



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 459-2017

**REGIONAL STREETS RENEWAL PROGRAM – PROVENCHER, MILL & FILLS, AND
INTERSECTION IMPROVEMENTS**

TABLE OF CONTENTS

PART A - BID SUBMISSION

Form A: Bid	1
Form B: Prices	4
Form G1: Bid Bond and Agreement to Bond	29
Form G2: Irrevocable Standby Letter of Credit and Undertaking	31

PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Site Investigation	1
B4. Enquiries	1
B5. Confidentiality	1
B6. Addenda	2
B7. Substitutes	2
B8. Bid Components	3
B9. Bid	4
B10. Prices	4
B11. Disclosure	5
B12. Qualification	5
B13. Bid Security	6
B14. Opening of Bids and Release of Information	6
B15. Irrevocable Bid	7
B16. Withdrawal of Bids	7
B17. Evaluation of Bids	8
B18. Award of Contract	8

PART C - GENERAL CONDITIONS

C0. General Conditions	1
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PART D - SUPPLEMENTAL CONDITIONS

General

D1. General Conditions	1
D2. Scope of Work	1
D3. Contract Administrator	2
D4. Contractor's Supervisor	2
D5. Ownership of Information, Confidentiality and Non Disclosure	2
D6. Notices	2
D7. Furnishing of Documents	3

Submissions

D8. Authority to Carry on Business	3
D9. Safe Work Plan	3
D10. Insurance	3
D11. Performance Security	4
D12. Subcontractor List	4
D13. Detailed Work Schedule	4

Schedule of Work

D14. Commencement	5
D15. Working Days	5
D16. Restricted Work Hours	5
D17. Work By Others	5
D18. Sequence of Work	6
D19. Substantial Performance	6
D20. Total Performance	6
D21. Liquidated Damages	7

D22. Scheduled Maintenance	7
Control of Work	
D23. Job Meetings	7
D24. Prime Contractor – The Workplace Safety and Health Act (Manitoba)	8
D25. The Workplace Safety and Health Act (Manitoba) – Qualifications	8
Measurement and Payment	
D26. Payment	8
Warranty	
D27. Warranty	8
Form H1: Performance Bond	9
Form H2: Irrevocable Standby Letter of Credit	11
Form J: Subcontractor List	13

PART E - SPECIFICATIONS

General

E1. Applicable Specifications and Drawings	1
E2. Pavement Testhole Report	1
E3. Protection Of Existing Trees	2
E4. Traffic Control	2
E5. Traffic Management	3
E6. Refuse and Recycling Collection	4
E7. Water Obtained From the City	4
E8. Pedestrian Safety	4
E9. Surface Restorations	4
E10. Supply and Installation of Pavement Repair Fabric	5
E11. Partial Depth Patching of Existing Joints	5
E12. Salt Tolerant Grass Seeding	7
E13. Mountable Curb and Gutter	7
E14. Asphalt Levelling Over Full Depth Concrete Repairs	8
E15. Tree Removal	9
E16. Installation of River Stone	10
E17. Crash Attenuation Barriers	10
E18. Cast-In-Place Concrete Pile Foundations	11
E19. Overhead Sign Support Structure	18

Appendix 'A' – Pavement Testhole Report

PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 Regional Streets Renewal Program – Provencher, Mill & Fills, and Intersection Improvements

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, June 30, 2017.

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.

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/bidopp.asp>
- 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.
- B6.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 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 B17.
- 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, hard copy;
 - (c) Bid Security
 - (i) Form G1: Bid Bond and Agreement to Bond, or
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
a certified cheque or draft;
- B8.2 Further to B8.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B7.
- B8.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely.
- B8.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B8.4.1 Samples or other components of the Bid 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.
- B8.4.2 A hard copy of Form B: Prices must be submitted with the Bid. If there is any discrepancy between the Adobe PDF version of Form B: Prices and the Microsoft Excel version of Form B: Prices, the PDF version shall take precedence.
- B8.5 Bidders are advised not to include any information/literature except as requested in accordance with B8.1.
- B8.6 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 B17.1(a).
- B8.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B8.8 Bids shall be submitted to:
- The City of Winnipeg
Corporate Finance Department
Materials Management Division

185 King Street, Main Floor
Winnipeg MB R3B 1J1

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 12 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 and the corporate seal, if the corporation has one, shall be affixed;
 - (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.
- B9.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B10. PRICES

- B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B10.1.1 For the convenience of Bidders, and pursuant to B8.4.2 and B17.4.2, an electronic spreadsheet Form B: Prices in Microsoft Excel (.xls) format is available along with the Adobe PDF documents for this Bid Opportunity on the Bid Opportunities page at the Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- 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

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/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

- (a) Written confirmation of a safety and health certification meeting SAFE Work Manitoba's SAFE Work Certified Standard (e.g., COR™ and SECOR™) or
 - (i) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
 - (ii) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program or
- (b) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information

Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>.

- 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. BID SECURITY

- B13.1 The Bidder shall provide bid security in the form of:
- (a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or
 - (b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking 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 included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or
 - (c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.
- B13.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.
- B13.1.2 All signatures on bid securities shall be original.
- B13.1.3 The Bidder shall sign the Bid Bond.
- B13.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.
- B13.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.
- B13.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B13.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.
- B13.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.
- B13.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

B14. OPENING OF BIDS AND RELEASE OF INFORMATION

- B14.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.
- B14.1.1 Bidders or their representatives may attend.

- B14.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B13 will not be read out.
- B14.2 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/>
- B14.3 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/>
- B14.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).

B15. IRREVOCABLE BID

- B15.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.
- B15.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid.

B16. WITHDRAWAL OF BIDS

- B16.1 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.
- B16.1.1 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.
- B16.1.2 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 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B16.1.3 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 12 of Form A: Bid; and
 - (c) if the notice has been given by any one of the persons specified in B16.1.3(b), declare the Bid withdrawn.
- B16.2 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 B15.2 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, including the right to retain the Bidder's bid security.

