#### **E4.1 Description**

- E4.1.1 This specification covers the soft excavation to expose underground utilities to determine the depth of the underground utility and whether it will interfere with the installation of proposed Works on site.
- E4.1.2 These underground utilities include, but are not limited to, Manitoba Hydro cables, MTS cables, CPR, existing sewers, and existing watermains.

## E4.2 Materials

### E4.2.1 Backfill Material

- (a) Backfill material for backfill of shafts after hydro-excavation has been completed shall consist of sand as per City of Winnipeg Standard Construction Specification CW 2030.

## E4.3 Construction Methods

E4.3.1 Prior to commencement of any construction works adjacent to underground utilities, the Contractor shall use soft digging or hand excavation to expose the underground utilities.

E4.3.2 Once the elevation of the top of the pipe or duct has been determined the resulting excavation shall be backfilled with bedding sand to the elevation of the existing ground.

## E4.4 Measurement and Payment

E4.4.1 Soft excavation to expose underground utilities will be considered incidental to the Work. No measurement and payment will be made within this section.

## E5. RAIL CROSSING WARNING SYSTEM SPECIFICATIONS

### E5.1 General

Warning systems shall be installed crossing the Greater Winnipeg Water District (GWWD) Railway at the following location for both Eastbound and Westbound portions of the roadway:

GWWD Railway Mi.67.23 – PTH 1 Highway Crossing Warning Systems Mi.67.18 & Mi.67.28.

The area is non-signaled territory.

The warning systems include the supply and installation of a single 8' X 8' bungalow (which shall operate both portions of the roadway) complete with heater and fan, two (2) SSCC IV Crossing Controllers, standard flashing LED lights, two (2) Siemens SEAR recorders and rail bonding. The island track circuits and approach track circuits shall be style C. The power source shall be 120/240 volt, 60Amp. The operating speeds, approach distances, cantilevers, masts, flashing lights, bells, and crossing signs shall be shown in the Contract Drawings.

**The Contractor will notify the train operations authority to ensure that the crossing and any special information is added into the General Operating Instructions when the warning systems are placed in-service.**

### E5.2 Scope of Work

To supply, install and commission a safe working reliable crossing warning system, as outlined in this specification and the Contract Drawings. Provision of test plans, and test records shall be included. The work of this Contract includes, but is not limited to, the following:

All material shown on the plans and identified in the specifications; all material required to provide a complete working system whether identified in this specification or not; and all material and equipment necessary for installation and commissioning - is included in the work.

The scope of work includes the demolition plan as outlined in this specification.

#### E5.2.1 Demolition Plan

The existing railway crossing infrastructure shall be removed including the existing control box, power feed, four hydro poles, and cantilevers. The Contractor shall assume ownership of the materials and shall dispose of them at an approved site. The Contractor shall make every effort to minimize any damage to the existing equipment that may occur during the removal, storage, loading and unloading of the removed equipment.

Concrete foundations for the existing railway cantilevers shall be excavated and removed to a depth equal to the adjacent ditch elevation. The Contractor shall assume ownership of the resulting debris and shall dispose of the materials at an approved landfill site. The removed hydro poles can remain on site at an approved location.

To minimize the normal traffic and train operations, the Contractor shall coordinate with traffic operation, train operation and utilities during the removal work.

#### E5.2.2 Installation

The work includes the complete installation of all equipment and components to provide a complete working system.

#### E5.2.3 Testing and Commissioning

The system shall be completely tested and commissioned into service. All tests to ensure that individual components and subsystems are to specifications and function as intended and that all wiring and installation is correct and meets specifications, shall be duly performed. All operational tests shall be performed, and the system shall be functionally tested for train operation.

#### E5.2.4 Documentation, As-Built Plans, Manuals

All the following items shall be provided to the City.

- (a) Documented test procedures and results, and system settings.
- (b) A clearly marked up plan set showing the actual as-installed installation.
- (c) Maintenance (I&M) manuals for all key components.

#### E5.2.5 Coordination, Permits

E5.2.6 The Contractor shall coordinate his work with the other jurisdictions and disciplines, and is responsible for obtaining any required permits or licenses to perform the work. The Contractor shall coordinate the new installation and demolition of existing infrastructure with other organizations as required. Coordination includes roadways, traffic operations, train operation, utilities and other elements involved in the normal course of the work. The Contractor will be responsible for locating utilities in the area of the installation.

#### E5.3 Installation Requirements

The road crossing warning system shall be installed and operate in accordance with the standards, guidelines and recommendations of Section 3 of the American Railway Engineering and Maintenance of Way Association Communication & Signal Manual. The system shall also comply with the Grade Crossings Regulations and Grade Crossings Standards published by Transport Canada.

#### E5.4 Protection of Aqueduct

- (a) The Shoal Lake Aqueduct is a critical component of the City of Winnipeg's Water Supply System. Work in proximity to the Aqueduct shall be undertaken with an abundance of caution.
- (b) The Aqueduct is constructed of non-reinforced concrete and in some areas contains numerous cracks. The Aqueduct, therefore, shall be considered as a fragile structure. All Work procedures conducted by the Contractor in proximity to the Aqueduct shall be well planned and executed to ensure that the Aqueduct is not subjected to construction related loads, including excessive vibrations and concentrated or asymmetrical lateral loads.
- (c) All area within fifteen (15) metres of the centreline of the Aqueduct shall be considered a Restricted Access Zone.
  - (i) Under no circumstances shall vehicles or equipment be permitted to enter the Restricted Access Zone.
  - (ii) The storage of construction materials, equipment, excavation material, fuel, or any other materials shall not be permitted within the Restricted Access Zone.

- (d) The Contractor shall erect temporary fencing along the edge of the Restricted Access Zone that is within the limits of the construction area, as directed by the Contract Administrator.

#### E5.5 Existing Ballast and Paved Road Conditions

Rigid PVC Schedule 40 heavy wall conduits (3 inch) to be placed under the road and conduits (3 inch) to be placed under the track for the use of installing cable through these areas.

#### E5.6 Housing and Layout

The Contract Plans utilize an 8' x 8' aluminum bungalow complete with heater and fan using the corresponding equipment layout. The bungalow shall be a CN style Safetran 8' x 8' bungalow or equivalent. The layout; load center wiring; power off lights; ground plane details; and any other items relevant to the bungalow build shall be in accordance with the contract drawings. Air conditioning shall not be included.

#### E5.7 Definitions

- (a) N/A

#### E5.8 Material, Equipment, and Hardware

This section specifies the properties and technical requirements of the equipment to be furnished as part of this Contract. The purpose of this section is to clearly identify the intended equipment to be used on this project. All equipment supplied in this Contract must fully comply with these Specifications.

