



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 327-2016

**STEEL OVERHEAD SIGN SUPPORT STRUCTURES – 2016 MAINTENANCE
WORKS**

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 STEEL OVERHEAD SIGN SUPPORT STRUCTURES – 2016 MAINTENANCE WORKS

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is Noon, Winnipeg time, July 6, 2016.

B2.2 Bids determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.

B2.3 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. SITE INVESTIGATION

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

B3.2 The Bidder is advised that high voltage transmission lines owned by Manitoba Hydro are in close proximity to sign structure site S654. Manitoba Hydro distribution lines are also in proximity to sign structure site S654. The presence of these lines may affect the Contractor's site operations.

B4. ENQUIRIES

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

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

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

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

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

B5. CONFIDENTIALITY

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

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

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

B6. ADDENDA

- B6.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.
- B6.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B6.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B6.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B6.2.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 8 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B7. SUBSTITUTES

- B7.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B7.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B7.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B7.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B7.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an "approved equal" or as an "approved alternative", or may refuse to grant approval of the substitute.
- B7.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.

- B7.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods, and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B16.
- B7.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B8. BID COMPONENTS

- B8.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
 - (b) Form B: Prices;
- B8.2 Further to B8.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B7.
- B8.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B8.4 The Bid Submission may be submitted by mail, courier or personal delivery, or by facsimile transmission.
- B8.5 If the Bid Submission is submitted by mail, courier or personal delivery, it shall be enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address, and shall be submitted to:
- The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg, MB R3B 1J1
- B8.5.1 Samples or other components of the Bid Submission which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid Submission.
- B8.6 Bidders are advised not to include any information/literature except as requested in accordance with B8.1.
- B8.7 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B16.1(a).
- B8.8 If the Bid Submission is submitted by facsimile transmission, it shall be submitted to 204 949-1178.
- B8.8.1 The Bidder is advised that the City cannot take responsibility for the availability of the facsimile machine at any time.
- B8.8.2 Bids submitted by internet electronic mail (e-mail) will not be accepted.

B9. BID

- B9.1 The Bidder shall complete Form A: Bid, making all required entries.
- B9.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
 - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
 - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
 - (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B9.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B9.2.
- B9.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B9.4 Paragraph 10 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
 - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
 - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers;
 - (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B9.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.
- B9.4.2 All signatures shall be original.
- B9.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B10. PRICES

- B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B10.2 The quantities listed on Form B: Prices, are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B10.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.
- B10.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B11. DISCLOSURE

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

B11.2 The Persons are:

(a) N/A

B11.3 Additional Material:

(a) N/A

B12. QUALIFICATION

B12.1 The Bidder shall:

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

B12.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/debar.stm>

B12.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) have successfully carried out work similar in nature, scope and value to the Work; and
- (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
- (c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba);

B12.4 Further to B12.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractors has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

- (a) 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
- (b) 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
- (c) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>).

B12.5 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B12.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B13. OPENING OF BIDS AND RELEASE OF INFORMATION

B13.1 Bids will not be opened publicly.

B13.2 Following the submission deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>

B13.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

B13.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B14. IRREVOCABLE BID

B14.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 9 of Form A: Bid.

B14.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work for the time period specified in Paragraph 9 of Form A: Bid.

B15. WITHDRAWAL OF BIDS

B15.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B15.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

B15.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

B15.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

- (a) retain the Bid until after the Submission Deadline has elapsed;
- (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B15.1.3(b), declare the Bid withdrawn.

B15.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B14.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law.

B16. EVALUATION OF BIDS

B16.1 Award of the Contract shall be based on the following bid evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Bid Opportunity or acceptable deviation there from (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B12 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B7.

B16.2 Further to B16.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B16.3 Further to B16.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.

B16.4 Further to B16.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B16.4.1 Further to B16.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B17. AWARD OF CONTRACT

B17.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B17.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B17.2.1 Without limiting the generality of B17.2, the City will have no obligation to award a Contract where:

- (a) the prices exceed the available City funds for the Work;
- (b) the prices are materially in excess of the prices received for similar work in the past;
- (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
- (d) only one Bid is received; or
- (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B17.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B16.

B17.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

- B17.4 Notwithstanding C4, the City may issue a Purchase Order to the successful Bidder in lieu of the execution of a Contract.
- B17.5 The Contract, as defined in C1.1, in its entirety shall be deemed to be incorporated in and to form a part of the Purchase Order notwithstanding that it is not necessarily attached to or accompany said Purchase Order.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm
- C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Construction*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of steel overhead sign support structure maintenance works.

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

- (a) removal of existing steel overhead sign support structures;
- (b) refurbishment and modification of existing concrete foundations;
- (c) fabrication and installation of a new steel overhead sign support structure; and
- (d) removal, refurbishment, modification, and reinstallation of existing steel overhead sign support structure.

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is Dillon Consulting Limited, represented by:

Robert Taylor, P.Eng.
Project Manager

Telephone No. 204 453 2353x4082
Facsimile No. 204 452 4412

D3.2 At the pre-construction meeting, Robert Taylor will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D3.3 Bids Submissions must be submitted to the address in B8.5.

D4. CONTRACTOR'S SUPERVISOR

D4.1 At the pre-construction meeting, the Contractor shall identify his/her designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D5. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

D5.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.

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

D5.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator:

- (a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;
- (b) the Contract, all deliverables produced or developed; and
- (c) any statement of fact or opinion regarding any aspect of the Contract.

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

D6. NOTICES

D6.1 Except as provided for in C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.

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

D6.3 Notwithstanding C21., all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:

The City of Winnipeg
Chief Financial Officer

Facsimile No.: 204 949-1174

D6.4 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following facsimile number:

The City of Winnipeg
Legal Services Department
Attn: Director of Legal Services

Facsimile No.: 204 947-9155

D6.5 Bids Submissions must be submitted to the address in B8.5.

SUBMISSIONS

D7. AUTHORITY TO CARRY ON BUSINESS

D7.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

D8. SAFE WORK PLAN

D8.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D8.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Safety/default.stm>

D9. INSURANCE

- D9.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
 - (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than two million dollars (\$2,000,000.00) inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence;
 - (c) all risks installation floater, carrying adequate limits to cover all machinery, equipment, supplies and/or materials intended to enter into and form part of any installation.
- D9.2 Deductibles shall be borne by the Contractor.
- D9.3 The Contractor shall provide the Contract Administrator with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than seven (7) Calendar Days from notification of the award of Contract by Purchase Order.
- D9.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D10. PERFORMANCE SECURITY

- D10.1 If the Contract Price exceeds twenty-five thousand dollars (\$25,000.00), the Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
 - (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
 - (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.
- D10.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.
- D10.2 The Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of Purchase Order and prior to the commencement of any Work on the Site.

D11. SUBCONTRACTOR LIST

D11.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of Contract.

SCHEDULE OF WORK

D12. COMMENCEMENT

D12.1 The Contractor shall not commence any Work until he/she is in receipt of a Purchase Order from the Award Authority authorizing the commencement of the Work.

D12.2 The Contractor shall not commence any Work on the Site until:

- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D7;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D8;
 - (iv) evidence of the insurance specified in D9;
 - (v) the performance security specified in D10; and
 - (vi) the Subcontractor list specified in D11.
- (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;
- (c) the Contractor has attended an on-site pre-construction meeting with the Contract Administrator and Manitoba Hydro (applicable to sign structure site S654 only).

D12.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the Purchase Order.

D12.4 The City intends to award this Contract by July 15, 2016.

D12.4.1 If the actual date of award is later than the intended date, the dates specified for substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

D13. SUBSTANTIAL PERFORMANCE

D13.1 The Contractor shall achieve Substantial Performance by October 14, 2016 .

D13.2 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.

D13.3 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.

D14. TOTAL PERFORMANCE

D14.1 The Contractor shall achieve Total Performance by October 28, 2016.

- D14.2 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.
- D14.3 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.

D15. LIQUIDATED DAMAGES

- D15.1 If the Contractor fails to achieve Total Performance in accordance with the Contract by the day fixed herein for Total Performance, the Contractor shall pay the City five hundred fifty dollars (\$550) per Calendar Day for each and every Calendar Day following the day fixed herein for Total Performance during which such failure continues.
- D15.2 The amount specified for liquidated damages in D15.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Total Performance by the day fixed herein for same.
- D15.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

CONTROL OF WORK

D16. JOB MEETINGS

- D16.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one (1) representative of the Contract Administrator, one (1) representative of the City, and one (1) 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.
- D16.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

D17. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

- D17.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

D18. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

- D18.1 Further to B12.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B12.4.

MEASUREMENT AND PAYMENT

D19. PAYMENT

- D19.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D20. WARRANTY

- D20.1 Notwithstanding C13.2, the warranty period shall begin on the date of Substantial Performance and shall expire one (1) year thereafter unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.
- D20.2 Notwithstanding C13.2 or D20.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Substantial Performance if:
- (a) a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.
- D20.2.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

FORM H1: PERFORMANCE BOND
(See D10)

KNOW ALL MEN BY THESE PRESENTS THAT

_____ ,
(hereinafter called the "Principal"), and

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

_____ dollars (\$_____)

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

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

BID OPPORTUNITY NO. 327-2016

STEEL OVERHEAD SIGN SUPPORT STRUCTURES – 2016 MAINTENANCE WORKS

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

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

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

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

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

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

_____ day of _____, 20____ .

SIGNED AND SEALED
in the presence of:

(Witness as to Principal if no seal)

(Name of Principal)

Per: _____ (Seal)

Per: _____

(Name of Surety)

By: _____ (Seal)
(Attorney-in-Fact)

**FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)**
(See D10)

(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 327-2016

STEEL OVERHEAD SIGN SUPPORT STRUCTURES – 2016 MAINTENANCE WORKS

Pursuant to the request of and for the account of our customer,

(Name of Contractor)

(Address of Contractor)

WE HEREBY ESTABLISH in your favour our irrevocable Standby Letter of Credit for a sum not exceeding in the aggregate

_____ Canadian dollars.

This Standby Letter of Credit may be drawn on by you at any time and from time to time upon written demand for payment made upon us by you. It is understood that we are obligated under this Standby Letter of Credit for the payment of monies only and we hereby agree that we shall honour your demand for payment without inquiring whether you have a right as between yourself and our customer to make such demand and without recognizing any claim of our customer or objection by the customer to payment by us.