B17. EVALUATION OF BIDS

- B17.1 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 therefrom (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.
- B17.2 Further to B17.1(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.
- B17.3 Further to B17.1(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.
- B17.4 Further to B17.1(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.
- B17.4.1 Further to B17.1(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.
- B17.4.2 The electronic Form B: Prices and the formulas imbedded in that spreadsheet are only provided for the convenience of Bidders. The City makes no representations or warranties as to the correctness of the imbedded formulas. It is the Bidder's responsibility to ensure the extensions of the unit prices and the sum of Total Bid Price performed as a function of the formulas within the electronic Form B: Prices are correct.
- ## **B18. AWARD OF CONTRACT**
- B18.1 The City will give notice of the award of the Contract or will give notice that no award will be made.
- B18.2 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.
- B18.2.1 Without limiting the generality of B18.2, 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.
- B18.3 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 B17.
- B18.3.1 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.

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:

- (a) Pavement Rehabilitation
 - (i) Provencher Blvd EB lanes from East limit of the RRX at DesMeurons St to Archibald St
- (b) Mill & Fill
 - (i) Lagimodiere Blvd NB lanes from Dugald Rd to Regent Ave W
 - (ii) Broadway EB & WB lanes from Portage Ave to Sherbrook St
 - (iii) McPhillips St NB lanes from Redwood Ave to College Ave
 - (iv) McPhillips St SB lanes from Mountain Ave to Redwood Ave
 - (v) Ness Ave EB & WB lanes from Moray St to Olive St
- (c) Intersection Improvements
 - (i) Lagimodiere Blvd at Sage Creek Blvd

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

- (a) Pavement Rehabilitation
 - (i) Planing of existing asphalt pavement
 - (ii) Complete pavement patching
 - (iii) Renewal of existing curbs
 - (iv) Complete curb renewal at intersections
 - (v) Construct splash strip
 - (vi) Renewal of existing sidewalk and installation of detectable warning surface tiles
 - (vii) Replace curb inlets with catch pits
 - (viii) Adjust drainage inlets, manholes, catch basins and water valves
 - (ix) Placement of asphalt overlay (average thickness – 80mm)
 - (x) Boulevard restoration
- (b) Mill & Fill
 - (i) Planing of asphalt overlay
 - (ii) Full depth concrete repairs of existing slabs and joints
 - (iii) Adjustment of drainage inlets, water valves, manholes, and catch basins
 - (iv) Renewal of existing curb
 - (v) Placement of asphalt overlay (average thickness – 60mm)
 - (vi) Renewal of existing miscellaneous concrete slabs and installation of detectable warning surface tiles
 - (vii) Boulevard restoration
- (c) Intersection Improvements
 - (i) Removal of curbs, concrete pavement and asphalt shoulders
 - (ii) Excavation of roadway cross-section
 - (iii) Placement of sub-base and base materials

- (iv) Construction of concrete left turn lane
- (v) Construction of concrete curbs, sidewalk and medians

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is Stantec Consulting Ltd, represented by:

Dylan Mourant, C.E.T.
Project Manager

Telephone No. 204 478-8969 Email Address dylan.mourant@stantec.com

D3.2 At the pre-construction meeting, Dylan Mourant, C.E.T. 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

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.

D4.2 At least two (2) business days prior to the commencement of any Work on the site, the Contractor shall provide the Contract Administrator with a phone number where the supervisor identified in D4.1 or an alternate can be contacted twenty-four (24) hours a day to respond to an emergency.

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 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 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

- D6.4 Bids Submissions must not be submitted to this facsimile number. Bids must be submitted in accordance with B8.**

D7. FURNISHING OF DOCUMENTS

- D7.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him/her at cost.

SUBMISSIONS

D8. AUTHORITY TO CARRY ON BUSINESS

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

D9. SAFE WORK PLAN

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

D10. INSURANCE

- D10.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least 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, broad form property damage cover and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
 - (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence;
 - (c) an all risks Installation Floater carrying adequate limits to cover all machinery, equipment, supplies and/or materials intended to enter into and form part of any installation.

- D10.2 Deductibles shall be borne by the Contractor.
- D10.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in the C4.1 for the return of the executed Contract.
- D10.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D11. PERFORMANCE SECURITY

- D11.1 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.
- D11.1.1 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.
- D11.2 If the bid security provided in his/her Bid was not a certified cheque or draft pursuant to B13.1(c), 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 letter of intent and prior to the commencement of any Work on the Site and in no event later than the date specified in the C4.1 for the return of the executed Contract.

D12. SUBCONTRACTOR LIST

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

D13. DETAILED WORK SCHEDULE

- D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.
- D13.2 The detailed work schedule shall consist of the following:
- (a) a Gantt chart for the Work acceptable to the Contract Administrator.
- D13.3 Further to D13.2(a), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

SCHEDULE OF WORK

D14. COMMENCEMENT

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

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

- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D8;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the twenty-four (24) hour emergency response phone number specified in D4.2.
 - (iv) the Safe Work Plan specified in D9;
 - (v) evidence of the insurance specified in D10;
 - (vi) the performance security specified in D11;
 - (vii) the subcontractor list specified in D12;
 - (viii) the detailed work schedule specified in D13.
- (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

D14.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.

D14.4 The City intends to award this Contract by July 21, 2017

D14.4.1 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.

D15. WORKING DAYS

D15.1 Further to C1.1(jj);

D15.1.1 The Contract Administrator will determine daily if a Working Day has elapsed and will record his/her assessment. On a weekly basis the Contract Administrator will provide the Contractor with a record of the Working Days assessed for the preceding week. The Contractor shall sign each report signifying that he/she agrees with the Contract Administrator's determination of the Working Days assessed for the report period.

D15.1.2 Work done to restore the Site to a condition suitable for Work, shall not be considered "work" as defined in the definition of a Working Day.

D16. RESTRICTED WORK HOURS

D16.1 Further to clause 3.10 of CW 1130, the Contractor shall require written permission forty-eight (48) hours in advance from the Contract Administrator for any work to be performed between 2000 hours and 0700 hours, or on Saturdays, Sundays, Statutory Holidays and or Civic Holidays.