Whether stated in this specification or not, individual equipment is to include all hardware and miscellaneous material necessary for its installation and use.

All equipment:

- (a) must be entirely suitable for the application;
- (b) shall be new and free of defects;
- (c) shall have been proven in service;
- (d) must meet or exceed all applicable AREMA recommendations; and
- (e) must comply with the Specifications herein.

The equipment manufacturer for each type of equipment furnished under this Contract shall be known and recognized in the industry to be a regular manufacturer of the type being furnished. For equipment understood in the industry as being 'signal' equipment, the manufacturer shall be recognized in the industry as a manufacturer of signal system products.

All items used in this project are not necessarily listed in this section. Items illustrated in the contract drawings and/or listed in the Material References is understood to be a standard railway signal item, and all railway specifications, standards, and current installation and test practices apply.

There may be some items in this section, which are not used in this application as defined in the plans but are included in case some options are exercised or changes made.

Equipment and equipment groups in this section are listed in alphabetical order.

##### E5.8.1 AC Distribution Equipment

All equipment - enclosures, circuit breakers, switches, fittings, etc., utilized in the distribution of 120/240 VAC power within the crossing system shall comply with the applicable local codes and CEC.



#### E5.8.2 Arrestors and Surge Protection

Lightning arrestors shall be of the type specifically designed for railway signal use, and, as a minimum, shall conform to the requirements of AREMA.

Arrestors furnished shall, in each application, be entirely suitable in rating, breakdown voltage, and other factors for the circuit on which applied, and the function of application. That is, the characteristics shall be compatible with the circuit on which it is being applied; the primary function - line to line or line to ground protection, and the level of protection required.

Application of arrestors shall not impose any circuit impedance restriction.

Arrestors shall provide the primary protection required to bring the levels to within the range of the secondary protection.

Surge protection units shall provide complete transient voltage surge and current surge protection to the equipment being protected. The units shall reduce and maintain the electrical levels to within the range of the protection internal to the device being protected. The surge protection units shall effectively protect to applied levels that are above the lower end of the levels achieved by the primary protection. The surge protection unit shall trigger/shunt at the low voltage required for the protection of solid-state equipment. The surge protection unit shall not affect the device or circuitry being protected.

#### E5.8.3 Batteries

Type of battery shall be low maintenance, valve regulated, nickel cadmium.

Battery shall meet or exceed the recommendations of AREMA Signal Manual, Part 9.1.16 - Criteria for Valve Regulated Battery: Nickel Cadmium.

Battery shall utilize gas recombination technology. Gas recombination shall take place at a minimum eighty percent (80%) efficiency, measured under normal float conditions when the electrolyte level is at the maximum line.

Battery capacity shall be 340 AH (operating bank) and 340 AH (non-operating bank).

The ampere-hour rating shall be based on the eight (8) hour discharge rate to 1.10 volts per cell at a temperature of 25°C.

Nominal life of battery under normal float conditions shall be twenty (20) years. but in no case less than fifteen (15) years.

Battery banks shall have (11) eleven cells (operating bank) and nine (9) cells (non-operating bank).

Battery shall be furnished fully charged and ready for service.

Battery shall include all material for installation and connection.

#### E5.8.4 Bell

Provide a signal bell for mounting on the top of mast where shown on the Contract Drawings. Bell shall be furnished in accordance with AREMA Signal Manual Part 3.2.61. Loud tone; electronic, omni-directional bell (360°)

Nominal operating voltage should be 10 volts dc. The bell should operate properly between 8 and 14 volts dc.

Bell should operate between 100 and 325 impulses per minute.

#### E5.8.5 Chargers, Battery

Battery charger shall meet or exceed the recommendations of AREMA Signal Manual, Part 9.2.1 for constant voltage battery charger.

Charger shall be suitable for use with valve regulated nickel cadmium batteries.

Charger shall be suitable for the number of cells in the battery, and accommodate a range of cells, e.g. nine (9) or twelve (12) NiCad cells. The desired float voltage shall be easily settable. Charger shall be of sufficient rating and capacity for the circuit load, battery charging, and the recharging of a discharged battery.

The battery charger shall operate from a nominal 115 VAC or 240 VAC. 60 Hz. It shall maintain its DC output voltage within tolerance over an input voltage variation of at least plus ten percent to minus fifteen percent (+10% to -15%).

The charger shall incorporate temperature compensation of the output voltage, and the degree of compensation shall be appropriate for the type and number of cells.

Charger shall include protection and limiting necessary to ensure an efficient, reliable, and safe operation.

Charger shall be equipped with Form C normally closed dry contact designed to open upon detected loss of charging current to the battery.

#### E5.8.6 Flashing Light Assemblies

12' LED Flashing Light Assemblies shall be installed.

Flashing light units shall be supplied with hoods and backgrounds, which have a non-reflective black finish.

Light roundels shall be twelve inches (12') in diameter with a lens spread designed to meet the requirements of field conditions for proper coverage.

Pairs of light units of grade crossing warning systems shall flash alternately at the rate of not less than 45 nor more than 65 flashes per minute.

#### E5.8.7 Railway Crossing Sign

The Railway Crossing Sign shall comply with GCS 8.

The Railway Crossing Sign must be clearly visible to all approaching drivers.

#### E5.8.8 Fuses

Fuses shall be of suitable capacities to protect the various pieces of signal apparatus from the effects of short circuits or overloads. Fuses required shall be furnished for the equipment and systems in accordance with the Specifications and the Contract Drawings. Including those damaged or burned out in the course of installation and testing. In general, circuit fuses shall be non-renewable, and shall be of the fiber-case, time lag, fusion type. The fuses shall be the correct size and rating and shall protect the electrical equipment and circuits from short-term and long-term overloads.

Fuse clips shall be so constructed that they shall retain their resilience under all installation and service conditions to assure a positive contact between the clips and the fuse. Approved types of fuses shall be connected into track, and power circuits. These components shall be of such design and capacity that they will protect the equipment and provide positive and safe operation.

#### E5.8.9 Grounding Bungalow

Four-point grounding system consisting of a ground rod approx. 2 feet away from the bungalow sides at each corner of the bungalow, the rods to be bonded together with #6 bare wire. At least two corner rods shall be connected via stranded insulated green #6 wire to ground connections within the bungalow. Driven ground rods shall be copper-clad steel, with the non-rusting copper exterior molecularly welded to the high strength steel core, or shall be an approved equivalent. The rod shall be at least eight (8) feet in length and at least 5/8-inch in diameter. Rods shall have a chamfered top to prevent mushrooming, shall have a pointed end to penetrate all types of soil, and shall be threaded on both ends to allow for connection of additional rods in series. Wire for connection between ground grid and signal housing ground bus, or wayside equipment shall be #6 AWG bare, solid. All

miscellaneous materials and tools required to ensure grounding is completed in compliance with these Specifications are included in the work.