The amount of this Standby Letter of Credit may be reduced from time to time only by amounts drawn upon it by you or by formal notice in writing given to us by you if you desire such reduction or are willing that it be made.

Partial drawings are permitted.

We engage with you that all demands for payment made within the terms and currency of this Standby Letter of Credit will be duly honoured if presented to us at:

(Address)

and we confirm and hereby undertake to ensure that all demands for payment will be duly honoured by us.

All demands for payment shall specifically state that they are drawn under this Standby Letter of Credit.

Subject to the condition hereinafter set forth, this Standby Letter of Credit will expire on

(Date)

It is a condition of this Standby Letter of Credit that it shall be deemed to be automatically extended from year to year without amendment from the present or any future expiry date, unless at least 30 days prior to the present or any future expiry date, we notify you in writing that we elect not to consider this Standby Letter of Credit to be renewable for any additional period.

This Standby Letter of Credit may not be revoked or amended without your prior written approval.

This credit is subject to the Uniform Customs and Practice for Documentary Credit (2007 Revision), International Chamber of Commerce Publication Number 600.

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

- E1.1 These Specifications shall apply to the Work.
- E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Spec/Default.stm>
- E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.3 The following are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
OHSS-16-01	Cover Sheet
OHSS-16-02	Site Locations
OHSS-16-03	Description of Works
S654-16-01	S654 Bishop Grandin Blvd. WB, 2 nd Structure East of Pembina Hwy.
TLS-088-16-01	TLS-088 Vaughan Street Southbound North of Portage Avenue
TLS-088-16-02	TLS-088 Details

E2. HAZARDOUS MATERIALS

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

E3. PERMITS, LICENCES, CERTIFICATES, LAWS, AND RULES

- E3.1 The Contractor shall give all necessary notices, obtain all necessary permits and pay all fees in order that the Work may be carried out. The Contractor shall submit all plans required by any inspection authority and obtain approval of same before proceeding with the Work and pay any cost attached to the inspection of such plans.
- E3.2 The Contractor shall comply with all laws, ordinances, rules, and regulations that would relate to the Work.
- E3.3 The Contractor and Subcontractors must be fully aware of all Work involving hazardous materials. All Work must be performed in compliance to the Manitoba Department of Labour Workplace Health and Safety Guidelines and all other applicable codes. The Contractor is responsible for the immediate notification to the Contract Administrator of his/her encountering of suspected hazardous material during their course of Work.

E4. EXISTING SERVICES AND UTILITIES

- E4.1 No responsibility will be assumed by the City for correctness or completeness of the Drawings with respect to the existing utilities, pipes or other objects either underground or on the surface; the City shall not be liable for the incorrectness and inadequacy thereof. It shall be the responsibility of the Contractor to determine the location of such utilities, pipes, and other objects and to make good any damage done to them.
- E4.2 Prior to removing or installing overhead sign structures located near overhead wires, the Contractor shall arrange with utility companies, including but not limited to Manitoba Hydro, the provision of all necessary precautions required to safely remove or install the structure. No separate measurement or payment will be made for the provision of safety precautions for working near overhead wires.

E5. DAMAGE TO EXISTING STRUCTURES AND PROPERTY

- E5.1 All necessary precautions shall be exercised by the Contractor so as not to remove, disturb, or damage any existing water pipes, gas pipes, electrical wires, cables, conduits, sewers, or other existing facilities and equipment at the Site of the Work. For all damage incurred thereto in the performance of the Work, the Contractor shall, upon instructions from and to the satisfaction of the Contract Administrator, either replace or repair such damage, whichever may be deemed necessary in the opinion of and acceptable to, the Contract Administrator and the cost of which shall be borne entirely by the Contractor.
- E5.2 The Contractor shall also indemnify and save harmless the City from all claims made directly against it in respect to any such damage.
- E5.3 Any damage caused by the negligence of the Contractor or Subcontractors to the adjacent Works or properties, shall be promptly repaired by the Contractor at his/her own expense, to the satisfaction of the Contract Administrator.

E6. PROTECTION OF EXISTING TREES AND SHRUBS

- E6.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing trees and shrubs within the limits of the construction area.
- E6.2 The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 m of trees or shrubs.
- E6.3 Trees or shrubs identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400 mm wood planks, or suitably protected as approved by the Contract Administrator.
- E6.4 Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of one and a half (1.5) times the diameter (measured in inches), with the outcome read in feet, from the closest edge of the trunk. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.
- E6.5 Operation of equipment within the dripline of the trees and shrubs shall be kept to the minimum required to perform the Work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees and shrubs. The dripline of a tree or shrub shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees or shrubs are located.
- E6.6 Work on-site shall be carried out in such a manner so as to minimize damage to existing tree and shrub branches. Where damage to branches does occur, they shall be neatly pruned.

E6.7 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his/her designate.

E6.8 No separate measurement or payment will be made for the protection of trees.

E6.9 Except as required in clause E6.4 and E6.6, Elm trees shall not be pruned at any time between April 1 and July 31.

E7. ENVIRONMENTAL PLANNING

E7.1 The Contractor shall conduct his/her operations in accordance with all current federal, provincial, or other regulations concerning environmental protection and pollution control. It shall be the Contractor's responsibility to familiarize her or himself with all applicable regulations and to obtain all necessary approvals and permits for his/her operations.

E8. CLEAN UP

E8.1 The Contractor shall maintain the Sites of the Work in a tidy condition and free from the accumulation of waste and debris.

E8.2 Total Performance of the Work shall not be attained until the Contractor has cleaned up the Site and has removed all plant, tools, equipment, waste, and debris to the satisfaction of the Contract Administrator.

E9. TRAFFIC MANAGEMENT

E9.1 Further to clauses 3.6 and 3.7 of CW 1130-R3:

- (a) In accordance with the Manual of Temporary Traffic Control on City Streets (2015 edition), the Contractor ("Agency" in the manual) shall place all necessary temporary regulatory signs. The Contractor shall bear all costs associated with the placement of temporary regulatory signs.

E9.2 Further to clause 3.7 of CW 1130-R3:

E9.2.1 The following shall apply for Work carried out at S654 Bishop Grandin Blvd. WB, 2nd Structure East of Pembina Hwy.:

- (a) for the purpose of miscellaneous site work not including removal or installation of overhead sign structures, single lane closures are permitted;
- (b) multiple lane closures, meaning the simultaneous closure of more than one (1) lane, shall be permitted as described herein, for the purpose of removal and reinstallation of overhead sign structures;
- (c) multiple lane closures will not be permitted:
 - (i) 6:00 am to 8:00 pm Monday through Saturday; and
 - (ii) 12:00 noon to 8:00 pm Sunday.Unless otherwise approved by the Contract Administrator.
- (d) complete lane closures, for the purposes of removing or reinstalling the existing bridge-type steel overhead sign support structure shall be limited to a maximum of ten (10) minutes;
- (e) except as described in E9.2.1(d), at all times the Contractor shall limit multiple lane closures to the two (2) southern westbound Bishop Grandin Boulevard off-ramp lanes;
- (f) the Contractor may use these lanes to store materials and equipment only when Work is occurring at that location;

- (g) it is anticipated that various events held at the Investors Group Stadium, or other significant civic events may occur during the duration of the Contract. The Contract Administrator may at any time prohibit lane closures to accommodate such events;
- (h) the Contractor shall call the Lane Closures reporting line at (204) 986-5640 and the Traffic Management Branch at (204) 986-5079 at least one (1) day prior to beginning Work on any particular street;
- (i) intersecting street and private approach access shall be maintained at all times;
- (j) should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he/she shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of twenty-four (24) hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access;
- (k) pedestrian and ambulance/emergency vehicle access must be maintained at all times;
- (l) flagperson(s) shall be used to affect temporary lane closures during the lifting of structures over open lanes. Flagperson(s) shall meet all applicable Manitoba Workplace Safety and Health regulations;
- (m) if the Contractor determines that they are unable to meet the traffic management requirements described herein for any location, they may apply in writing to the Contract Administrator to determine an alternate schedule or closure;
- (n) all traffic control shall be implemented in accordance with the City of Winnipeg's Manual of Temporary Traffic Control on City Streets (2015 edition).

E9.2.2

The following shall apply for Work carried out at S640 Vaughan Street Southbound North of Portage Avenue.

- (a) diamond lane closure will not be permitted:
 - (i) Monday through Friday.
Unless otherwise approved by the Contract Administrator.
- (b) a single occurrence diamond lane closure, for the purpose of removing the existing cantilever type steel overhead sign support structure, refurbishing the concrete foundation, and erecting the new cantilever type steel overhead sign support structure shall be limited to a maximum of four (4) hours;
- (c) it is anticipated that various events held at the MTS Centre, or other significant civic events may occur during the duration of the Contract. The Contract Administrator may at any time prohibit lane closures to accommodate such events;
- (d) the Contractor shall call the Lane Closures reporting line at (204) 986-5640 and the Traffic Management Branch at (204) 986-5079 at least one day prior to beginning Work on any particular street;
- (e) intersecting street and private approach access shall be maintained at all times.
- (f) should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he/she shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of twenty-four (24) hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access;
- (g) pedestrian and ambulance/emergency vehicle access must be maintained at all times;
- (h) flagperson(s) shall be used to affect temporary lane closures during the lifting of structures over open lanes. Flagperson(s) shall meet all applicable Manitoba Workplace Safety and Health regulations;

- (i) if the Contractor determines that they are unable to meet the traffic management requirements described herein for any location, they may apply in writing to the Contract Administrator to determine an alternate schedule or closure;
- (j) all traffic control shall be implemented in accordance with the City of Winnipeg's Manual of Temporary Traffic Control on City Streets (2015 edition).