D17. WORK BY OTHERS

D17.1 Work by others on or near the Site will include but not necessarily be limited to:

- (a) City of Winnipeg Traffic Services Department – Provide necessary regulatory signs and replacement of signs and paint lines. The Contractor is expected to cooperate with the City of Winnipeg to facilitate;

- (b) City of Winnipeg Traffic Signals – Traffic signal loops may require decommissioning and reinstallation. Traffic signal pole relocation at Lagimodiere Blvd and Sage Creek Blvd. The Contractor is expected to cooperate with the City of Winnipeg for facilitate construction;
- (c) Winnipeg Transit – The Contractor will be required to coordinate with Winnipeg Transit to maintain service during construction; and
- (d) Manitoba Hydro – Manhole adjustments. The contractor is expected to coordinate with Manitoba Hydro for the adjustment of any hydro manholes or required riser rings.
- (e) Manitoba Hydro – Street Lights. The contractor is expected to cooperate with Manitoba Hydro for the relocation of street lights in the sidewalk at the SW corner of Provencher Blvd and Des Meurons Rd.
- (f) Bell MTS – Manhole adjustments. The contractor is expected to coordinate with Bell MTS for the adjustment of any Bell MTS manholes or required riser rings.

D18. SEQUENCE OF WORK

D18.1 Further to C6.1, the sequence of work shall be as follows:

- D18.1.1 Construction activity is to be limited to three work areas of the Contract at one time. No construction shall commence on subsequent work areas until all the work is completed in one of the three work areas.
- D18.1.2 For the purposes of D18.1.1 McPhillips Street northbound from Redwood Avenue to College Avenue and McPhillips Street southbound from Mountain Avenue to Redwood Avenue shall count as a single work area.
- D18.1.3 For Provencher Rehabilitation the Contractor shall delay placing the final asphalt lift on the roadway until roadway works have been completed, so that the final lift is placed in one operation. Where pavement repair fabric is to be installed, the first and final lift of asphalt shall be placed on the same day to ensure proper installation of the reinforcing material. The Contractor is to coordinate the Works to meet this requirement.
- D18.1.4 Due to the 2017 Canada Summer Games, the City of Winnipeg has identified *construction restriction zones* to limit potential impacts to pedestrian and vehicular traffic between July 27 and August 13, 2017. Broadway from Sherbrook Street to Maryland Street is included in one such zone and therefore construction work on Broadway will not be allowed to proceed within these dates

D19. SUBSTANTIAL PERFORMANCE

- D19.1 The Contractor shall achieve Substantial Performance within sixty (60) consecutive Working Days of the commencement of the Work as specified in D14.
- D19.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D19.3 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.

D20. TOTAL PERFORMANCE

- D20.1 The Contractor shall achieve Total Performance within sixty five (65) consecutive Working Days of the commencement of the Work as specified in D14.
- D20.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract

Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.

D20.3 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.

D21. LIQUIDATED DAMAGES

D21.1 If the Contractor fails to achieve Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:

- (a) Substantial Performance – Three thousand dollars (\$3,000.00);
- (b) Total Performance – One thousand five hundred dollars (\$1,500.00).

D21.2 The amounts specified for liquidated damages in D21.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Substantial Performance or Total Performance by the days fixed herein for same.

D21.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D22. SCHEDULED MAINTENANCE

D22.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

- (a) Reflective crack maintenance as specified in CW 3250-R7;
- (b) Seeding as specified in CW 3520-R7; and
- (c) Sodding as specified in CW 3510-R9.

D22.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

CONTROL OF WORK

D23. JOB MEETINGS

D23.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.

D23.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

D24. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D24.1 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).

D25. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

D25.1 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

D26. PAYMENT

D26.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D27. WARRANTY

D27.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire one (1) years thereafter for Provencher Blvd Rehabilitation and the streets where Mill & Fills are performed , and two (2) years thereafter for the Intersection Improvements at Lagimodiere Blvd and Sage Creek Blvd, unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

D27.2 Notwithstanding C13.2the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if:

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

D27.2.1 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 D11)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$_____.)

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

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

BID OPPORTUNITY NO. 459-2017

Regional Streets Renewal Program – Provencher, Mill & Fills, and Intersection Improvements 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 D11)**

(Date)

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

RE: PERFORMANCE SECURITY – BID OPPORTUNITY NO. 459-2017

Regional Streets Renewal Program – Provencher, Mill & Fills, and Intersection Improvements

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>	<u>Drawing (Original) Sheet Size</u>
P-3484-01	Cover Page, Drawing Index and Site Location Map	A1
P-3484-02	Lagimodiere Boulevard – STA 0+984 to STA 1+470 – Mill and Fill	11" x 17"
P-3484-03	Lagimodiere Boulevard – STA 1+470 to STA 1+980 – Mill and Fill	11" x 17"
P-3484-04	Lagimodiere Boulevard – STA 1+980 to STA 2+377 – Mill and Fill	11" x 17"
P-3484-05	Ness Avenue – STA 0+963 to STA 1+450 – Mill and Fill	11" x 17"
P-3484-06	McPhillips Avenue – STA 0+479 to STA 0+777 – Mill and Fill	11" x 17"
P-3484-07	Broadway Street – STA 1+000 to 1+440 – Mill and Fill	11" x 17"
P-3484-08	Provencher Boulevard – Rue Des Meurons to Rue Archibald - Rehabilitation	A1
P-3484-09	Provencher Boulevard – Rue Des Meurons to Rue Archibald – Rehabilitation	A1
P-3484-10	Provencher Boulevard – Rue Des Meurons to Rue Archibald – Rehabilitation	A1
P-3484-11	Provencher Boulevard – Rue Des Meurons to Rue Archibald – Rehabilitation	A1
P-3484-12	Lagimodiere Boulevard – Southbound Left Turn at Sage Creek Boulevard	A1
P-3484-13	Lagimodiere Boulevard – Overhead Sign Location and Details	A1
P-3484-14	Lagimodiere Boulevard – Fabrication Details	A1
P-3484-15	Lagimodiere Boulevard – Crash Attenuation Details and Sections	A1

E2. PAVEMENT TESTHOLE REPORT

- E2.1 Further to C3.1, the pavement testhole report is provided to demonstrate average pavement conditions that will be encountered during construction on the project. The pavement testhole report is contained in Appendix 'A'.