#### E5.8.10 Housing

Grade crossing warning system instrument housing shall be located no closer than 9 m (30 ft) from the traveled way of the road, and no closer than 8 m (26 ft.) from the nearest rail, unless restricted by the width of the railway right of way, rock cuts, high fills, or water, in which case, they shall be placed as far from the nearest rail as conditions allow. Check the assessments for any special requirements

Housing of crossing control equipment shall weatherproof all interior equipment.

#### E5.8.11 Insulated Joints and Track Lead Bonds

Insulated joints shall be AREMA compliant and of the bolted type. Insulated joints shall be new, designed for the specified weight and section of rail, and suitable for intended use. Fibre insulated joints are not allowed. Rail Bonding shall be AREMA and rail signal industry accepted type. The Contractor shall inspect and properly update bonding around the non-insulated joint bars for approach track circuits defined in the contract drawings.

Track leads shall be S8 bond strand spliced to #6 track leads. Riser arrangement must be of a type accepted in the industry.

#### E5.8.12 Lock and Keys

Provide padlocks and matching key(s) to lock all wayside equipment (doors, housings, junction boxes, etc.). Signal padlocks shall be of the CN style.

#### E5.8.13 Relays, Vital, Dc, Plug-In

Relays shall be the plug-in type meeting the requirements of AREMA Signal Manual Part 6.2.1. Relays of each type shall be uniform in design and contact assembly, and shall be a product of a single manufacturer.

Provide relays complete with relay unit, plug base, crimp type two wire terminals, base and relay tags, and all mounting hardware and accessories necessary to complete the installation.

Facilities shall be provided on the front of the relay or plug base for testing current.

Facilities shall be included for mounting an approved typed or printed relay nametag for each relay, either on the relay cover or on the relay cabinet front plate, as applicable. The nametag shall be easily replaceable but shall not come off during normal service.

Contact arrangements shall be identical for similar types of relays except special function relays.

#### E5.8.14 Resistors

Approved types of resistors shall be connected into track, line and power circuits. These components shall be of such design and capacity that they will protect the equipment and provide positive and safe operation.

All resistors, other than those required for electronic circuits, shall be suitable for railway signaling circuits, and shall meet all applicable AREMA Specifications as described in AREMA Signal Manual Part 14.2.15.

#### E5.8.15 Signs

"Railway Crossing Ahead" signs in accordance with GCS 8.2.1 shall be installed on each road approach as necessary.

Emergency Notification signs in accordance with GCS 8.5 shall be installed at each crossing as necessary.

#### E5.8.16 Tags

Tags shall be permanent, water proof, pre-typed, wrap around. plastic coated cable, or non-metallic, slip-on type to identify cables, wires and equipment.

Both ends of each cable, each conductor in each cable. and all terminated conductors and equipment shall be permanently identified with a tag. All tags shall be installed so that they may be read with a minimum of disturbance of the tags or other equipment.

#### E5.8.17 Terminals

Contractor shall supply terminals for termination of wires and cables as required in various sections of these Specifications. Terminals shall be provided in all instrument enclosures and signal appliance junction boxes.

Terminal blocks shall meet the requirements of AREMA Signal Manual, Parts 14.1.5, and 14.1.8.

Furnish terminal blocks complete with all screws, nuts, washers, and test links necessary for installation and wire termination. Nuts and washers shall meet the requirements of AREMA Signal Manual, Part 14.1.11.

Test Links shall be of the straight, insulated, special-nut type to allow opening of circuits for testing without disconnecting terminated wires. Test links shall meet the requirements of AREMA Signal Manual, Part 14.1.15. Provide lock nuts to lock test link nuts in-place.

Terminal binding posts shall be suitable for railway signaling circuits. and shall meet the requirements of AREMA Signal Manual, Part 14.1 .10.

All AREMA type terminal posts located on entrance racks, which terminate a circuit with 24V or greater shall be fitted with a protective insulator. This insulator shall be installed after all wire terminations and connections have been made. The type of insulator shall be individual for each terminal post and the material shall be fire-resistant.

#### E5.8.18 Track Circuits

The island and approaches will be Type C (a track circuit which uses an alternating current source, a dc detection relay at the feed end, and a diode between the rails at the far end. Also referred to as Style C or AC/DC).

#### E5.8.19 Wire and Cable

All wire and cable utilized in the vital circuitry shall be of type and quality as understood by the railway industry to be 'railway signal wire and cable' and currently used by the major railways in Canada. The cable manufacturer shall have a minimum of ten (10) years of documented experience in supplying cable to the railway industry. Cables shall conform with either AREMA or CP-100 SCM-S-0930-01 specifications. All wire and cable shall meet the requirements of the applicable sections of the AREMA Signal Manual or CP-100 specification. All wire and cable shall have characteristics - voltage rating, conductor material, insulation type, life expectancy rating, etc. suitable for this application. All wire and cable shall be new. Track wires shall be 2 single conductors #6 twisted. AC/DC track circuits must not be placed in the same conduit. Wire sizes shall be as identified on the plans, and in any case not less than equipment manufacturers recommendation for the application.

#### E5.8.20 Foundations – Instrument Housing, Masts and Cantilevers

Foundations for the instrument housing, masts and cantilevers shall be furnished and installed by the Contractor. Mast and cantilever foundations shall be on a ASTM standard A36/A36M-96 (Specification for Structural Steel) structural plate steel hot dipped galvanized conforming to ASTM standard A123/A123M-97a (Specification for Zinc (Hot Dipped Galvanized) Coating on Iron and Steel Products), minimum galvanized thickness .0034 in, In accordance with AREMA Part 14.4.17. Bolts, nuts and washers shall be galvanized. Nuts, threads, and washers shall be in accordance with Part 15.3.1.

(Recommended Developmental Criteria for Metallic Coating of Metals). The bungalow foundations shall be of the drop down pier type per Safetran bungalow.

#### E5.8.21 Masts and Cantilevers

Provide grade crossing masts and cantilevers as shown on the Contract Drawings. Mast assemblies and cantilever assemblies shall conform to the provisions of Transport Canada, the AREMA Signal Manual, and these Specifications.

Each mast shall be equipped with front and back flashing lights at end of arm and standard cross buck sign complete with flashing lights. Where cantilevers are provided the front and back lights will be placed on the cantilever mast with standard cross buck sign.

At least one mast or cantilever at each crossing shall be equipped with top of mast-mounted bell.

### E5.9 Installation

#### E5.9.1 General

Contractor shall be qualified to perform this work, and experience in the installation of railway crossing signal systems. Contractor shall be knowledgeable of crossing signal systems and their operation, and cognizant of all rules and regulations applicable to the project. All installation shall be in accordance with accepted railway signal practice. AREMA guidelines, applicable regulations and these specifications.