E9.2.3 Submittals

- (a) For the S654 sign structure location, **Appendix A – Traffic Control Plan** of this Bid Opportunity provides the general traffic management concept to be implemented by the Contractor. Modifications to the proposed traffic management scheme may be made in writing and shown as part of the detailed traffic management plans to be submitted, as described herein.
- (b) The Contractor shall submit detailed traffic management plans for each overhead sign structure location for review a minimum of fourteen (14) days prior to implementing the lane closure(s) or performing any work.
- (c) The detailed traffic management plans shall be prepared in accordance with the City of Winnipeg's Manual of Temporary Traffic Control on City Streets (2015 edition).
- (d) The detailed traffic management plans shall:
 - (i) show a plan view of the area for each stage of construction or traffic control setup;
 - (ii) show all applicable signage and traffic management devices to be used;
 - (iii) provide all relevant dimensions and geometric layout of devices such as sign spacing, taper lengths, cone spacing, etc.;
 - (iv) indicate the general sequence of device installation;
 - (v) indicate the date and time of implementation of the devices;
 - (vi) indicate the expected date and time of the removal of the devices;
 - (vii) confirm the work zones created by the closures are adequate for the operation of cranes, and other construction operations required for the work; and
 - (viii) all other information as deemed necessary by the Contract Administrator and/or other agencies reviewing the submitted traffic management plans.

E9.3 Measurement and Payment

- (a) Provision of traffic management at the S654 site shall be incidental to the respective unit price for "Refurbishment of Existing Steel Overhead Sign Support Structures". No measurement and no separate payment will be made for the provision of traffic management in accordance with this Specification and accepted by the Contract Administrator.
- (b) Provision of traffic management at the S640 site shall be incidental to the respective unit price for "Supply and Installation of New Steel Overhead Sign Support Structures". No measurement and no separate payment will be made for the provision of traffic management in accordance with this Specification and accepted by the Contract Administrator.

E10. PEDESTRIAN SAFETY

E10.1 The Contractor shall provide signage at the nearest upstream and downstream sidewalk intersections indicating sidewalk closure at any time pedestrians are unable to traverse the sidewalk safely, including during the removal of existing structures, erection of new structures, and other miscellaneous works leaving less than 1.0 m clear width of sidewalk. No payment shall be made for this work.

E10.2 In no circumstance shall pedestrians be permitted to use the street to travel around the construction Site.

E11. LAYOUT OF THE WORK

- E11.1 The Contractor shall be responsible for the true and proper laying out of the Work and for the correctness of the location, levels, dimensions, and alignment of all aspects of the Work. He/she shall provide all required instruments and competent personnel for performing all layouts.
- E11.2 The Contract Administrator shall be notified at least one (1) Working Day prior to any Work being commenced in order to have the option to check and review all elevations and layouts at his/her discretion.
- E11.3 The Contractor shall carefully protect and preserve all benchmarks, pins, stakes, and other items of the basic data supplied by the Contract Administrator. Any such benchmarks, pins, or stakes removed or destroyed by the Contractor, without the consent of the Contract Administrator, shall be replaced by the Contract Administrator at the expense of the Contractor.

E12. SEQUENCE OF WORK

- E12.1 The intent of this Section is to specify the sequence that tasks shall be performed. The tasks described in this section are not a complete description of the Contractor's duties.
- E12.2 The Contractor shall observe the following sequence of Work for each structure:
- (a) Structure S654 – Bishop Grandin Blvd. WB, 2nd Structure East of Pembina Hwy.
 - (i) the City of Winnipeg will de-energize the structure, if required;
 - (ii) the City of Winnipeg will set up temporary signage if required;
 - (iii) the Contractor shall remove and deliver the existing sign panels;
 - (iv) the Contractor shall remove and refurbish the existing structure and mounting brackets;
 - (v) the Contractor shall refurbish the existing concrete foundations;
 - (vi) the Contractor shall install the refurbished structure and new sign panels (supplied by others) using the refurbished mounting brackets.
 - (b) Structure S640 – Vaughan Street Southbound North of Portage Avenue:
 - (i) the Contractor shall fabricate the new TLS-088 structure;
 - (ii) the City of Winnipeg will de-energize the S640 structure, if required;
 - (iii) the City of Winnipeg will set up temporary signage, if required;
 - (iv) the Contractor shall remove and deliver the existing sign plate;
 - (v) the Contractor shall remove and dispose of the existing S640 structure;
 - (vi) the Contractor shall refurbish the existing concrete foundation;
 - (vii) the Contractor shall install the new TLS-088 structure;
 - (viii) the City of Winnipeg will install the sign plate.

E13. SURFACE RESTORATIONS

- E13.1 Further to clause 3.3 of CW 1130-R3, when Total Performance is not achieved in the year the Contract is commenced, the Contractor shall temporarily repair any Work commenced and not completed to the satisfaction of the Contract Administrator. The Contractor shall maintain the temporary repairs in a safe condition as determined by the Contract Administrator until permanent repairs are completed. The Contractor shall bear all costs associated with temporary repairs and their maintenance.

E14. WORKING NEAR OVERHEAD LINES

E14.1 Description

E14.1.1 The Work covered under this item shall include all operations related to working near overhead lines in accordance with this Specification and as shown on the Drawings.

E14.1.2 The Work to be done by the Contractor under this Specification shall include the supply of all materials and the furnishing of all superintendence, overhead, labour, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E14.1.3 For the purposes of this Specification, a distinction between *Transmission Lines* and *Distribution Lines* is made as follows:

- (a) *Transmission Line* refers to generally large tower supported high voltage lines intended for the transmission of electricity over long distances.
- (b) *Distribution Line* refers to smaller local regular voltage lines intended for the local distribution of electricity. These are typically supported on wood poles.

E14.2 General

E14.2.1 This specification shall apply to the following sites which are considered to have overhead lines nearby. The locations are:

- (a) S654 Bishop Grandin Blvd. WB, 2nd Structure East of Pembina Hwy. A single Manitoba Hydro transmission line is present at this site, crossing above the southern end of the overhead sign structure. The transmission line is lattice tower supported in the vicinity of the site, supporting a total of seven wires. Additionally, a single Manitoba Hydro distribution line crosses above the northern end of the overhead sign structure. The distribution line is wood pole supported in the vicinity of the site, supporting a total of four (4) wires. The lower wire is in close proximity to the right-most sign panel.
- (b) Manitoba Hydro contacts are as follows:
 - (i) for inquiries related to Transmission Lines:
Bob Latka
Phone: 204-981-7232
 - (ii) for inquiries related to Distribution Lines:
Dean Pattison, Assistant District Supervisor
Phone: 204-360-5746
Email: depattison@hydro.mb.ca

E14.3 Pre-Construction Meeting

- (a) The Contractor shall arrange a site meeting for site S654 with the following agencies:
 - (i) General Contractor;
 - (ii) Subcontractor that may be involved in the work, such as crane operators, etc.;
 - (iii) Contract Administrator or designated representative;
 - (iv) Manitoba Hydro Transmission Department designated representative; and
 - (v) Manitoba Hydro Fort Gary District designated representative.
- (b) At the site meeting, the Contractor shall present the proposed construction methods (i.e. craning, type of lifting devices, use of manlifts, safety procedures, sequence of operations etc.).

E14.4 Agency Requirements

- (a) The Contractor shall carry out all operations in accordance with Manitoba Workplace Safety and Health Act and Regulations. Part 25 *Work in the Vicinity of Overhead Electrical Lines* is especially applicable to the Work. In the event of a discrepancy between this specification and any Manitoba Workplace Safety and Health Act or Regulation, the requirements of the Act and Regulations shall govern.
- (b) The Contractor shall carry out all operations in accordance with Manitoba Hydro requirements.
- (c) The expected Manitoba Hydro requirements are as follows; however, these may be subject to change based on the pre-construction meeting:
 - (i) provision of a Safety Watch by Manitoba Hydro (Transmission Branch) may be required for site S654;
 - (ii) maintain minimum fifteen (15) feet clearance to any transmission line;
 - (iii) provision of a Manitoba Hydro Safety Watch may reduce the transmission line clearance to ten (10) feet; however, this is to be confirmed by Manitoba Hydro at their discretion;
 - (iv) transmission lines will not be de-energized at any time during the Project;
 - (v) transmission lines shall not be sleeved;
 - (vi) provision of a Safety Watch by Manitoba Hydro (Fort Gary District) may be required for site S654 distribution lines;
 - (vii) distribution lines may be sleeved at the discretion of Manitoba Hydro to facilitate the Work.
- (d) The Contractor shall confirm all Manitoba Hydro requirements at the Pre-Construction Meeting.
- (e) The Contractor shall bear all costs associated with work near overhead lines, including but not limited to: coordination of the work; provision of appropriate equipment (such as lifting devices) to perform the work; provision of Safety Watches; payment for Safety Watch overtime where applicable; and any other work, materials, superintendence, labour, agency fees, or any other costs associated with the work.

E14.5 Responsibility for Damages

- (a) The Contractor shall be responsible for any damage and for any claims due to loss of service caused by construction operations. No additional compensation will be paid to the Contractor for any inconvenience or additional expense incurred as a result of the existing overhead lines at the site, as this will be considered incidental to the Work.

E14.6 Measurement and Payment

- (a) Working near overhead lines at site S654 shall be incidental to the respective unit price for "Refurbishment of Existing Steel Overhead Sign Support Structures". No measurement and no separate payment will be made for working near overhead lines in accordance with this Specification and accepted by the Contract Administrator.

E15. REFURBISHMENT OF EXISTING CONCRETE FOUNDATIONS

E15.1 Description

- E15.1.1 The Work covered under this item shall include all operations related to the refurbishment of existing concrete foundations in accordance with this Specification and as shown on the Drawings.
- E15.1.2 The Work to be done by the Contractor under this Specification shall include the supply of all materials and the furnishing of all superintendence, overhead, labour, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E15.2 Materials

E15.2.1 General

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

E15.2.2 Handling and Storage of Materials

- (a) All materials shall be handled and stored in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

E15.2.3 Cold Applied Galvanizing Compound

- (a) Approved cold applied galvanizing compound is as follows:
 - (i) ZINGA, as manufactured by ZINGAMETALL, Ghent, Belgium, available from Pacific Evergreen Industries Ltd. Vancouver, BC, Ph. (604) 926-5564, and Centennial Mine & Industrial Supply, Saskatoon, Sask., Ph. (306) 975-1944.

E15.2.4 Concrete Corrosion Inhibitor Protection System

- (a) Concrete corrosion inhibitor protection system for exposed surface of existing concrete foundations shall be MCI 2020 by Cortec Corporation, or equal as approved by the Contract Administrator.