E3. PROTECTION OF EXISTING TREES

- E3.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing boulevard trees within the limits of the construction area:
- (a) The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of trees.
 - (b) Trees identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400mm wood planks, or suitably protected as approved by the Contract Administrator.
 - (c) 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 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.
 - (d) Operation of equipment within the dripline of the trees 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. The dripline of a tree 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 are located.
 - (e) Work on-site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.
- E3.2 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.
- E3.3 No separate measurement or payment will be made for the protection of trees.
- E3.4 Except as required in clause E3.1(c) and E3.1(e), Elm trees shall not be pruned at any time between April 1 and July 31.

E4. TRAFFIC CONTROL

- E4.1 Further to clauses 3.6, 3.7 and 3.8 of CW 1130:
- (a) Where directed by the Contract Administrator, the Contractor shall construct and maintain temporary asphalt ramps to alleviate vertical pavement obstructions such as manholes and planing drop-offs to the satisfaction of the Contract Administrator. Payment shall be in accordance with CW3410.
 - (b) In accordance with the Manual of Temporary Traffic Control on City Streets (MTTC), the Contractor ("Construction Agency" in the manual) shall be responsible for placing, maintaining and removing the appropriate temporary traffic control devices as specified by the MTTC or by the Traffic Management Branch of the City of Winnipeg Public Works Department. The Contractor shall bear all costs associated with the placement of temporary traffic control devices by their own forces or subcontractor.
- E4.2 Notwithstanding E4.1, in accordance with the MTTC, the Contract Administrator shall make arrangements with the **Traffic Services Branch of the City of Winnipeg** to place, maintain, and remove all **regulatory signs** and traffic control devices authorized and/or required by the Traffic Management Branch in the following situations:
- (a) Parking restrictions,
 - (b) Stopping restrictions,
 - (c) Turn restrictions,
 - (d) Diamond lane removal,
 - (e) Full or directional closures on a Regional Street,

- (f) Traffic routed across a median,
- (g) Full or directional closure of a non-regional street where there is a requirement for regulatory signs (turn restrictions, bus stop relocations, etc.) to implement the closure.
- (h) Approved Designated Construction Zones with a temporary posted speed limit reduction. Traffic Services will be responsible for placing all of the advance signs and 'Construction Ends' (TC-4) signs. The Contractor is still responsible for all other temporary traffic control including but not limited to barricades, barrels and tall cones.

E4.2.1 An exception to E4.2 is the 'KEEP RIGHT/KEEP LEFT' sign (RB-25 / RB-25L) which shall be supplied, installed, and maintained by the Contractor at their own expense.

E4.2.2 Further to E4.2, where the Contract Administrator has determined that the services of the Traffic Services Branch are required, the City shall bear the costs associated with the placement of temporary traffic control devices by the Traffic Services Branch of the City of Winnipeg in connection with the works undertaken by the Contractor.

E5. TRAFFIC MANAGEMENT

E5.1 Further to clause 3.7 of CW 1130:

E5.1.1 Single lane closures on intersecting and/or adjoining Regional Streets shall only be permitted during non-peak periods when required for construction activities when approved by the Traffic Management Branch. Storage/parking of materials, equipment or vehicles is not permitted on Regional Streets at any time unless approved by the Contract Administrator, in consultation with the Traffic Management Branch.

E5.1.2 Maintain a minimum of one lane of traffic in each direction during construction, including during paving and milling operations. When no work is being performed on site, non-essential lane closures will not be permitted.

E5.1.3 As an exception to E5.1.2, maintain a minimum of two southbound lanes of traffic on McPhillips Street during the morning peak period (07:00 – 09:00) and maintain a minimum of two northbound lanes of traffic on McPhillips Street during the afternoon peak period (15:30 – 17:30).

E5.1.4 As an exception to E5.1.2, maintain a minimum of two northbound lanes of traffic on Lagimodiere Boulevard during the morning peak period (07:00 – 09:00) and the afternoon peak period (15:30 – 17:30).

E5.1.5 Where left turn lanes exist, an additional lane to accommodate the left turn storage lane shall be maintained at all times.

E5.1.6 Maintain the eastbound Provencher Boulevard right turn cut off at Archibald Street at all times unless catch basin relocation or planing/paving operations require temporary complete closures, as directed by the Contract Administrator. Temporary complete closures shall be no longer than 10 minutes during asphalt planing/paving operations and shall be completed during off peak hours.

E5.1.7 Maintain the westbound Broadway right turn cut off to Portage Avenue at all times unless planing/paving operations require temporary complete closures. Temporary complete closures shall be no longer than 10 minutes during asphalt planing/paving operations and shall be completed during off peak hours.

E5.1.8 Intersecting local street, median opening and private approach access shall be maintained at all times unless joint/slab repairs or planing/paving operations require temporary closure. Temporary closures are to be staggered such that consecutive intersections are not closed at the same time. Traffic on intersecting regional/collector streets shall be maintained at all times unless planing/paving operations require temporary complete closures. Temporary complete closures shall be no longer than 10 minutes during asphalt planing/paving operations and shall be completed during off peak hours.

- E5.1.9 As an exception of E5.1.8, movements will be restricted to right turns only from side streets onto McPhillips Street at unsignalized intersections.
- E5.1.10 Flag persons may be necessary to maintain the flow of traffic during certain work operations.
- E5.1.11 Should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he/she shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 24 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.
- E5.1.12 Pedestrian access must be maintained at all times.
- E5.1.13 Ambulance/emergency vehicle access must be maintained at all times.

E6. REFUSE AND RECYCLING COLLECTION

- E6.1 While access to refuse and/or recycling collection vehicles is restricted, on collection day(s) the Contractor shall move all of the affected property owners refuse and/or recycling materials to a nearby common area, prior to an established time, in accordance with E6.2 to permit the normal collection vehicles to collect the materials. Immediately following recycling collection the Contractor shall return recycling receptacles to the addresses marked on the receptacles.