All work shall be performed with good workmanship and be of good quality. Where coordination is involved, work shall be performed in a timely fashion.

#### E5.9.2 AC Power

AC power will be supplied to the site by the power utility under the coordination and direction of the City or City's representative. A 60-amp power service will be installed for this location by others.

The Contractor is responsible to:

- (a) Provide a proper compatible entry, meeting electrical code requirements, into the housing.
- (b) Provide underground tech cable from the crossing housing to the new power stub pole or meter box.

#### E5.9.3 Bonding, Insulated Joints, and Connections

The track is jointed. The Contractor shall properly bond all joints up to the approach limits. All connections to rail shall be by approved and accepted current railway signal practice.

Insulated joints shall be installed in accordance with CN Engineering Track Standards. Installation of the insulated joints is to be coordinated with the installation of the road crossing warning systems to maintain safety of the roadway traffic and rail operations.

All cable to track and track connections shall be duly protected, and all underground cable to track shall be installed in accordance with accepted current railway signal practice.

The crossing circuit (X track) shall be minimum 120 feet.

#### E5.9.4 Grounding

A grounding system for the housing equipment shall be installed. Contractor shall supply all grounding material required to ensure grounding is completed in accordance with these Specifications.

Ground connection to the track rails or use of the neutral conductors of the local power utility company, shall not be permitted.

Ground rods shall have the grounding wire attached four (4) inches above to facilitate inspection. Drive ground rods within six (6) inches of the equipment being grounded, in a

location that does not create a tripping hazard. All connections to the ground grid and to ground rods shall be by an approved exothermic weld process.

Test and measure ground resistance of the ground grid using an approved procedure. Add as many ground rods as necessary to ensure the resistance between earth ground and the wayside equipment ground does not exceed twenty-five (25) ohms without the benefit of chemical treatment or other artificial means. Submit ground resistance testing results.

#### E5.9.5 Housing

Install housing, level and plumb, on galvanized steel supports with the bottom of the housing between six (8) and eight (8) inches above the ground line. Maintain a geographical relationship between the housing and the physical track layout. Orient and locate the housing as shown on the plans and maintain required clearances from track and highway.

#### E5.9.6 Design Approach Warning Time

The Design Approach Warning time of each approach to a grade crossing warning system is located on the single line Track Layout plans.

#### E5.9.7 Painting

Contractor shall paint signal apparatus and equipment furnished under this Contract as required by railway signal crossing standards. All paint and painting procedures shall be in accordance with AREMA Signal Manual, Part 2.4.30, where these requirements do not conflict with any requirements of these Specifications.

Surface of equipment and material not accessible after mounting shall have the final finish coat applied prior to installation.

Contractor shall carefully prepare the surface to be painted, and shall use only materials of the highest quality carefully applied in a manner that will provide a durable rust-resistant finish. Structure surfaces damaged or exposed by the Contractor shall be given priming and finish coats.

#### E5.9.8 Protection of Ballast

Contractor shall take all the necessary precautionary measures to ensure that track ballast is not fouled (contaminated with dirt or sub-ballast) during the course of his work. Contractor shall also minimize any disruption to the ballast and shall be responsible to re-dress any ballast, which has been disturbed.

#### E5.9.9 Wire and Cable

Installation of wire and cable shall conform to Part 10.4.1 and Part 10.4.40 of the AREMA Signal Manual, the manufacturer's installation instructions and recommendations, and these Specifications.

Exposed wire and cable will not be permitted along the wayside. Wire end cable insulation shall not come in contact with creosoted lumber.

Wire and cable shall not be bent to a radius of less than twelve (12) times the diameter of the wire or cable during installation or as finally installed.

All exposed wires and cables entering or leaving signal equipment housings, junction boxes, and cable transition points shall be protected from abrasion. Chase nipples and/or split ring plastic grommets shall be provided in drilled or punches openings in equipment housings and junction boxes.

Seal all wire and cable entrances with an approved resilient sealing compound made expressly for the purpose.

Provide sufficient slack in installation of wire and cable for relief of stress due to vibration and to allow for three (3) re-terminations of each conductor without re-servicing or re-pot heading the wire or cable.

Open wiring on equipment racks shall be neatly arranged, bundled, and tied approximately every three (3) inches with nylon straps.

#### E5.9.10 Splices and Terminations

Splices and terminations for wire and cable shall conform to Part 10.4.1 of the AREMA Signal Manual. Additional requirements for splices and terminations are as follows.

Splices will not be permitted in signal wires or cables. Wires and cables shall be continuous between all designed termination points. Exception: Bond strand to #6 track wire splices.

For stranded conductors, terminations shall be made using ring type solderless wire terminals on wire terminal posts in conformance with AREMA Signal Manual Part 14.1.1 and Part 14.1.5. An approved crimping tool shall be used to apply ring terminals to conductors which applies proper, uniform pressure to the ring terminal and which shall not release until proper pressure has been applied.

For solid conductors, forming the conductor into an eye, which fits snugly on the terminal posts, shall make terminations. Wire shall not be nicked or twisted when forming eyes. Formed wire eyes shall be placed on terminals in a manner to ensure closing of the eye when terminal nuts are tightened. An approved wire stripper shall be used to remove insulation from wire, which shall prevent cuts and nicks in the wire. Knives shall not be used for stripping insulation.

All wires and cables shall be terminated in an instrument enclosure or in a signal appliance junction box.

External cable conductors and Internal conductors shall be terminated on separate terminal posts connected by concave test nut terminal connectors in conformance with AREMA Signal Manual Part 14.1.15.

All spare conductors shall be terminated on spare terminal posts and in consecutive wire number order in the same fashion and location as active conductors except where the drawings stipulate spare to be unterminated.

If wire and cable terminations are not made immediately after installation, ends of cable shall be sealed as recommended by the manufacturer to prevent the entrance of moisture.

#### E5.9.11 Tagging

Tagging for wire and cable shall conform to Part 10.4.40 of the AREMA Signal Manual. Additional requirements for tagging are as follows.

Tag all cables where they enter or exit equipment housings or pull boxes with permanent, water proof, pre-typed, wrap around, plastic coated cable tags, or non-metallic, slip-on tags. Tag all cables entering or leaving a location in a manner that is easily readable and not blocked by other cables or equipment.

Tag all wire terminations with permanent, waterproof, pre-typed, non-metallic tags. Termination tags shall contain circuit and terminal nomenclature as identified on the plans.

#### E5.9.12 Masts

Masts shall be installed according to GCS & GCR Road/Railway Grade Crossings, Technical Standards, the Inspection, Testing and Maintenance Requirements and the contract drawings.