E15.2.5 Joint Sealant

- (a) Joint Sealant for sealing around existing piles shall be an elastomeric polyurethane sealant such as Sonolastic® NP 1™ as manufactured by BASF, or equivalent as approved by the Contract Administrator.

E15.3 Construction Methods

E15.3.1 General

- (a) Refurbishment of existing concrete foundations shall be carried out where indicated on the Drawings. The refurbishment work shall be carried out while the sign support structure is removed from the foundation being refurbished.
- (b) Concrete foundation refurbishment work consists of two parts: cleaning and coating the existing anchor bolts, and cleaning and applying a corrosion inhibitor to the concrete surface.

E15.3.2 Cleaning and Coating Existing Anchor Bolts

- (a) Lightly clean the existing anchor bolts by sandblasting, taking care not to damage the threads.
- (b) Immediately after cleaning, brush away all excess grit and apply three complete coats of the approved cold applied galvanizing compound. Allow the compound to fully dry after each coat for the duration recommended by the product manufacturer.
- (c) A wax based lubricant shall be applied to the bolts prior to installation of the nuts and washers.

E15.3.3 Application of Corrosion Inhibitor

- (a) Clean the surface of the existing concrete by sandblasting. All exposed concrete surfaces shall be cleaned free of dust and blasting grit.
- (b) Apply the concrete corrosion inhibitor in accordance with the manufacturer's instructions.

E15.3.4 Installation of Joint Sealant

- (a) Where indicated on the Plans, install joint sealant around concrete piles between the pile and adjacent concrete surfaces.
- (b) Prepare joint and install sealant in accordance with the manufacturer's recommendations.

E15.4 Measurement and Payment

E15.4.1 Refurbishment of Existing Concrete Foundations

- (a) Refurbishment of existing concrete foundations will be measured on a unit basis per concrete foundation refurbished and will be paid for at the Contract Unit Price for "Refurbishment of Existing Concrete Foundations" for existing concrete foundations refurbished in accordance with this Specification and accepted by the Contract Administrator.

E16. REFURBISHMENT OF EXISTING STEEL OVERHEAD SIGN SUPPORT STRUCTURES

E16.1 Description

E16.1.1 The Work covered under this item shall include all operations related to the refurbishment of existing steel overhead sign support structures in accordance with this Specification and as shown on the Drawings.

E16.1.2 The Work to be done by the Contractor under this Specification shall include the supply of all materials and the furnishing of all superintendence, overhead, labour, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E16.2 Materials

E16.2.1 General

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

E16.2.2 Handling and Storage of Materials

- (a) All materials shall be handled and stored in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

E16.2.3 Miscellaneous Structural Steel

- (a) Miscellaneous structural steel shall be in accordance with CSA G40.21 Grade 300W.

E16.2.4 Flange Bolts, Nuts, and Washers

- (a) All sign support structures being refurbished shall be provided with new connection bolts, nuts, and washers in accordance with ASTM A325 Type 1, hot-dip galvanized.

E16.2.5 Anchor Bolt Nuts and Washers

- (a) All sign support structures being refurbished shall be provided with two (2) new anchor bolt nuts and two (2) new washers per anchor bolt.
- (b) Nuts shall be in accordance with ASTM A563, Grade DH, Heavy Hex.
- (c) Washers shall be in accordance with ASTM F436, Type 1.
- (d) Nuts and washers shall be hot-dip galvanized in accordance with ASTM F2329.

E16.2.6 Mounting Bracket Fasteners (Bracket-to-Bracket)

- (a) Mounting bracket fasteners (connecting two-clamp brackets) shall be all-thread rod conforming to one of the following:
 - (i) SAE Grade 2 hot dip galvanized;
 - (ii) ASTM A307 Grade B hot dip galvanized;
 - (iii) ASTM F1554 Grade 55 hot dip galvanized.
- (b) Hot-dip galvanizing shall be in accordance with ASTM F2329. Plated coatings will not be accepted.
- (c) Two (2) nuts, two (2) washers and one (1) lock washer (all hot dip galvanized) shall be provided for each segment of threaded rod.

- (d) The Contractor is permitted to field cut the threaded rod to suit the required length. If so, apply Zinga zinc rich galvanizing touch up paint to cut ends.

E16.2.7 Mounting Bracket Fasteners (Bracket to Panel)

- (a) Mounting bracket fasteners connecting the bracket to the aluminum backing bars of the sign panel shall be stainless steel all-thread hex bolts conforming to ASTM F593 grade 304 or 316.
- (b) One (1) nut, one (1) washer, and one (1) lock washer shall be furnished with each bolt.

E16.2.8 Handhole Covers and Hardware

- (a) New handhole covers and backing bars, if required, shall be steel in accordance with CSA G40.21 300W.
- (b) Hardware and fasteners for handhole covers shall be in accordance with ASTM A276 Type 316 stainless steel.

E16.2.9 Hot-Dip Galvanizing

- (a) Hot-dip galvanizing shall be in accordance with ASTM A123 for a minimum net retention of 610 g/m².

E16.2.10 Structural Steel

- (a) Structural steel for all components of the overhead sign support structures shall be in accordance with CSA Standard G40.21 M, to the grades indicated on the Drawings. For purposes of hot-dip galvanizing, the silicon content in the steel shall be controlled within zero to three hundredths of a percent (0 to 0.03%) or fifteen hundredths to twenty-two hundredths of a percent (0.15 to 0.22%) for monotubular shafts and arms, and to less than three tenths of a percent (0.3%) for all other steel components.
- (b) The Contractor is advised that copies of mill test certificates showing the chemical and physical properties of all structural steel to be supplied under this Specification must be supplied to the Contract Administrator and be found acceptable prior to commencement of fabrication.
- (c) Steel shall not be acceptable unless the mill test certificate states the grade to be as indicated on the Drawings. Lower grade steel shall not be acceptable (despite favourable published mill test results). Items fabricated without steel certification shall be rejected.

E16.2.11 Welding Consumables

- (a) Welding consumables for all processes shall be certified by the manufacturer to be complying with the requirements of CSA Standard W59-M1984 and the following Specifications:
 - (i) manual shielded metal arc welding (SMAW): All electrodes shall be basic-type electrodes conforming to CSA W48.1-M1991 or W48.3-M1982, classification E480XX, or imperial equivalent;
 - (ii) gas metal arc welding (GMAW): All electrodes shall conform to CSA W48.4-M1980, classification ER480S-X, or imperial equivalent;
 - (iii) flux cored arc welding (FCAW): All electrodes shall conform to CSA W48.5-M1982, classification E480XT-X or imperial equivalent. Electrodes shall be controlled by hydrogen (CH) designation;
 - (iv) submerged arc welding (SAW): All electrodes shall conform to CSA W48.6-M1980, classification F480X-EXXX or imperial equivalent;
 - (v) shielding gas shall be welding grade carbon-dioxide with a guaranteed dew point of -46°C; and
 - (vi) all electrodes, wires, and fluxes used shall be of a classification requiring a minimum impact of 27 joules at -18°C.

- (b) The proposed welding procedures and welding consumable certificates shall be submitted to the Contract Administrator for his/her approval at least two (2) Calendar Days prior to the scheduled commencement of any fabrication.

E16.2.12 Non-Shrink Grout

- (a) Grout as specified hereinafter shall be used for the construction of grout pads under sign structure base plates. Grout shall consist of a pre-mixed, non-metallic non-shrink grout. Approved products are:
 - (i) M-Bed Standard grout by Sternson Ltd.;
 - (ii) CPD Non-shrink grout by Master Builders;
 - (iii) set Non-shrink grout by Master Builders;
 - (iv) Sikadur VPC grout by Sika Canada Inc. for cold weather construction (0 °C to -20 °C).
- (b) The grout shall be of a consistency suitable for the application intended, as approved by the Contract Administrator.

E16.3 Equipment

- E16.3.1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order.

E16.4 Construction Methods

E16.4.1 Refurbishment Works

- (a) The refurbishment of existing steel overhead sign support structures includes the following works. The Contractor should include the cost of all items required for the refurbishment in the total unit price for each structure per Site as no separate payment will be made for individual items:
 - (i) removal of existing steel overhead sign support structures, including removal of sign panels and electrical appurtenances. All components shall be properly labelled and numbered;
 - (ii) transportation of sign structures to the Contractor's fabrication shop;
 - (iii) disposal of electrical appurtenances;
 - (iv) delivery of the existing sign panels to the City of Winnipeg Traffic Services located at 421 Osborne Street, and/or storage as indicated on the Drawings;
 - (v) surface preparation and cleaning of sign structures and mounting brackets.
 - (vi) detailed inspection of the structure by the Contract Administrator to identify structural repairs and/or defective welds;
 - (vii) complete repair of defective welds as directed by the Contract Administrator;
 - (viii) complete structural modification and/or strengthening works as shown on the Drawings;
 - (ix) provision of a sign structure identification number if none present;
 - (x) provision of bracket identification numbers if none present;
 - (xi) all sign structures taken to the shop shall be provided with new hot-dip galvanized handhole covers complete with stainless steel fasteners;
 - (xii) hot-dip galvanizing of sign structures and mounting brackets;
 - (xiii) reinstallation of refurbished sign structures complete with new fasteners and reinstallation of sign panels using refurbished brackets and new fasteners; and
 - (xiv) construction of new grout pads under sign structure bases.

E16.4.2 Additional Repair Work or Miscellaneous Works

- (a) In addition to Works included in the full refurbishment of all sign structures, the following repair Work or miscellaneous works shall be carried out for designated sign structures as indicated on the Drawings and as directed by the Contract Administrator in writing during the construction:

- (i) repair of defective welds.