- E6.2 Collection Schedule:

Ness Avenue from Moray Street to Olive Street (north side)

<i>Collection Day(s):</i>	Friday
<i>Collection Time:</i>	To Be Confirmed
<i>Common Collection Area:</i>	North East Corner of Ness Avenue & Olive Street

- E6.3 Refuse and Recycling will be picked up on Monday for Broadway, will be picked up on Tuesday for Provencher Boulevard, Lagimodiere Boulevard, and the west side of McPhillips Street, and will be picked up on Friday for the south side of Ness Avenue and the east side of McPhillips Street. Access to all refuse and recycling pickup locations must be maintained.
- E6.4 No measurement or payment will be made for the work associated with this specification.

E7. WATER OBTAINED FROM THE CITY

- E7.1 Further to clause 3.7 of CW 1120, the Contractor shall pay for all costs, including sewer charges, associated with obtaining water from the City in accordance with the Waterworks and Sewer By-laws.

E8. PEDESTRIAN SAFETY

- E8.1 During the project, a temporary snow fence shall be installed adjacent to all excavations to be left open over night and construction activities. The Contractor shall be responsible for maintaining the snow fence in a proper working condition. No measurement for payment shall be made for this work.

E9. SURFACE RESTORATIONS

- E9.1 Further to clause 3.3 of CW 1130, 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.

E10. SUPPLY AND INSTALLATION OF PAVEMENT REPAIR FABRIC

DESCRIPTION

E10.1 General

E10.1.1 This specification covers the supply and installation of pavement repair fabric.

E10.1.2 Referenced Standard Construction

(a) CW 3130 – Supply and Installation of Geotextile Fabrics.

MATERIALS

E10.2 Storage and Handling

E10.2.1 Store and handle material in accordance with Section 2 of CW 3130.

E10.3 Pavement Repair Fabric

E10.3.1 Pavement repair fabric will be Glas Grid Road Reinforcement Mesh - Style 8501 or approved equal.

CONSTRUCTION METHODS

E10.4 General

E10.4.1 Install pavement repair fabric at random locations as directed by the Contract Administrator.

E10.4.2 The extent of the placement limits and quantities required will be determined by the Contract Administrator and provided 48 hours prior to the placement of asphalt.

E10.4.3 Proceed with installation upon completion and acceptance of the asphalt levelling course.

E10.4.4 Install fabric in accordance with the manufacturer's specifications and recommendations.

E10.4.5 Only construction equipment required to place the final asphalt surface course will be allowed to travel on the exposed fabric.

E10.4.6 Replace damaged or improperly placed fabric.

E10.4.7 Ensure temperature of the asphalt material does not exceed the melting point of the fabric.

MEASUREMENT AND PAYMENT

E10.5 Pavement Repair Fabric

E10.5.1 The supply and installation of the pavement repair fabric will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Pavement Repair Fabric". The area to be paid for will be the total number of square metres of pavement repair fabric supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E11. PARTIAL DEPTH PATCHING OF EXISTING JOINTS

DESCRIPTION

E11.1 General

E11.1.1 This specification covers the Partial Depth Patching of existing concrete pavement joints.

E11.2 Referenced Standard Construction Specifications

- (a) CW 3230 – Full-Depth Patching of Existing Slabs and Joints
- (b) CW 3410 – Asphalt Concrete Pavement Works

MATERIALS

E11.3 Asphalt Materials

E11.3.1 Asphalt material will be Type 1A supplied in accordance with Sections 5 and 6 of CW 3410.

E11.4 Tack Coat

E11.4.1 Tack Coat will be undiluted SS-1 emulsified asphalt or approval equal.

CONSTRUCTION METHODS

E11.5 Planing of Joints

E11.5.1 Plane existing joints designated by the Contract Administrator to a minimum depth of 50 mm and a maximum of depth 90 mm to remove ravelled or deteriorated concrete. Width of joint to be planed will vary with depth.

E11.5.2 Should the depth of joint deterioration exceed the maximum indicated, as determined by the Contract Administrator, the entire joint shall be renewed and paid for in accordance with CW 3230 as a full depth joint repair. Planing completed shall be paid for in accordance with Section 14.7 of this specification

E11.5.3 Dispose of material in accordance with Section 3.4 of CW 1130.

E11.6 Placement of Asphalt Material

E11.6.1 Prior to placement of asphalt material, the planed joint shall be swept or blow clean of any loose material.

E11.6.2 Apply Tack Coat uniformly on the entire surface of the planed joint. The application rate shall not exceed 0.23 litres per square metre. The planed joint shall be dry prior to applying the tack coat.

E11.6.3 Place and compact asphalt material in accordance with Section 9.3 of CW 3410 to the satisfaction of the Contract Administrator. The finished elevation of the patch shall be flush with surrounding pavement surface.

E11.6.4 Compact the asphalt material to an average 95% of the 75 blow Marshall Density of the paving mixture with no individual test being less than 90 %.

E11.6.5 Ensure that no traffic is allowed to travel over the patched area until the asphalt has cooled to atmospheric temperature.

MEASUREMENT AND PAYMENT

E11.7 Partial Depth Planing of Existing Joints

E11.7.1 Partial Depth Planing of Existing Joints will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Partial Depth Planing of Existing Joints". The area to be paid for will be the total number of square metres of joints planed in accordance with this specification, accepted and measured by the Contract Administrator.

E11.8 Asphalt Patching of Partial Depth Joints

E11.9 Asphalt Patching of Partial Depth Joints will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Asphalt Patching of Partial Depth Joints". The area to be paid for will be the total number of square metres of joints patched in accordance with this specification, accepted, and measured by the Contract Administrator.

E12. SALT TOLERANT GRASS SEEDING

DESCRIPTION

- E12.1 Further to CW 3520 and CW3540, this specification shall cover sub-grade preparation and the supply and placement of Salt Tolerant Grass Seed.

MATERIALS

- E12.2 Salt Tolerant Grass Seed

- E12.2.1 Salt Tolerant Grass Seed for regional and collector boulevards, medians and interchange areas shall be a mixture composed of:

- (a) Seventy percent (70%) Fults or Nuttals Alkaligrass (*Puccinellia* spp.), twenty percent (20%) Audubon or Aberdeen Creeping Red Fescue and ten percent (10%) Perennial Ryegrass.