#### E5.9.13 Cantilevers

Cantilevers shall be of the walk out type and shall be installed with clearance above the roadway as specified on the Transport Canada Grade Crossings Standards.

#### E5.9.14 Foundations

Foundations for masts shall be installed so that the top of the warning signal foundation shall not be not more than 100 mm (4 inches) above the level of the surrounding ground.

The slope away from the foundation of the surrounding ground towards the traveled portion of the road and the road shoulders shall not exceed the ratio of 4:1.

Foundations shall be installed so that the distance between the edge of traveled way and the edge of the background (or edge of wind bracket if it closer to the road) is a minimum of 625 mm (2 ft.) from the face of curb: minimum of 623 mm (2 ft.) from the outer edge of a shoulder with a minimum of 1.875 m (6 ft) from the edge of the traveled way.

#### E5.9.15 Testing

Contractor shall be qualified to write and perform post installation (PICO) checks and detailed operational commissioning tests of railway crossing signal systems. Contractor shall be knowledgeable of crossing signal systems and their operation, and cognizant of all rules and regulations applicable to the project. All testing shall be in accordance with accepted railway signal practice, AREMA guidelines, applicable regulations and these specifications.

Testing of wire and cable shall conform to Part 10.4.30 of the AREMA Signal Manual and the manufacturers instructions and recommendations. Additional requirements for testing are as follows.

All wires and cables shall be tested after installation to ensure continuity and to verify isolation between conductors, isolation of each conductor from ground, and coned terminal and tag designations.

Prior to testing, terminate and tag cables in their final configuration and on final terminals and verify that all conductors are isolated from equipment that may be damaged by test voltages.

Perform wire ring-out test between cable ends to verify terminations and tags are correct per the plans. Correct and document any discrepancies and re-test immediately.

Perform insulation resistance tests. Insulation resistance tests shall be conducted when all wires, cables, and insulation are dry. Test all wire and cable installed for insulation resistance between conductors, and between conductors and ground using a 1,000 VDC megger. A minimum of five (5) megaohms shall be required for each test. Actual resistance reading shall be recorded on test forms and shall be submitted.

Vital relay pickup and drop away value tests shall be performed, recorded and submitted.

All tests shall be recorded on appropriate forms, dated and signed.

Test records shall be submitted with the as installed drawings.

#### E5.10 Measurement and Payment

E5.10.1 Unless otherwise specified, the Contractor shall supply all materials necessary to complete the Work. A complete job is called for, therefore any labor, mobilization, material, equipment, tool or incidental item not specifically mentioned, but necessary for completeness will be considered incidental to the Work, and no separate or additional payment will be made.

E5.10.2 "Bungalow with foundation and all equipment installed and wired" will be paid at the lump sum price bid. The lump sum price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.

E5.10.3 "Power Feed Cabling" will be paid at the lump sum price bid. The lump sum price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.

E5.10.4 "Foundations for Cantilevers and Mast" will be paid by linear meter. The unit price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.



- E5.10.5 "Cantilevers and Masts with LED Flashers" will be paid at the lump sum price bid. The lump sum price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.
- E5.10.6 "Cabling to Cantilevers and Masts" will be paid at the lump sum price bid. The lump sum price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.
- E5.10.7 "Track-related Work including track circuit cabling, insulated joints and diodes" will be paid at the lump sum price bid. The lump sum price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.
- E5.10.8 "Testing and Commissioning" will be paid at the lump sum price bid. The lump sum price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.
- E5.10.9 "Demolition Work including the existing control box and power feed, hydro poles, cantilevers, and cantilever foundations" will be paid at the lump sum price bid. The lump sum price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.

## **E6. CAST-IN-PLACE CONCRETE PILE FOUNDATIONS FOR CANTILEVERS AND MASTS**

### **E6.1 Description**

The Work covered under this Item shall include all concreting operations related to construction of cast-in-place concrete pile foundations for new cross warning signal structures in accordance with this Specification and as shown on the Drawings.

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.

The requirements of the following sections of Manitoba Infrastructure and Transportation Water Control and Structures Design Manual shall be followed unless otherwise noted:

- (a) Section 1000 – Structural Excavation
- (b) Section 1030 – Reinforced Cast in place Concrete
- (c) Section 1038 – Supplying and Placing Reinforcement

### **E6.2 Referenced Specifications and Drawings**

- (a) Manitoba Infrastructure and Transportation Water Control and Structures Design Manual
- (b) CAN/CSA-S6, Canadian Highway Bridge Design Code.
- (c) AASHTO Standard Specifications for Structural Support for Highway Signs, Luminaires, And Traffic Signals.
- (d) CAN/CSA A23.1 - Concrete materials and methods of concrete construction.
- (e) CAN/CSA G30.18 - Carbon Steel Bars for Concrete Reinforcement.
- (f) ASTM A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- (g) ASTM A123- Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

### **E6.3 Scope of Work**

- (a) Excavate Shaft for Pile Foundation
- (b) Supply and Install Steel Reinforcing for Pile Foundation

(c) Supply and Place Structural Concrete for Pile Foundation

E6.4 Materials

E6.4.1 General

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.

E6.4.2 Cement

Shall be Type HS or HSb, high-sulphate-resistant hydraulic cement, conforming to the requirements of CSA A23-1.

E6.4.3 Reinforcing Steel

Reinforcing Steel shall be deemed to include all reinforcing bars, tie-bars, and dowels.

All reinforcing steel shall conform to the requirements of CSA Standard G30.18, Grade 400 W, Billet-Steel Bars for Concrete Reinforcement. All reinforcing steel shall be new deformed billet steel bars. Reinforcing steel supply and installation will be incidental to construction of concrete pile foundation and no separate payment will be made.

E6.4.4 Anchor Bolts, Nuts, and Washers

Anchor bolts design shall be in accordance with AASHTO Standard Specifications for Structural Support for Highway Signs, Luminaires, And Traffic Signals.

Anchor bolts, nuts, and washers shall be in accordance with ASTM F1554 (Grade 55), and shall be hot-dip galvanized full length in accordance with ASTM F2329 for a minimum net retention of 610 g/m<sup>2</sup>, for the entire length of the anchor bolts. The threaded portion of the anchor bolts shall be as shown on the drawings. Anchor bolt supply and installation will be incidental to construction of concrete pile foundation and no separate payment will be made.

E6.4.5 Anchor Bolt Templates

Anchor bolt templates shall be CSA G40.21 Grade 300W steel, minimum 10 mm thick, and will be incidental to construction of new concrete pile foundation and no separate payment will be made.

E6.4.6 Miscellaneous Materials

Miscellaneous materials shall be of the type specified on the Drawings or approved by the Contract Administrator, and will be incidental to construction of new concrete pile foundation and no separate payment will be made.