E16.4.3 Removal of Sign Support Structures

- (a) The Contractor shall submit a Removal Procedure Plan for each structure to be removed, including details of traffic control, to the Contract Administrator for review and approval. The Removal Procedure Plan shall be submitted at least twenty-one (21) days prior to removing the overhead sign structure to arrange for installation of temporary signs and de-energizing the power supply as well as review/approval by City of Winnipeg Traffic Management Engineer.
- (b) The Contractor shall never lift an overhead sign structure or member over traffic.
- (c) The City of Winnipeg Traffic Services Branch will supply and install temporary sign posts as required. The power supply to the existing overhead sign support structures designated for refurbishment will be de-energized by the City of Winnipeg Traffic Signals Branch.
- (d) The Contractor shall use a digital multi-meter to verify that the electrical power supply to the structure has been de-energized prior to removal of the structure.
- (e) Prior to dismantling a sign structure, the Contractor shall identify to the Contract Administrator any damaged or missing components and hardware or any other discrepancies and damage not indicated on the Drawings.
- (f) The Contractor shall remove the existing sign support structures carefully without damaging the existing anchor bolts and adjacent property. The horizontal and vertical support members shall be dismantled and placed on timber blocking and transported to the shop. All existing wiring within the members shall be removed.
- (g) Prior to removing the sign mounting brackets from the horizontal support member, the Contractor shall carefully measure and record the location of each sign mounting bracket and mark each sign mounting bracket with a unique identifier.
- (h) Deliver the existing sign panels to the City of Winnipeg Traffic Services, 421 Osborne Street, or store panels, as indicated on the Drawings.
- (i) Removal of sign support structures and related works shall be considered incidental to "Refurbishment of Existing Steel Overhead Sign Support Structures" and no separate payment will be made.

E16.4.4 Surface Preparation and Cleaning

- (a) Surface preparation and cleaning of materials prior to hot-dip galvanizing shall be in accordance with ASTM A123 and SSPC Specification SP:6, "Commercial Blast Cleaning," unless otherwise specified herein. The Contractor shall ensure that all exterior and interior surfaces of vertical support members of sign structures are blast cleaned prior to pickling to achieve the minimum zinc coating mass of 610 g/m². All welding and provision of holes is to be completed prior to surface preparation and cleaning, except where shown on the Drawings.
- (b) The sandblasting and cleaning of sign structures shall be done in the shop.
- (c) After the structures have been sandblasted they shall be thoroughly cleaned of all sandblasting abrasive grit and debris, with special attention paid to areas of the structure where sand and debris collect, including but not limited to behind the gusset plates, handholes, and base plate.
- (d) After the sign structures have been sandblasted and cleaned, the Contract Administrator will carry out a visual inspection of the structures in the shop before they are shipped to the galvanizing plant.
- (e) Surface preparation and cleaning of refurbished sign support structures and mounting brackets shall be considered incidental to "Refurbishment of Existing Steel Overhead Sign Support Structures" and no separate payment will be made.

E16.4.5 Fabrication and Structural Modifications

- (a) All fabrication shall be carried out in accordance with this Specification and the Drawings, as well as AASHTO Standard Specifications for Structural Supports for Highway, Signs, Luminaries, and Traffic Signals - 2009 - 5th Edition, plus all subsequent revisions.
- (b) The punching of identification marks on the members will not be allowed, except for the structure identification number.
- (c) Any damage to members during fabrication shall be drawn to the attention of the Contract Administrator in order that the Contract Administrator may approve remedial measures.
- (d) Dimensions and fabrication details that control the field matching of parts shall receive very careful attention in order to avoid field adjustment.
- (e) All portions of the Work shall be neatly finished. Shearing, cutting, clipping, and machining shall be done neatly and accurately. Finished members shall be true to line, free from twists, bends, sharp corners, and edges.
- (f) Cut edges shall be true and smooth and free from excessive burrs or ragged breaks. Re-entrant cuts shall be avoided wherever possible. If used, they shall be filleted by drilling prior to cutting.
- (g) All holes shall be free of burrs and rough edges.

E16.4.6 Welding

- (a) Welding of steel structures shall be in accordance with CSA W59, "Welded Steel Construction."
- (b) All seams shall be continuously welded and free from any slag and splatter. Longitudinal welds shall be a minimum of sixty percent (60%) penetration, except those within 200 mm of baseplates, flanges, and circumferential welds, which shall be one hundred percent (100%) penetration. All circumferential groove welds shall be one hundred percent (100%) penetration, and where circumferential welds are used at a butt joint, an internal backup strip shall be provided.
- (c) Longitudinal seam welds in horizontal supports shall be located at the top of the horizontal members.
- (d) All welds shall be ground smooth and flush with the adjacent surface prior to hot-dip galvanizing.

E16.4.7 Repair of Defective Welds

- (a) All existing welds shall be visually inspected by the Contract Administrator following surface preparation and cleaning.
- (b) Defective welds, as revealed by shop inspections, shall be corrected by removing and replacing the weld to the extent directed by the Contract Administrator. The defective welds shall be removed by chipping or machining. Oxygen cutting shall not be used to remove welds. Before rewelding, the joint shall be inspected by the Contract Administrator to assure that all of the defective welds have been removed. The new welds shall be sized to match existing.
- (c) Superficial weld defects at non-critical locations may be repaired by grinding or beading the weld as required and as approved by the Contract Administrator.
- (d) Repair of defective welds shall be considered incidental to "Refurbishment of Existing Steel Overhead Sign Support Structures" with no additional payment except for those welds within 200 mm of base plates, flange connections, and circumferential butt welds for which payment will be made.
- (e) New welds for the purposes of structural modifications or strengthening as indicated on the Drawings are not considered repair of defective welds and no additional payment will be made.

E16.4.8 Sealing over Drilled Holes

- (a) Drilled holes (for electrical connections, etc.) present in the shafts shall be repaired by fabricating a 6 mm thick cover plate and seal welding all around the perimeter of the cover plate.
- (b) Covering drilled holes with seal welded cover plates shall be considered incidental to "Refurbishment of Existing Steel Overhead Sign Support Structures" and no additional payment will be made.

E16.4.9 Sign Structure Identification Number

- (a) Each sign structure shall be provided with a "raised" structure identification number with a welding electrode in accordance with the details shown on the Drawings and as directed by the Contract Administrator. The sign structure identification number shall be placed before hot-dip galvanizing.
- (b) Provision of the sign structure identification number shall be considered incidental to "Refurbishment of Existing Steel Overhead Sign Support Structures" and no separate payment will be made.

E16.4.10 Mounting Bracket Identification Marks

- (a) Each mounting bracket shall be provided with a unique "raised" identification number with a welding electrode in accordance with the details shown on the Drawings and as directed by the Contract Administrator. The sign structure identification number shall be placed before hot-dip galvanizing.
- (b) Provision of the mounting bracket identification number shall be considered incidental to "Refurbishment of Existing Steel Overhead Sign Support Structures" and no separate payment will be made.

E16.4.11 Handhole Covers and Hardware

- (a) All sign structures being refurbished shall be provided with new hot-dip galvanized handhole covers, complete with stainless steel hardware.
- (b) Provision of the handhole covers and hardware shall be considered incidental to "Refurbishment of Existing Steel Overhead Sign Support Structures" and no separate payment will be made.

E16.4.12 Hot-Dip Galvanizing

- (a) The hot-dip galvanizing plant shall be a Regular Member of the American Galvanizers Association, Inc.
- (b) All outside surfaces of the overhead sign support structures shall be hot-dip galvanized in accordance with ASTM A123 to a minimum net retention of 610 g/m².
- (c) Adequate venting and drainage holes shall be provided in enclosed sections for hot-dip galvanizing. The galvanizing facility shall be consulted regarding the size and location of these holes. Holes shall be provided by drilling not burning.
- (d) The galvanizing coating on outside surfaces of overhead sign support structures shall be generally smooth and free of blisters, lumpiness, and runs. In particular, the outside surfaces of the bottom 2.5 m of the vertical support members shall have a smooth finish equal to the finish on hot-dipped galvanized handrails.
- (e) In addition to the provision of corrosion protection by the galvanized coating, the aesthetic appearance of the structure after hot-dip galvanizing will also be a criterion in the acceptance or rejection of the galvanized coating. The galvanized coating on the entire structure shall have a uniform "silver" colour and lustre. Galvanizing with parts of the structure having dull grey coating or streaks or mottled appearance will not be acceptable. If the galvanizing is rejected for aesthetic reasons, the Contractor shall rectify the appearance by applying spray-on molten zinc metallizing with 85/15 zinc/aluminum alloy. The metallizing shall be carried out in the shop before the structure is installed.

- (f) Minor defects in the galvanizing coating shall be repaired as specified here below for "Field-Applied Touch-Up Galvanizing". The Contract Administrator shall be consulted before repairs are made.
- (g) Other defects and contaminants in the galvanizing coating, such as heavy dross protrusions, flux inclusions and ash inclusions shall be grounds for rejection of the galvanizing coating system.
- (h) The Contractor shall verify the thickness of galvanized coatings as part of their own quality control testing and make their results available to the Contract Administrator.
- (i) All threaded couplings shall be rethreaded after the sign structures have been hot-dip galvanized.
- (j) The sign structures shall be stored on timber blocking after hot-dip galvanizing.
- (k) Hot-dip galvanizing of refurbished sign support structures and mounting brackets shall be considered incidental to "Refurbishment of Existing Steel Overhead Sign Support Structures" and no separate payment will be made.

E16.4.13 Delivery and Erection

- (a) The Contractor shall notify the Contract Administrator at least two (2) Working Days in advance of the anticipated delivery to the Site and erection of the overhead sign support structures.
- (b) The sign structures shall be lifted and secured with nylon ropes or other approved methods. Use of steel chains and steel hooks against hot-dip galvanized or powder coated surfaces will not be permitted. The structure components (shaft and arm etc.) shall be placed on timber blocking and secured with nylon ropes during their transportation to the Site.
- (c) Unused threaded couplers shall be fitted with galvanized threaded plugs.

E16.4.14 Attachment of Structure to Anchor Bolts

- (a) Each anchor bolt shall be provided with two (2) galvanized nuts: one (1) nut below the base plate for levelling the structure, and one (1) nut above the base plate for anchoring the structure. The anchor bolts shall have a minimum projection of 25 mm above the anchoring nuts. There shall be provision for maximum 50 mm thick grout pad under the base plate.
- (b) The threaded portions of the anchor bolts and nuts shall be treated with a wax based lubricant.
- (c) The Contractor shall plumb the shaft by adjusting the levelling and anchor nuts.
- (d) Levelling nuts and anchor nuts shall be tightened to a snug tight condition, defined as the full effort of an ironworker using an ordinary wrench, or a few impacts of an impact wrench.
- (e) The Contractor shall tighten the top anchoring nuts in an alternating "star" type pattern as follows:
 - (i) for anchor bolts less than or equal to 38 mm diameter: 1/3 of a turn (+20°, -0°) past a snug tight condition;
 - (ii) for anchor bolts greater than 38 mm diameter: 1/6 of a turn (+20°, -0°) past a snug tight condition.