EQUIPMENT

- E12.3 Scarification equipment shall be suitable for the area being scarified, shall be capable of scarifying the sub-grade to the specified depth and shall be accepted by the Contract Administrator. For confined areas a toothed bucket may be acceptable. For larger areas tilling equipment may be required.

CONSTRUCTION METHODS

- E12.4 Preparation of Existing Grade

- E12.4.1 Prior to placing topsoil, in areas to be seeded greater in width than 600mm, prepare the existing sub-grade by scarifying to a minimum depth of 75mm and to a maximum depth of 100mm to the satisfaction of the Contract Administrator.

- E12.4.2 Scarification shall consist of breaking up and loosening the sub-grade. No scarification shall occur within the edge of a tree canopy (or drip line).

- E12.5 Salt Tolerant Grass Seeding

- E12.5.1 Salt Tolerant Grass Seed shall be sown at a rate of 2.2 kilograms per 100 square meters.

MEASUREMENT AND PAYMENT

- E12.6 Supply, placement and maintenance of Salt Tolerant Grass Seed will be paid for at the Contract Unit Price per square metre for "Salt Tolerant Grass Seeding", measured as specified herein, which price shall be payment in full for supplying all materials and for completing all operations herein described and all other items incidental to the work included in this Specification. Payment for Salt Tolerant Grass Seeding shall be in accordance with the following:

- (a) Sixty five (65%) percent of quantity following supply and placement.
(b) Remaining thirty five (35%) percent of quantity following termination of the Maintenance Period.

E13. MOUNTABLE CURB AND GUTTER

DESCRIPTION

- E13.1 Further to CW 3240 and CW 3310, this specification shall cover the construction of mountable curb and gutter.

- E13.2 Referenced Standard Construction Specifications

- (a) CW 3110 – Sub-Grade, Sub-Base, and Base Course Construction
(b) CW 3235 – Renewal of Existing Curbs

(c) CW 3310 – Portland Cement Concrete Pavement Works

CONSTRUCTION METHODS

E13.3 Preparation

E13.3.1 Pavement will be removed as shown on the drawings, in accordance with CW 3110.

E13.4 Installation of 100mm Mountable Curb

E13.4.1 Install Mountable Curb in accordance with SD-201 with a curb height of 100mm

E13.5 Installation of Mountable Curb and Gutter

E13.5.1 Install curb and gutter at the locations shown on the Drawings or as directed by the Contract Administrator in accordance with SD-200 with a mountable curb, 120mm or 100mm curb height as noted on the Drawings.

(a) Where installation is against 230mm finished concrete, the gutter pan will match the depth of the existing concrete slab.

(b) Where installation is against asphalt over concrete(100mm of asphalt over 230mm of concrete), the gutter pan will tie into the concrete and be poured to the height of the finished asphalt.

MEASUREMENT AND PAYMENT

E13.6 Construction of Curb and Gutter

E13.6.1 Construction of 120mm Mountable Curb and Gutter will be measured on a length basis and paid for at the Contract Unit Price per metre for "Construction of Curb and Gutter (120mm ht, Mountable Curb, Integral, 600 mm width, 230 mm Plain Concrete Pavement)" or "Construction of Curb and Gutter (120mm ht, Mountable Curb, Integral, 600 mm width, 330 mm Plain Concrete Pavement)". The length to be paid for shall be the total number of metres constructed in accordance with this Specification, as measured and accepted by the Contract Administrator. The amount paid 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.

E13.6.2 Construction of 100mm Mountable Curb and Gutter will be measured on a length basis and paid for at the Contract Unit Price per metre for "Construction of Curb and Gutter (100mm ht, Mountable Curb, Integral, 600 mm width, 330 mm Plain Concrete Pavement)". The length to be paid for shall be the total number of metres constructed in accordance with this Specification, as measured and accepted by the Contract Administrator. The amount paid 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.

E13.7 Construction of 100mm Mountable Curb

E13.7.1 Construction of 100mm Mountable Curb will be measured on a length basis and paid for at the Contract Unit Price per metre for "Construction of Mountable Curb 100mm (Integral)". The length to be paid for shall be the total number of metres constructed in accordance with this Specification, as measured and accepted by the Contract Administrator. The amount paid 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.

E14. ASPHALT LEVELLING OVER FULL DEPTH CONCRETE REPAIRS

DESCRIPTION

E14.1 General

E14.1.1 This specification covers the construction of asphalt levelling over full depth concrete joint repairs on streets to be resurfaced where the entire existing asphalt overlay is not removed;

E14.2 Referenced Standard Construction Specifications
(a) CW 3410 – Asphalt Concrete Pavement Works

MATERIALS

E14.3 Asphalt Materials

E14.3.1 Asphalt material will be Type 1A supplied in accordance with Sections 5 and 6 of CW 3410

E14.4 Equipment

E14.4.1 Equipment as per CW 3410

CONSTRUCTION METHODS

E14.5 Asphalt Levelling over Full Depth Concrete Repairs

E14.5.1 Place asphaltic concrete over the newly constructed slab replacement and joint repairs. Remove any loose or debonded asphalt at the joint perimeter and place new asphaltic concrete in these areas as well;

E14.5.2 Dispose of all material in accordance with Section 3.4 of CW 1130;

E14.5.3 Prior to placement of asphaltic concrete patching material, ensure surface is clean and dry;

E14.5.4 Prepare the joint surface with a uniform application of Tack Coat applied in small quantities sufficient to wet the concrete surface;

E14.5.5 Place and compact asphaltic concrete over the joint repair in accordance with CW 3410 and to the satisfaction of the Contract Administrator so that the finished elevation of the patch is flush with surrounding asphaltic milled surface;

E14.5.6 Ensure that no traffic is allowed to cross the patched area until the asphalt has cooled to atmospheric temperature.

MEASUREMENT AND PAYMENT

E14.6 Asphalt Levelling over Full Depth Concrete Repairs

E14.6.1 Asphalt Levelling over Full-Depth Concrete Repairs will be measured on a weight basis and paid for at the Contract Unit Price per metric tonne for “Asphalt Levelling over Full Depth Concrete Repairs.” The weight to be paid for will be the total number of metric tonnes of asphalt placed and compacted in accordance with this Specification, accepted and measured by the Contract Administrator.