E6.5 Construction Methods

E6.5.1 Location and Alignment of Piles

- (a) Pile construction shall not commence until the Contractor has obtained clearance from the appropriate Utility Authorities including but not limited to Manitoba Hydro, MTS and City of Winnipeg Water and Waste.
- (b) Piles shall be placed in the positions shown on the Drawings and as directed by the Contract Administrator in the field. Pile heads to be within 150 mm of locations as indicated.
- (c) The deviation of the axis of any finished pile shall not differ by more than one percent (1%) from the vertical.
- (d) If tolerances are not met, the Contractor will make immediate changes to his piling procedures. Any pile out of the specified tolerance will be corrected at the Contractor's expense to the full satisfaction of the Design Professional.

## E6.6 Buried Utilities

- E6.6.1 The Contractor shall exercise extreme caution when constructing the pile foundations in the vicinity of existing buried utilities and buildings. The Drawings show the approximate locations of existing buried utilities. The Contractor shall be responsible for verifying and obtaining the exact location of the buried utilities from the appropriate utility authorities prior to installing the piles.
- E6.6.2 The Contractor shall be responsible for all costs that may be incurred for repair/rectification of any damage caused to the existing buried utilities as a result of the Contractor's operations in constructing cast-in-place concrete piles, as determined by the Contract Administrator.

## E6.7 Excavation

- E6.7.1 Pile excavation shall be achieved by auguring (i.e. drilling) or hydro-jet excavation for the full depth of all piles.
- E6.7.2 It may be necessary to hydro-jet excavate utilities adjacent to a pile location to adequately ascertain the location or provide enough "slack" in conduits to move them slightly to avoid interference with the pile locations. The Contract Administrator may elect to alter the location of a pile if hydro-jet excavation shows that utilities cannot be avoided.
- E6.7.3 If any hole is condemned because of caving, it shall be filled with lean-mix concrete and a new hole excavated as near as possible to the location shown on the Drawings. In locations where underground utilities have been exposed, the underground utilities shall be covered with clean sand to 300 mm minimum cover around the utility. Payment will not be made for condemned piles.
- E6.7.4 Upon reaching the required bottom elevation, the bottom of the excavation shall be cleaned using typical methods, to a level deemed acceptable by the Contract Administrator in the field.
- E6.7.5 Upon completion of the cleaning out of the bottom to the satisfaction of the Contract Administrator, the reinforcement shall be set in place and the concrete poured immediately. Under no circumstances shall a hole be left to stand open after excavation has been completed.
- E6.7.6 All excavated material shall be promptly hauled away from the Site to an approved disposal area as located by the Contractor. Removal of material is considered incidental to the work and no separate payment will be made.

## E6.8 Sleeving

- E6.8.1 Steel or corrugated metal pipe sleeving shall be used if required to temporarily line the excavation to prevent bulging or caving of the walls.
- E6.8.2 The sleeving shall be designed by the Contractor and constructed to resist all forces that may tend to distort it.
- E6.8.3 The sleeving shall be withdrawn as the concrete is placed in the excavation. The sleeving shall extend at least 1 m below the top of the freshly deposited concrete at all times.
- E6.8.4 The clearance between the face of the excavation and the sleeving shall not exceed 75 mm.

## E6.9 Inspection of Excavations

- E6.9.1 Concrete shall not be placed in an excavation until the excavation has been inspected and approved by the Contract Administrator.
- E6.9.2 The Contractor shall have available suitable light for the inspection of each excavation throughout its entire length.

- E6.9.3 Any improperly set sleeving or improperly prepared excavation shall be corrected to the satisfaction of the Contract Administrator.
- E6.10 Placing Reinforcing Steel
- E6.10.1 Reinforcement shall be:
- (a) placed in accordance with the details shown on the Drawings;
  - (b) rigidly fastened together; and
  - (c) lowered into the excavation intact before concrete is placed.
- E6.10.2 Spacers shall be utilized to properly locate the reinforcing steel cage in the excavation.
- E6.11 Placing Anchor Bolts
- E6.11.1 The anchor bolts shall be aligned with the steel templates matching the bolt holes in the sign structure base plate. The setting templates shall be held in place by the top and bottom nuts of the anchor bolts. The anchor bolts shall be plumb. Extreme care shall be used in this operation. Placement of anchor bolts without the steel template will not be permitted.
- E6.11.2 The threaded portion of the anchor bolts projecting above the top surface of pile shall be coated with oil, before the concrete is poured, to minimize the fouling of threads splattered by concrete residue.
- E6.12 Forms
- E6.12.1 The tops of cast-in-place concrete piles shall be formed with tubular forms (Sonotube) to a minimum depth below final grade as shown on the drawings.
- E6.12.2 In locations of caving, the tubular form (Sonotube) should extend a minimum of 500 mm below where the shaft becomes uniform.
- E6.12.3 The forms shall be sufficiently rigid to prevent lateral or vertical distortions from the loading environment to which they shall be subjected. Forms shall be set to the design grades, lines, and dimensions, as shown on the Drawings.
- E6.13 Placing Concrete
- E6.13.1 Care shall be taken to ensure that anchor bolts are vertically aligned and that anchor bolts are properly positioned prior to placement of concrete.
- E6.13.2 Concrete shall not have a free fall of more than 2.0 m and shall be placed so that the aggregates will not separate or segregate. The slump of the concrete shall not exceed 110 mm. The concrete shall be vibrated throughout the entire length of the pile.
- E6.13.3 Concrete shall be placed to the elevations as shown on the Drawings. The top surface of the pile shall be given a hand-roughened finish acceptable to the Contract Administrator.
- E6.13.4 The top of the pile shall be finished smooth with a hand float and provided with a one percent (2%) slope for drainage away from the centreline.
- E6.14 Tremie Concrete for Piles
- E6.14.1 If groundwater flow persists into the drilled shaft, the shaft of the pile shall be pumped clear of water so that the bottom can be cleaned. Pumping shall then be stopped and water shall be allowed to come into the excavation until a state of equilibrium is reached. Concrete may then be placed by means of a tremie pipe. The tremie pipe shall have a suitable gate in the bottom to prevent water from entering the pipe. The bottom of the pipe shall be maintained below the surface of the freshly placed concrete. The pipe shall be capable of being raised or lowered quickly in order to control the flow of concrete.
- E6.14.2 Tremie concrete shall be poured up to a depth of 600 mm or as the Contract Administrator directs. Pumps shall then be lowered into the excavation and the excess water pumped

out. The laitance that forms on top of the tremie shall then be removed and the remainder of the concrete shall be placed in the dry excavation.