E16.4.15 Structural Bolt Installation

- (a) Structural bolts for flange and splice connections shall be tightened in accordance with the turn-of-nut method as follows:
 - (i) alternately tighten all bolts to achieve a snug tight condition. The mating surfaces shall be in firm contact;
 - (ii) tighten all bolts in accordance with Table 1;
 - (iii) following tightening, check all bolts in the joint by hand using an ordinary wrench.

Table 1: Required Turns Past Snug Tight for Turn-of-Nut Method

Bolt Diameter D (inches)	Bolt Length up to 4D		Bolt Length over 4D to 8D		Bolt Length over 8D to 12D	
	Length up to	Required Turns	Length Range	Required Turns	Length Range	Required Turns
1/2"	2"	1/3 ± 30°	2 to 4"	1/2 ± 30°	4 to 6"	2/3 ± 45°
5/8"	2.5"	1/3 ± 30°	2.5 to 5"	1/2 ± 30°	5 to 7.5"	2/3 ± 45°
3/4"	3"	1/3 ± 30°	3 to 6"	1/2 ± 30°	6 to 9"	2/3 ± 45°
7/8"	3.5"	1/3 ± 30°	3.5 to 7"	1/2 ± 30°	7 to 10.5"	2/3 ± 45°
1"	4"	1/3 ± 30°	4 to 8"	1/2 ± 30°	9 to 13.5"	2/3 ± 45°
1 1/8"	4.5"	1/3 ± 30°	4.5 to 9"	1/2 ± 30°	10 to 15"	2/3 ± 45°
1 1/4"	5"	1/3 ± 30°	5 to 10"	1/2 ± 30°	11 to 16.5"	2/3 ± 45°

E16.4.16 Delivery of Refurbished Mounting Brackets

- (a) The following items apply in cases where installation of the sign panels is performed by others:
 - (i) deliver mounting brackets to the City of Winnipeg Traffic Services Branch at 421 Osborne Street. Contact Mr. Wes Delaney (204) 986-5841 to arrange a suitable delivery time;
 - (ii) each mounting bracket shall be delivered complete with hardware and loosely assembled. Each bracket shall be clearly marked;
 - (iii) the Contractor shall prepare a record of shipping listing all items delivered, and shall be signed by the Contractor and the receiver upon delivery. The Contractor shall provide duly signed copies of the record of shipping to the receiver and the Contract Administrator;
 - (iv) upon delivery the Contractor shall load/unload the brackets and place them in a location as directed by a representative of the City of Winnipeg Traffic Services Branch;
 - (v) delivery of mounting brackets and all related works shall be considered incidental to "Refurbishment of Existing Steel Overhead Sign Support Structures" and no separate payment will be made.

E16.4.17 Installation of Sign Panels

- (a) The Contractor will be responsible for installation of sign panels, unless otherwise noted on the Drawings.
- (b) New sign panels will be supplied by the City of Winnipeg Traffic Services.
- (c) The Contractor shall pick up new sign panels from 421 Osborne Street. Loading, transportation, unloading and installation shall be the responsibility of the Contractor. Contact Mr. Wes Delaney (204) 986-5841 to arrange a suitable pickup time.
- (d) Aluminum backing bars will be pre-installed on the sign panel by the City of Winnipeg Traffic Services, adjustment of the backing bars may be required in the field to clear splice plates etc.
- (e) Holes in the aluminum backing bars shall be field marked and drilled to suit attachment to the mounting brackets. Holes shall be drilled so that the sign panel is level in its final position on the structure.
- (f) At the Contractor's option, sign panels may either be installed on the cross arm prior to erection of the arm, or they may be installed on the structure after it is erected. Traffic control for the purposes of sign panel installation shall be submitted to the Contract Administrator for approval prior to carrying out the Work.
- (g) Fastener installation shall be as directed by the Contract Administrator. All fasteners shall be new, supplied by the Contractor.

- (h) The Contractor shall take great care when handling existing or new sign panels. Any damage to the sign panels that has not been identified prior to removal will be repaired by Traffic Services. All costs and delays associated with the repair shall be borne by the Contractor.

E16.4.18 Grout Pads

- (a) New grout pads shall be constructed under sign structure bases after erection has been completed to the satisfaction of the Contract Administrator incidental to the Work of this item.
- (b) Grout pads shall extend to the edge of the concrete pile and provide positive drainage away from the base plate.

E16.4.19 Field-Applied Touch-up Galvanizing

- (a) Any areas of damaged galvanizing on the sign structures shall receive field-applied touch-up galvanizing.
- (b) Surfaces to receive touch-up galvanizing shall be cleaned using a wire brush, a light grinding action, or mild blasting to remove loose, scale, rust, paint, grease, dirt, or other contaminants.
- (c) Damaged areas less than 100 x 100 mm in extent shall be touched-up using zinc rich paint.
- (d) Damaged areas exceeding 100 x 100 mm in extent shall be repaired using arc-spray zinc metallizing, as directed by the Contract Administrator.
- (e) For cold applied galvanizing compound, the approved product shall be applied by either a brush or roller. The compound shall be applied in three (3) coats, with each coat having a dry film thickness of 60 µm (2.36 mils). Each coat shall be left to dry for a minimum of one (1) hour before the application of the next coat.

E16.5 Quality Control

E16.5.1 General

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

E16.5.2 Welding Qualifications

- (a) The Contractor shall produce evidence that the plant is currently certified to the requirements of CSA W47.1 Division 1 or Division 2 for welding of steel structures.
- (b) Approved welding procedures shall be submitted to the Contract Administrator prior to fabrication of any steel items.

E16.5.3 Testing

- (a) In addition to the Contractor's own quality control testing of all materials, welding procedures and steel fabrication including hot-dip galvanizing will be inspected and tested by the Contract Administrator to ascertain compliance with the Specifications and Drawings.

- (b) The Contract Administrator will hire a testing agency certified by the Canadian Welding Bureau to carry out shop fabrication inspection and testing before the overhead sign support structures are approved ready for installation of coating system. The inspector shall have access to all of the fabricator's normal quality control records for this Contract, specified herein. Inspection and testing will include:
 - (i) visual inspection of one hundred percent (100%) of welds;
 - (ii) ultrasonic testing of one hundred percent (100%) of full penetration sections of longitudinal seam welds and circumferential butt welds;
 - (iii) magnetic particle testing of a random ten percent (10%) of partial penetration sections of longitudinal seam welds;
 - (iv) ultrasonic testing of twenty-five percent (25%) of base plate and flange plate welds;
 - (v) visual inspection of blast cleaning surface preparation;
 - (vi) inspection of hot-dip galvanizing and coating thickness.
- (c) Welds that are found by any of the inspection and testing methods to be inadequate and unsatisfactory shall be repaired in accordance with CSA W59 and then retested. The cost of the repairs and the cost of the retest shall be paid for by the Contractor.
- (d) No repair shall be made until agreed to by the Contract Administrator.
- (e) Defects in hot-dip galvanizing shall be rectified as directed by the Contract Administrator.

E16.5.4 Unacceptable Work

- (a) Any Work found to be unacceptable shall be corrected in accordance with CSA W59.
- (b) No repair shall be made until agreed to by the Contract Administrator.

E16.6 Method of Measurement

E16.6.1 Refurbishment of Existing Steel Overhead Sign Support Structures

- (a) Refurbishment of existing steel overhead sign support structures will be measured on a lump sum basis per structure per site.

E16.6.2 Repair of Defective Welds

- (a) Repair of defective welds will be measured on a linear centimetre basis. The length to be paid for shall be the total number of centimetres of weld repairs in accordance with this Specification and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E16.7 Basis of Payment

E16.7.1 Refurbishment of Existing Steel Overhead Sign Support Structures

- (a) Refurbishment of existing steel overhead sign support structures will be paid for at the Contract Unit Price per structure for the "Refurbishment of Existing Steel Overhead Sign Support Structures", measured as specified herein and listed here below which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.
 - (i) S654 Bishop Grandin Blvd. WB, 2nd Structure East of Pembina Hwy.

E16.7.2 Repair of Defective Welds

- (a) Repair of defective welds will be paid for at the Contract Unit Price per linear centimetre of weld for "Repair of Defective Welds", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E17. REMOVAL OF EXISTING OVERHEAD SIGN SUPPORT STRUCTURES

E17.1 The Work covered under this item shall include all operations related to the removal and disposal or salvage of existing overhead sign support structures at the designated locations, in accordance with this Specification and as shown on the Drawings.

E17.2 The Work to be done by the Contractor under this Specification shall include the supply of all materials, and the furnishing of all superintendence, overhead, labour, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E17.3 Equipment

E17.3.1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order.

E17.4 Construction Methods

E17.4.1 Removal of Sign Support Structures

- (a) The Contractor shall submit a Removal Procedure Plan for each structure to be removed, including details of traffic control, to the Contract Administrator for review and approval. The Removal Procedure Plan shall be submitted at least twenty-one (21) Calendar Days prior to removing the overhead sign structure to arrange for installation of temporary signs and de-energizing the power supply as well as review/approval by City of Winnipeg Traffic Management Engineer.
- (b) The Contractor shall never lift an overhead sign structure or member over traffic.
- (c) The City of Winnipeg Traffic Services Branch will supply and install temporary sign posts as required. The power supply to the existing overhead sign support structures designated for removal and disposal will be de-energized by the City of Winnipeg Traffic Signals Branch.
- (d) The Contractor shall use a digital multimeter to verify that the electrical power supply to the structure has been de-energized prior to removal of the structure.
- (e) The Contractor shall remove the existing sign support structures carefully without damaging the existing anchor bolts and adjacent property.
- (f) All structures marked for disposal shall be hauled off site and disposed at an appropriate facility at the Contractor's expense. No separate payment will be made for disposal of the structure.
- (g) All structures marked for salvage, including hardware, shall be delivered to the City of Winnipeg Bridge Storage Yard. At the storage yard, the Contractor shall off-load the salvaged material with his/her own labour and equipment and place in the designated location indicated by the City Bridge Inspectors and as directed by the Contract Administrator.