E15. TREE REMOVAL

DESCRIPTION

E15.1 General

E15.1.1 Further to CW 3010 and the City of Winnipeg “Tree Removal Guidelines”, this specification shall cover the removal of trees as specified on the Drawings and as directed by the Contract Administrator.

CONSTRUCTION METHODS

E15.2 Remove trees in accordance with CW 3010.

MEASUREMENT AND PAYMENT

- E15.3 Tree removal will be measured on a unit basis and will be paid for at the Contract Unit Price per unit for "Tree Removal," which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E16. INSTALLATION OF RIVER STONE

DESCRIPTION

- E16.1 General

- E16.1.1 This specification covers the supply and installation of river stone.

MATERIALS

- E16.2 River stone supplied is to match or be equivalent to the river stone currently along the back of the south sidewalk near the west limit of construction.

CONSTRUCTION METHODS

- E16.3 Supply and install the river stone behind the sidewalk where designated on the drawings.

MEASUREMENT AND PAYMENT

- E16.4 Installation of River Stone will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Supply and Installation of River Stone". The area to be paid for shall be the total number of square metres installed in accordance with this Specification, as measured and accepted by the Contract Administrator. The amount paid 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. CRASH ATTENUATION BARRIERS

DESCRIPTION

- E17.1 General

- E17.1.1 This Specification shall cover all operations related to the supply, fabrication, delivery and installation of the Crash Attenuation Barriers and associated materials in accordance with NCHRP Report 350 Test Level 3.

- E17.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of the Work as hereinafter specified. All materials supplied under this Specification shall be subject to inspection and acceptance by the Contract Administrator.

- E17.1.3 Site specific requirements for installation of Crash Attenuation Barriers will be in accordance with the Contract Drawings. General supply, loading, hauling, unloading, storing and installing is as per Manufacturer's recommended procedures.

- E17.1.4 The Contractor shall provide manufacturers product data sheet and Shop Drawings prior to supply and installation. The Shop Drawings will be subject to acceptance by the Contract Administrator.

MATERIALS

- E17.2 Materials shall be supplied in accordance with the manufacturer's product manual and in accordance with NCHRP Report 350.

E17.3 The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this specification.

E17.4 Approved product is:

(a) Quadguard II and associated hardware by Trinity Highway Products.

E17.5 Appurtenances including but not limited to posts, neoprene spacer blocks, Quadbeam panels, and associated hardware shall be in accordance with NCHRP Report 350.

CONSTRUCTION METHODS

E17.6 The Crash Attenuation Barriers shall be installed in accordance with the manufacturer's installation manual.

E17.7 Related items, including concrete foundations, reinforcing steel, Quadbeam panels, posts, neoprene spacer blocks, connection hardware, excavation, granular levelling materials and compaction shall be installed as per the Contract Drawings.

MEASUREMENT AND PAYMENT

E17.8 Supply and Installation of Crash Attenuation Barrier shall be measured on a unit basis and paid for at the Contract Unit Price for "Supply and Installation of Crash Attenuation Barrier", as measured and accepted by the Contract Administrator. This item shall include all product materials, concrete foundations, reinforcing steel, Quadbeam panels, posts, neoprene spacer blocks, connection hardware, excavation granular levelling materials and compaction and all incidental items not specified elsewhere for payment.

E18. CAST-IN-PLACE CONCRETE PILE FOUNDATIONS

DESCRIPTION

E18.1 General

E18.1.1 This Specification shall cover all concreting operations related to construction of cast-in-place concrete pile foundations.

E18.1.2 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, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

MATERIALS

E18.2 General

E18.2.1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.

E18.3 Handling and Storage of Materials

E18.3.1 All materials shall be handled and stored in a careful and workmanlike manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with CSA Standard A23.1-09.

E18.4 Testing and Approval

E18.4.1 All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the Testing Laboratory designated by the Contract Administrator. There shall be no charge to the City for any materials taken by the Contract Administrator for testing purposes.

E18.4.2 All materials shall be approved by the Contract Administrator at least seven (7) days before any construction is undertaken. If, in the opinion of the Contract Administrator, such

materials in whole or in part, do not conform to the Specifications detailed herein or are found to be defective in manufacture or have become damaged in transit, storage, or handling operations, then such materials shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.

E18.5 Patching Mortar

E18.5.1 The patching mortar shall be made of the same cementitious material and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than 1 part cement to 2 parts sand by damp loose volume. White Portland Cement shall be substituted for a part of the grey Portland Cement on exposed concrete in order to produce a colour matching the colour of the surrounding concrete, as determined by a trial patch. The quantity of mixing water shall be no more than necessary for handling and placing.

E18.6 Cement

E18.6.1 Cement shall be Type HS or HSb, high-sulphate-resistant hydraulic cement, conforming to the requirements of CSA Standard A23.1-09.

E18.7 Concrete

E18.7.1 General

(a) Concrete repair material shall be compatible with the concrete substrate.

E18.7.2 The Contractor shall be responsible for the design and performance of all concrete mixes supplied under this specification. Either ready mix concrete or proprietary repair mortars, where applicable, may be used having the following minimum properties in accordance with CSA A23.1-09:

(a) Class of Exposure: S-1

(b) Compressive Strength @ 28 days = 35 MPa

(c) Water / Cementing Materials Ratio = 0.4

(d) Air Content: Category 2 per Table 4 of CSA A23.1-09 (4-7%)

(e) Cement – shall be as specified in E16.6.

E18.7.3 Mix design for ready mix concrete shall be submitted to Contract Administrator at least two weeks prior to concrete placing operations.

E18.7.4 The workability of each concrete mix shall be consistent with the Contractor's placement operations. Self-compacting concrete may be used for pile foundations.

E18.7.5 Any proposed proprietary repair mortar shall be subject to the approval of the Contract Administrator and must meet or exceed the properties of the ready mix concrete.

E18.7.6 The temperature of all types of concrete shall be between 15°C and 25°C at discharge. Temperature requirements for concrete containing silica fume shall be between 10°C and 18°C at discharge unless otherwise approved by the Contract Administrator.