#### E6.15 Protection of Newly Placed Concrete

E6.15.1 Newly laid concrete threatened with damage by rain, snow, fog, or mist shall be protected with a tarpaulin or other approved means.

#### E6.16 Curing Concrete

E6.16.1 The top of the freshly finished concrete pile and pile cap shall be covered and kept moist by means of wet polyester blankets immediately following finishing operations and shall be maintained at above 10°C for at least seven (7) consecutive days thereafter.

E6.16.2 After the finishing is completed, the surface shall be promptly covered with a minimum of a single layer of clean, damp polyester blanket.

E6.16.3 Concrete shall be protected from the harmful effects of sunshine, drying winds, surface dripping or running water, vibration, and mechanical shock. Concrete shall be protected from freezing until at least twenty-four hours after the end of the curing period.

E6.16.4 Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3° in one hour or 20° in twenty-four hours.

#### E6.17 Form Removal

E6.17.1 Forms shall not be removed for a period of at least 24 hours after the concrete has been placed. Removal of forms shall be done in a manner to avoid damage to, or spalling of, the concrete.

E6.17.2 The minimum strength of concrete in place for safe removal of forms shall be 20 MPa.

E6.17.3 Field-cured test specimens, representative of the in-place concrete being stripped, will be tested to verify the concrete strength.

#### E6.18 Patching of Formed Surfaces

E6.18.1 Immediately after forms around top of pile have been removed, but before any repairing or surface finishing is started, the concrete surface shall be inspected by the Contract Administrator. Any repair of surface finishing started before this inspection may be rejected and required to be removed.

E6.18.2 All formed concrete surfaces shall have bolts, ties, struts, and all other timber or metal parts not specifically required for construction purposes cut back fifty (50) mm from the surface before patching.

E6.18.3 Minor surface defects caused by honeycomb, air pockets greater than 5 mm in diameter, and voids left by strutting, and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the area to be patched and then applying patching mortar. A slurry grout consisting of water and cement, shall be well-brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck-off slightly higher than the surface and left for one hour before final finishing to permit initial shrinkage of the patching mortar and it shall be touched up until it is satisfactory to the Contract Administrator. The patch shall be cured as specified in this Specification, and the final colour shall match the surrounding concrete.

#### E6.19 Cold Weather Concreting

E6.19.1 Protection of concrete shall be considered incidental to its placement. The temperature of the concrete shall be maintained at or above 10°C for a minimum of three (3) days or till the concrete has reached a minimum compressive strength of 20 MPa, by whatever means are necessary. Concrete damaged as a result of inadequate protection against weather conditions shall be removed and replaced by the Contractor at their own expense. Also, concrete allowed to freeze prior to the three (3) days will not be accepted for payment.

## E6.20 Repair and Restoration

- E6.20.1 Pull out rejected piles and replace with new piles.
- E6.20.2 Remove rejected pile and replace with new, and if necessary, longer pile.
- E6.20.3 Remove rejected pile and fill hole as directed by Design Professional.
- E6.20.4 No extra compensation will be made for removing and replacing or other work made necessary through rejection of defective piles.

## E6.21 Cleaning

- E6.21.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

## E6.22 Measurement and Payment

- E6.22.1 Payment for "Cast-In-Place Concrete Pile Foundations for Cantilevers and Masts" shall be based on agreed unit price per pile unit length as per approved Drawings, which includes all things necessary for and incidental to the satisfactory performance and completion of cast-in-place reinforced concrete piles for the new cross warning signal structures.
- E6.22.2 No separate payment will be made for mobilization, pile testing or other items of this Section in respect to pile installation. This shall be considered full compensation for all costs related to this work including all subsidiary and incidental items necessary for which separate payment is not elsewhere provided including access, labour, materials and equipment necessary to complete the Work.

## E7. BUNGALOW ACCESS ROAD

### E7.1 Description

The Work covered under this Item shall include all operations related to construction of an access road to the future bungalow location in accordance with this Specification and as shown on the Drawings.

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.

### E7.2 Referenced Specifications

- (a) City of Winnipeg Standard Construction Specification CW 3010.
- (b) City of Winnipeg Standard Construction Specification CW 3110.
- (c) City of Winnipeg Standard Construction Specification CW 3030.
- (d) City of Winnipeg Standard Construction Specification CW 3170.
- (e) City of Winnipeg Standard Construction Specification CW 3520.
- (f) City of Winnipeg Standard Construction Specification CW 3610.
- (g) Manitoba Infrastructure Standard Construction Specification No. 1296.
- (h) Manitoba Infrastructure Standard Construction Specification No. 1298.

### E7.3 Materials

#### E7.3.1 Imported Fill Material

- (a) Imported Fill material shall be supplied by the Contractor as per CW 3110.

#### E7.3.2 Base Course and Sub-Base Material

- (a) Granular C Base Course and Sub-Base material shall be supplied by the Contractor as per CW 3110.

E7.3.3 Geotextile Fabric

- (a) Separation Geotextile Fabric shall be supplied by the Contractor as per CW 3130.

E7.3.4 Erosion Control

- (a) Silt fence fabric and stakes shall be supplied per Manitoba Infrastructure Specification No. 1296.
- (b) Erosion control blanket shall be supplied per Manitoba Infrastructure Specification No. 1298.

E7.3.5 Topsoil and Seed

- (a) Topsoil and seed shall be supplied by the Contractor as per CW 3520.

E7.3.6 Culvert Extension

- (a) 1000mm Corrugated Steel Pipe (CSP) Culvert shall be supplied by the Contractor as per CW 3610.

E7.4 Construction Methods

E7.4.1 Earthwork and grading

- (a) Clearing and grubbing shall be completed as per CW 3010.
- (b) Topsoil and vegetation excavation, common excavation, waste excavation, disposal of excavated material, preparation of existing ground surface, embankment, compaction, finishing and maintaining shall be completed as per CW 3170.
- (c) Bench cuts shall consist of excavating horizontal cuts into the slopes of the existing railway embankment prior to placing widening material thereon. Bench cuts shall be made at vertical intervals of 1.0 m, with the base of the initial bench cut being approximately 0.5 m above the toe of the existing slope. The base of each bench cut shall extend into the existing slope a minimum of 2 m. Suitable material resulting from the bench cut shall be incorporated and compacted into the new embankment. Unsuitable material shall be disposed of as directed by the Engineer.

E7.4.2 Placing Imported Fill, Sub-base and Base Course

- (a) Imported Fill, Sub-base and Base Course shall be placed as per CW 3110. Requests for approved equals may also be considered.

E7.4.3 Geotextile

- (a) Separation Geotextile Fabric shall be placed as per CW 3130.