E17.4.2 Removal of Sign Plates

- (a) The Contractor shall remove the existing sign plates, including existing steel sign mounting brackets, and deliver all components to the City of Winnipeg Traffic Services. The existing light fixtures and conduits shall be removed and disposed.

- (b) The Contractor shall take great care when handling existing or new sign plates. Any damage to the sign plates that has not been identified prior to removal will be repaired by Traffic Services. All costs and delays associated with the repair shall be borne by the Contractor.

E17.5 Measurement and Payment

E17.5.1 Removal of Existing Steel Overhead Sign Support Structures

- (a) Removal of existing steel overhead sign structures will be measured on a unit basis per structure removed and will be paid for at the Contract Unit Price for "Removal of Existing Steel Overhead Sign Support Structures" listed here below for sign structures removed and disposed or salvaged in accordance with this Specification and accepted by the Contract Administrator.
 - (i) S640 Vaughan Street Southbound North of Portage Avenue.

E18. SUPPLY AND INSTALLATION OF NEW STEEL OVERHEAD SIGN SUPPORT STRUCTURES

E18.1 Description

- (a) The Work covered under this item shall include all operations related to the supply, fabrication, delivery, and erection of new steel overhead sign support structures.
- (b) The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of the Work as hereinafter specified.

E18.2 Materials

E18.2.1 General

- (a) The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.
- (b) All materials used for fabrication of overhead sign support structures shall be new, previously unused material.

E18.2.2 Handling and Storage of Materials

- (a) All materials shall be handled in a careful and workmanship-like manner, to the satisfaction of the Contract Administrator.

E18.2.3 Structural Steel

- (a) Structural steel for all components of the overhead sign support structures shall be in accordance with CSA Standard G40.21 M, to the grades indicated on the Drawings. For purposes of hot-dip galvanizing, the silicon content in the steel shall be controlled within zero to three hundredths of a percent (0 to 0.03%) or fifteen hundredths to twenty-two hundredths of a percent (0.15 to 0.22%) for monotubular shafts and arms, and to less than three tenths of a percent (0.3%) for all other steel components.
- (b) The Contractor is advised that copies of mill test certificates showing the chemical and physical properties of all structural steel to be supplied under this Specification must be supplied to the Contract Administrator and be found acceptable prior to commencement of fabrication.
- (c) Steel shall not be acceptable unless the mill test certificate states the grade to be as indicated on the Drawings. Lower grade steel shall not be acceptable (despite favourable published mill test results). Items fabricated without steel certification shall be rejected.

- E18.2.4 Flange Bolts, Nuts, and Washers
- (a) Flange bolts, nuts, and washers shall be in accordance with ASTM A325, Type 1, hot-dip galvanized in accordance with ASTM F2329.
- E18.2.5 Fasteners for Handhole Covers
- (a) Fasteners for handhole covers shall be in accordance with ASTM A276 Type 316 stainless steel.
- E18.2.6 Hot-Dip Galvanizing
- (a) Hot-dip galvanizing of structural steel shall be in accordance with ASTM A123 for a minimum net retention of 610 g/m².
- E18.2.7 Galvanizing Touch-up and Field-Applied Galvanizing
- (a) Only approved products listed below shall be used for field-applied galvanizing, to touch-up damaged hot-dip galvanizing on-site and to galvanize field welds.
 - (b) Approved products for self-fluxing, low temperature, zinc-based alloy rods in accordance with ASTM A780-80 for "Repair of Damaged Hot-Dip Galvanized Coatings" are as follows:
 - (i) Galvalloy as manufactured by Metalloy Products Company, P.O. Box No. 3093, Terminal Annex, Los Angeles, California, available from Welder Supplies Limited, 150 McPhillips Street, Winnipeg; and
 - (ii) Welco Gal-Viz Galvanizing Alloy, as manufactured by Thermocote Welco, Highway 161, York Road, Kings Mountain, North Carolina, available from Welder Supplies Limited, 150 McPhillips Street, Winnipeg.
- E18.2.8 Cold Applied Galvanizing Compound
- (a) Approved cold-applied galvanizing compound is as follows:
 - (i) ZINGA, as manufactured by ZINGAMETALL, Ghent, Belgium, available from Pacific Evergreen Industries Ltd. Vancouver, BC, Ph. (604) 926-5564, and Centennial Mine & Industrial Supply, Saskatoon, Sask., Ph. (306) 975-1944.
- E18.2.9 Non-Shrink Grout
- (a) Grout as specified hereinafter shall be used for the construction of grout pads under sign structure base plates. Grout shall consist of a pre-mixed, non-metallic non-shrink grout. Approved products are:
 - (i) M-Bed Standard grout by Sternson Ltd.;
 - (ii) CPD Non-shrink grout by Master Builders;
 - (iii) set Non-shrink grout by Master Builders;
 - (iv) Sikadur VPC grout by Sika Canada Inc. for cold weather construction (0 °C to -20 °C).
 - (b) The grout shall be of a consistency suitable for the application intended, as approved by the Contract Administrator.
- E18.2.10 Sign Plates
- (a) Sign plates will be supplied and installed by the City of Winnipeg Traffic Services Branch.
- E18.2.11 Welding Consumables
- (a) Welding consumables for all processes shall be certified by the manufacturer to be complying with the requirements of CSA Standard W59-03 (R2008) and the following Specifications:
 - (i) manual shielded metal arc welding (SMAW): All electrodes shall be basic-type electrodes conforming to CSA W48-06 (R2011), classification E480XX, or imperial equivalent;

- (ii) gas metal arc welding (GMAW): All electrodes shall conform to CSA W48-06 (R2011), classification ER480S-X, or imperial equivalent;
 - (iii) flux cored arc welding (FCAW): All electrodes shall conform to CSA W48-06 (R2011), classification E480XT-X or imperial equivalent. Electrodes shall be controlled by hydrogen (CH) designation;
 - (iv) submerged arc welding (SAW): All electrodes shall conform to CSA W48-06 (R2011), classification F480X-EXXX or imperial equivalent;
 - (v) shielding gas shall be welding grade carbon-dioxide with a guaranteed dew point of -46°C; and
 - (vi) all electrodes, wires, and fluxes used shall be of a classification requiring a minimum impact of 27 joules at -18°C.
- (b) The proposed welding procedures and welding consumable certificates shall be submitted to the Contract Administrator for his/her approval at least two (2) Calendar Days prior to the scheduled commencement of any fabrication.

E18.2.12 Miscellaneous Materials

- (a) Miscellaneous material incidental to this Work shall be as approved by the Contract Administrator.

E18.2.13 Equipment

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

E18.3 Construction Methods

E18.3.1 General Requirements

- (a) Holes in the base plates shall be sized as shown on the Drawings, and provisions made for field erection must be accurate within plus or minus 13 mm between supports, without affecting final installation and load capacity.
- (b) The base plates for the sign support structures shall be constructed to be fully compatible and mountable on the anchor bolts, provided in the foundations by the Contractor.
- (c) Sufficient reinforced handholes and wiring holes shall be provided for lighting of the signs as shown on the Drawings. All wiring holes shall have threaded couplings. All unused coupling holes shall be capped with a threaded galvanized plug.
- (d) The sign support structure shall be so fabricated that erection can be achieved by means of bolted connections.
- (e) Each sign structure shall be provided with a "raised" structure identification number with a welding electrode in accordance with the details shown on the Drawings. The sign structure identification number shall be placed before hot-dip galvanizing.
- (f) Adequate venting and drainage holes shall be provided in enclosed sections for hot-dip galvanizing. The galvanizing facilities shall be consulted regarding the size and location of these holes.
- (g) Prior to fabrication, the dimensional limitations on the size and shape imposed by the galvanizing facilities shall be determined for hot-dip galvanizing the sign structures.

E18.3.2 Fabrication

- (a) All fabrication shall be carried out in accordance with this Specification and the Contract Drawings, as well as AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals - 2015 – 1st Edition, plus all subsequent revisions.
- (b) The punching of identification marks on the members will not be allowed, except for the structure identification number.

- (c) Any damage to members during fabrication shall be drawn to the attention of the Contract Administrator in order that the Contract Administrator may approve remedial measures.
- (d) Dimensions and fabrication details that control the field matching of parts shall receive very careful attention in order to avoid field adjustment.
- (e) All portions of the Work shall be neatly finished. Shearing, cutting, clipping, and machining shall be done neatly and accurately. Finished members shall be true to line, free from twists, bends, sharp corners, and edges.
- (f) Cut edges shall be true and smooth and free from excessive burrs or ragged breaks. Re-entrant cuts shall be avoided wherever possible. If used, they shall be filleted by drilling prior to cutting.
- (g) All holes shall be free of burrs and rough edges.

E18.3.3 Welding

- (a) Welding of steel structures shall be in accordance with CSA W59, "Welded Steel Construction."
- (b) All seams shall be continuously welded and free from any slag and splatter. Longitudinal welds shall be a minimum of sixty percent (60%) penetration, except those within 200 mm of baseplates, flanges, and circumferential welds, which shall be one hundred percent (100%) penetration. All circumferential groove welds shall be one hundred (100%) penetration, and where circumferential welds are used at a butt joint, an internal backup strip shall be provided.
- (c) Longitudinal seam welds in horizontal supports shall be located at the top of the horizontal members.
- (d) All welds shall be ground smooth and flush with the adjacent surface prior to hot-dip galvanizing.

E18.3.4 Surface Preparation and Cleaning

- (a) Surface preparation and cleaning of materials prior to hot-dip galvanizing shall be in accordance with ASTM A123 and SSPC Specification SP:6, "Commercial Blast Cleaning," unless otherwise specified herein. The Contractor shall ensure that all exterior and interior surfaces of vertical support members of sign structures are blast cleaned prior to pickling to achieve the minimum zinc coating mass of 610 g/m². All welding and provision of holes is to be completed prior to surface preparation and cleaning, except where shown on the Drawings.
- (b) The sandblasting and cleaning of sign structures shall be done in the shop.
- (c) After the structures have been sandblasted they shall be thoroughly cleaned of all sandblasting abrasive grit and debris, with special attention paid to areas of the structure where sand and debris collect, including but not limited to, behind the gusset plates, handholes and base plate.
- (d) After the sign structures have been sandblasted and cleaned, the Contract Administrator will carry out a visual inspection of the structures in the shop before they are shipped to the galvanizing plant.