E7.4.4 Erosion Control

- (a) Silt Fence barrier shall be placed as per Manitoba Infrastructure Specification No. 1296.
- (b) Erosion control blanket shall be placed as per Manitoba Infrastructure Specification No. 1298.

E7.4.5 Topsoil and Seed

- (a) Topsoil and seed shall be placed as per CW 3520.

E7.4.6 Culvert Extension

- (a) 1000mm Corrugated Steel Pipe (CSP) Culvert shall be installed by the Contractor as per CW 3610.
- (b) A connection to an existing CSP culvert is required.

E7.5 Quality Control

E7.5.1 Quality control methods and requirements shall adhere to corresponding specifications designated in E7.3 and E7.4.

E7.6 Measurement and Payment

E7.6.1 "Bungalow Access Road" will be paid at the lump sum price bid. The lump sum price will be considered full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Consultant.

E7.6.2 No separate payment will be made for mobilization, site restoration, or other items of this Specification in respect to access road construction. This shall be considered full compensation for all costs related to this work including all subsidiary and incidental items necessary for which separate payment is not elsewhere provided including access, labour, materials and equipment necessary to complete the Work.



## PART F - SECURITY CLEARANCE

### F1. SECURITY CLEARANCE

F1.1 Each individual proposed to perform Work under this Contract within facilities associated with the water supply, treatment and distribution system including the Shoal Lake Intake Facility, Shoal Lake Aqueduct, Deacon Reservoir, Water Treatment Plant, Regional Pumping Stations, and Booster Pumping Stations shall be required to obtain a Public Safety Verification Check **and** a Police Information Check as detailed below.

F1.1.1 The Public Safety Verification Check must be obtained through Sterling BackCheck.

- (a) A Sterling BackCheck account must be setup 72 hours prior to individual security clearances to allow sufficient time for activation of the contracting company's account. If the contracting company has an existing City of Winnipeg Sterling Backcheck vendor account, they may skip to (d) below.
- (b) An authorized individual of the contracting company must complete the Sterling Backcheck Setup Form. There is no cost to the organization to set up the account. Click on the link below, complete the form, and hit submit. **\*\***(This form is to be completed by the company, not by the employee requiring the security clearances).  
<https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity>
- (c) Within 48 hours of completing the Sterling Backcheck Setup Form, the authorized individual of the contracting company will receive a Username and Password for Sterling Backcheck. It will appear in their inbox as a "Welcome to Sterling Backcheck" email. Upon receipt, the authorized individual of the contracting company will be asked to login to the Sterling Backcheck website to set their security questions and password. Once completed, individual security clearance requests can be submitted.
- (d) In order to run a Public Safety Verification Check and/or a Police Information Check, follow the steps below:
  - (i) Click on the sub-tab labelled "Order eConsent".
  - (ii) Fill out the required information about the employee proposed to perform Work under this Contract within City facilities (the person that requires the security clearances).
  - (iii) Select your location under the "Order Information" section and enter the organization's phone number, if required.
  - (iv) Select the required individual service(s) in the dropdown menu under the "Select Services" section. If both the Public Safety Verification Check and the Police Information Check are required, select the Sterling Backcheck Package One (with electronic identity verification). Once selected, both the Public Safety Verification Check and the Police Information Check should have a grey check mark beside them.
  - (v) Scroll down to the bottom and click the blue "Submit" button. The employee proposed to perform Work under this Contract within City facilities will be invited to complete their security clearance.
  - (vi) The employee will receive the invitation and must click on the link and complete their Public Safety Verification Check and/or Police Information Check.
  - (vii) The results of the Public Safety Verification Check and/or Police Information Check will go directly to the City of Winnipeg and to the authorized individual of the contracting company within 24 hours.
- (e) Any questions related to the Sterling BackCheck process can be directed to Linda Ferens at 204-999-0912 or by email at: [linda.ferens@sterlingcheck.com](mailto:linda.ferens@sterlingcheck.com) OR [managedsupport@sterlingcheck.com](mailto:managedsupport@sterlingcheck.com)

F1.1.2 The Police Information Check must be obtained from one of the following:

- (a) Sterling BackCheck;
  - (i) See F1.1.1(a) thru (e) for instructions on how to set up an account and submit individuals for security checks; or

- (b) A police service having jurisdiction at his/her place of residence;
    - (i) The original Police Information Check (Form P-612) will be provided by the Winnipeg Police Service to the individual applicant. The original has a validation sticker from the Winnipeg Police Service in the top right hand corner.
    - (ii) The applicant shall provide the original Police Information Check (Form P-612) to the Contract Administrator; or
  - (c) Commissionaires (Manitoba Division);
    - (i) Forms to be completed can be found on the website at:  
<https://www.commissionaires.ca/en/manitoba/home>
    - (ii) The applicant shall provide the original Police Information Check to the Contract Administrator; or
  - (d) FASTCHECK Criminal Record & Fingerprint Specialists;
    - (i) Forms to be completed can be found on the website at:  
<https://myfastcheck.com>
    - (ii) The applicant shall provide the original Police Information Check to the Contract Administrator.
- F1.2 Any individual for whom a Public Safety Verification Check and/or a Police Information Check is not provided will not be permitted to perform any Work.
- F1.3 Individuals for whom a Public Safety Verification Check indicates “CLEAR” and a Police Information Check demonstrates no previous convictions or pending charges will be permitted to perform Work as specified in F1.1.
- F1.4 Individuals for whom a Public Safety Verification Check does not indicate “CLEAR” and/or a Police Information Check demonstrates previous convictions or pending charges may not be permitted to perform any Work as specified in F1.1.
- (a) Previous convictions or pending charges may be investigated and a determination will be made by the City as to whether the individual will be permitted to perform any Work.
  - (b) Convictions or pending charges that may preclude an individual from performing any Work include but are not limited to:
    - (i) convictions or pending charges related to property offences; and/or
    - (ii) convictions or pending charges related to crimes against another person.
  - (c) Where additional investigation related to a Public Safety Verification Check or a Police Information Check is required by the City, no extension to critical stages, Substantial Performance, or Total Performance, as applicable, will be provided.
  - (d) Additional investigation by the City may take upwards of six weeks.
- F1.5 Prior to the award of Contract, and during the term of the Contract, if additional or replacement individuals are proposed to perform Work within City facilities, the Contractor shall supply the Contract Administrator with a Public Safety Verification Check and a Police Information Check satisfactory to the City obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform the Work.
- F1.6 Any Public Safety Verification Check and Police Information Check determined to be satisfactory to the City will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.
- F1.7 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated Public Safety Verification Check and/or a Police Information Check. Any individual F1.1 who fails to provide a Public Safety Verification Check and/or a Police Information Check satisfactory to the City as a result of a repeated records search will not be permitted to continue to perform any Work as specified in F1.1.