E18.3.5 Hot-Dip Galvanizing

- (a) The hot-dip galvanizing plant shall be a Regular Member of the American Galvanizers Association, Inc.
- (b) All outside surfaces of the overhead sign support structures shall be hot-dip galvanized in accordance with ASTM A123 to a minimum net retention of 610 g/m².
- (c) Adequate venting and drainage holes shall be provided in enclosed sections for hot-dip galvanizing. The galvanizing facility shall be consulted regarding the size and location of these holes. Holes shall be provided by drilling not burning.

- (d) The galvanizing coating on outside surfaces of overhead sign support structures shall be generally smooth and free of blisters, lumpiness and runs. In particular, the outside surfaces of the bottom 2.5 m of the vertical support members shall have a smooth finish equal to the finish on hot-dipped galvanized handrails.
- (e) In addition to the provision of corrosion protection by the galvanized coating, the aesthetic appearance of the structure after hot-dip galvanizing will also be a criterion in the acceptance or rejection of the galvanized coating. The galvanized coating on the entire structure shall have a uniform "silver" colour and lustre. Galvanizing with parts of the structure having dull grey coating or streaks or mottled appearance will not be acceptable. If the galvanizing is rejected for aesthetic reasons, the Contractor shall rectify the appearance by applying spray-on molten zinc metallizing with 85/15 zinc/aluminum alloy. The metallizing shall be carried out in the shop before the structure is installed.
- (f) Minor defects in the galvanizing coating shall be repaired as specified here below for "Field-Applied Touch-Up Galvanizing". The Contract Administrator shall be consulted before repairs are made.
- (g) Other defects and contaminants in the galvanizing coating, such as heavy dross protrusions, flux inclusions and ash inclusions shall be grounds for rejection of the galvanizing coating system.
- (h) The Contractor shall verify the thickness of galvanized coatings as part of their own quality control testing and make their results available to the Contract Administrator.
- (i) All threaded couplings shall be rethreaded after the sign structures have been hot-dip galvanized.
- (j) The sign structures shall be stored on timber blocking after hot-dip galvanizing.

E18.3.6 Delivery and Erection

- (a) The Contractor shall notify the Contract Administrator at least two (2) Working Days in advance of the anticipated delivery to the Site and erection of the overhead sign support structures.
- (b) The sign structures shall be lifted and secured with nylon ropes or other approved methods. Use of steel chains and steel hooks against hot-dip galvanized or powder coated surfaces will not be permitted. The structure components (shaft and arm etc.) shall be placed on timber blocking and secured with nylon ropes during their transportation to the Site.

E18.3.7 Attachment of Structure to Anchor Bolts

- (a) Each anchor bolt shall be provided with two galvanized nuts: one nut below the base plate for levelling the structure, and one nut above the base plate for anchoring the structure. The anchor bolts shall have a minimum projection of 25 mm above the anchoring nuts. There shall be provision for maximum 50 mm thick grout pad under the base plate.
- (b) The threaded portions of the anchor bolts and nuts shall be treated with a wax based lubricant.
- (c) The Contractor shall plumb the shaft by adjusting the levelling and anchor nuts.
- (d) Levelling nuts and anchor nuts shall be tightened to a snug tight condition, defined as the full effort of an ironworker using an ordinary wrench, or a few impacts of an impact wrench.
- (e) The Contractor shall tighten the top anchoring nuts in an alternating "star" type pattern as follows:
 - (i) for anchor bolts less than or equal to 38 mm diameter: 1/3 of a turn (+20°, -0°) past a snug tight condition;
 - (ii) for anchor bolts greater than 38 mm diameter: 1/6 of a turn (+20°, -0°) past a snug tight condition.

E18.3.8 Structural Bolt Installation

- (a) Structural bolts for flange and splice connections shall be tightened in accordance with the turn-of-nut method as follows:
 - (i) alternately tighten all bolts to achieve a snug tight condition. The mating surfaces shall be in firm contact;
 - (ii) tighten all bolts in accordance with Table 1;
 - (iii) following tightening, check all bolts in the joint by hand using an ordinary wrench.

Table 1: Required Turns Past Snug Tight for Turn-of-Nut Method

Bolt Diameter <i>D</i> (inches)	Bolt Length up to $4D$		Bolt Length over $4D$ to $8D$		Bolt Length over $8D$ to $12D$	
	Length up to	Required Turns	Length Range	Required Turns	Length Range	Required Turns
1/2"	2"	1/3 ± 30°	2 to 4"	1/2 ± 30°	4 to 6"	2/3 ± 45°
5/8"	2.5"	1/3 ± 30°	2.5 to 5"	1/2 ± 30°	5 to 7.5"	2/3 ± 45°
3/4"	3"	1/3 ± 30°	3 to 6"	1/2 ± 30°	6 to 9"	2/3 ± 45°
7/8"	3.5"	1/3 ± 30°	3.5 to 7"	1/2 ± 30°	7 to 10.5"	2/3 ± 45°
1"	4"	1/3 ± 30°	4 to 8"	1/2 ± 30°	9 to 13.5"	2/3 ± 45°
1 1/8"	4.5"	1/3 ± 30°	4.5 to 9"	1/2 ± 30°	10 to 15"	2/3 ± 45°
1 1/4"	5"	1/3 ± 30°	5 to 10"	1/2 ± 30°	11 to 16.5"	2/3 ± 45°

E18.3.9 Installation of Sign Plates

- (a) The City of Winnipeg will be responsible for installation of sign plates, unless otherwise noted on the Drawings.
- (b) The Contractor shall take great care when handling existing or new plates. Any damage to the sign plates that has not been identified prior to removal will be repaired by Traffic Services. All costs and delays associated with the repair shall be borne by the Contractor.

E18.3.10 Grout Pads

- (a) New grout pads shall be constructed under sign structure bases after erection has been completed to the satisfaction of the Contract Administrator incidental to the Work of this item.
- (b) Where the sign structure is being installed on a refurbished concrete pile foundation, the Contractor shall ensure that:
 - (i) the pile surface is thoroughly cleaned, removing dirt, debris, and damaged concrete;
 - (ii) damaged areas on the pile top surface or on the pile top edges shall be formed with sonotube and cast together with the grout pad to restore the original pile geometry. Sonotube shall be removed once grout has set; and,
 - (iii) finish grout to ensure positive drainage of water away from the base plate.

E18.3.11 Field-Applied Touch-up Galvanizing

- (a) Any areas of damaged galvanizing on the sign structures shall receive field-applied touch-up galvanizing.
- (b) Surfaces to receive touch-up galvanizing shall be cleaned using a wire brush, a light grinding action, or mild blasting to remove loose, scale, rust, paint, grease, dirt, or other contaminants.

- (c) For self-fluxing, low temperature, zinc based alloy rods, preheat the surface to 315°C and wire brush the surface during preheating. Rub the cleaned preheated area with the repair stick to deposit an evenly distributed layer of zinc alloy. Spread the alloy with a wire brush, spatula, or similar tool. Field-applied galvanizing shall be blended into existing galvanizing of surrounding surfaces and shall be buffed and polished if required to match the surrounding surfaces. Care shall be taken to not overheat surfaces beyond 400°C and to not apply direct flame to the alloy rods.
- (d) For cold applied galvanizing compound, the approved product shall be applied by either a brush or roller. The compound shall be applied in three (3) coats, with each coat having a dry film thickness of 60 µm (2.36 mils). Each coat shall be left to dry for a minimum of one (1) hour before the application of the next coat.

E18.4 Quality Control

E18.4.1 General

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

E18.4.2 Welding Qualifications

- (a) The Contractor shall produce evidence that the plant has recently been fully approved by the C.W.B. to the requirements of CSA W47.1 Division 2.1 for welding of steel structures.
- (b) Approved welding procedures shall be submitted to the Contract Administrator prior to fabrication of any steel items.

E18.4.3 Testing

- (a) In addition to the Contractor's own quality control testing of all materials, welding procedures and steel fabrication including hot-dip galvanizing will be inspected and tested by the Contract Administrator to ascertain compliance with the Specifications and Drawings.
- (b) The Contract Administrator will hire a testing agency certified by the Canadian Welding Bureau to carry out shop fabrication inspection and testing before the overhead sign support structures are approved ready for installation of coating system. The inspector shall have access to all of the fabricator's normal quality control records for this Contract, specified herein. Inspection and testing will include:
 - (i) visual inspection of one hundred percent (100%) of welds;
 - (ii) ultrasonic testing of one hundred percent (100%) of full penetration sections of longitudinal seam welds and circumferential butt welds;
 - (iii) magnetic particle testing of a random ten percent (10%) of partial penetration sections of longitudinal seam welds;
 - (iv) ultrasonic testing of twenty-five percent (25%) of base plate and flange plate welds; and
 - (v) inspection of hot-dip galvanizing and coating thickness.
- (c) Welds that are found by any of the inspection and testing methods to be inadequate and unsatisfactory shall be repaired in accordance with CSA W59 and then retested. The cost of the repairs and the cost of the retest shall be paid for by the Contractor.

- (d) No repair shall be made until agreed to by the Contract Administrator.
- (e) Defects in hot-dip galvanizing shall be rectified as directed by the Contract Administrator.

E18.4.4 Unacceptable Work

- (a) Any Work found to be unacceptable shall be corrected in accordance with CSA W59.
- (b) No repair shall be made until agreed to by the Contract Administrator.

E18.5 Measurement and Payment

E18.5.1 Supply and Installation of New Steel Overhead Sign Support Structures

- (a) Supply and installation of new steel overhead sign support structures will be measured on a unit basis per new steel overhead sign support structure supplied and installed, and will be paid for at the Contract Unit Price for "Supply and Installation of New Steel Overhead Sign Support Structures" listed here below for steel overhead sign support structures supplied and installed in accordance with this Specification and accepted by the Contract Administrator.
 - (i) TLS-088 Vaughan Street Southbound North of Portage Avenue.

APPENDIX 'A'

TRAFFIC CONTROL PLAN