E18.7.7 Concrete materials susceptible to frost damage shall be protected from freezing.

E18.8 Aggregate

E18.8.1 The Contractor shall be responsible for testing the fine and coarse aggregates to establish conformance to these specifications, and the results of these tests shall be provided to the Contract Administrator if requested. All aggregates shall comply with CSA A23.1.

E18.8.2 Coarse Aggregate

(a) The maximum nominal size of coarse aggregate shall be sized to suit the Contractor's mix design. Gradation shall be in accordance with CSA A23.1, Table 11, Group 1. The coarse aggregate shall satisfy the Standard Requirements specified in CSA A23.1, Table 12, "Concrete Exposed to Freezing and Thawing".

- (b) Coarse aggregate shall consist of crushed stone or gravel or a combination thereof, having hard, strong, durable particles free from elongation, dust, shale, earth, vegetable matter or other injurious substances. Coarse aggregate shall be clean and free from alkali, organic or other deleterious matter; and shall have an absorption not exceeding 2.25%.
- (c) The aggregate retained on the 5 mm sieve shall consist of clean, hard, tough, durable, angular particles with a rough surface texture, and shall be free from organic material, adherent coatings of clay, clay balls, and excess of thin particles or any other extraneous material.
- (d) Coarse aggregate when tested for abrasion in accordance with ASTM C131 shall not have a loss greater than 30%.
- (e) Tests of the coarse aggregate shall not exceed the limits for standard requirements prescribed in CSA A23.1, Table 12, for concrete exposed to freezing and thawing.
- (f) Fine aggregate shall meet the grading requirements of CSA A23.1, Table 10, Gradation FA1.
- (g) Fine aggregate shall consist of sand, stone, screenings, other inert materials with similar characteristics or a combination thereof, having clean, hard, strong, durable, uncoated grains free from injurious amounts of dust, lumps, shale, alkali, organic matter, loam, or other deleterious substances.
- (h) Tests of the fine aggregate shall not exceed the limits for standard requirements prescribed in CSA A23.1, Table 12.

E18.9 Cementing Materials

E18.9.1 Cementing materials shall conform to the requirements of CSA A3001.

E18.9.2 Silica Fume

- (a) Should the Contractor choose to include silica fume in the concrete mix design, it shall not exceed 8% by mass of cement.

E18.9.3 Fly Ash

- (a) Fly ash shall be Type C1 or Type F and shall not exceed 25% by mass of cement.

E18.9.4 Cementitious materials shall be stored in a suitable weather-tight building that shall protect these materials from dampness and other destructive agents. Cementitious materials that have been stored for a length of time resulting in the hardening or formation of lumps shall not be used in the Work.

E18.10 Admixtures

E18.10.1 Air entraining admixtures shall conform to the requirements of ASTM C260.

E18.10.2 Chemical admixtures shall conform to the requirements of ASTM C494 or C1017 for flowing concrete.

E18.10.3 All admixtures shall be compatible with all other constituents. The addition of calcium chloride, accelerators, and air-reducing agents will not be permitted, unless otherwise approved by the Contract Administrator.

E18.10.4 Appropriate low range water reducing and/or superplasticizing admixtures shall be used in concrete containing silica fume. Approved retarders or set controlling admixtures may be used for concrete containing silica fume.

E18.10.5 An aminocarboxylate based migrating corrosion inhibitor admixture shall be used in concrete that will be used as a repair material that will either be in contact with or adjacent to reinforcing steel in existing concrete. Proposed admixtures shall be subject to the approval of the Contract Administrator.

E18.11 Water

E18.11.1 Water used for mixing concrete shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances. It shall be equal to potable water in physical and chemical properties.

E18.12 Concrete Supply

E18.12.1 Concrete shall be proportioned, mixed, and delivered in accordance with the requirements of CSA A23.1, except that the transporting of ready mixed concrete in non-agitating equipment will not be permitted unless prior written approval is received from the Contract Administrator.

E18.12.2 Unless otherwise directed by the Contract Administrator, the discharge of ready mixed concrete shall be completed within 120 minutes after the introduction of the mixing water to the cementing materials and aggregates.

E18.12.3 The Contractor shall maintain all equipment used for handling and transporting the concrete in a clean condition and proper working order.

E18.13 Reinforcing Steel

E18.13.1 Reinforcing steel shall be deemed to include all reinforcing bars, tie-bars, and dowels.

E18.13.2 All reinforcing steel shall conform to the requirements of CSA Standard G30.18, Grade 400 W, Billet-Steel Bars for Concrete Reinforcement. All reinforcing steel shall be new deformed billet steel bars. All bars, including ties, shall be hot-dip galvanized in accordance with ASTM A767 for a minimum net retention of 610 g/m². Reinforcing steel supply and installation will be incidental to construction of concrete pile foundation and no separate payment will be made.

E18.14 Anchor Bolts, Nuts, and Washers

E18.14.1 Anchor bolts, nuts, and washers shall be in accordance with ASTM F1554, and shall be hot-dip galvanized full length in accordance with ASTM F2329 for a minimum net retention of 610 g/sq.m, for the entire length of the anchor bolts. The threaded portion of the anchor bolts shall be 300 mm long. Anchor bolt supply and installation will be incidental to construction of concrete pile foundation and no separate payment will be made.

E18.15 Anchor Bolt Templates

E18.15.1 Anchor bolt templates shall be CSA G40.21 Grade 300W, minimum 10 mm thick, and will be incidental to construction of new concrete pile foundation and no separate payment will be made.

E18.16 Miscellaneous Materials

E18.16.1 Miscellaneous materials shall be of the type specified on the Drawings or approved by the Contract Administrator.

CONSTRUCTION METHODS

E18.17 Location and Alignment of Piles

E18.17.1 Pile construction shall not commence until the Contractor has obtained clearance from the appropriate Utility Authorities.

E18.17.2 Piles shall be placed in the positions shown on the Drawings and as directed by the Contract Administrator in the field.

E18.17.3 The deviation of the axis of any finished pile shall not differ by more than 1 percent from the vertical.

E18.18 Buried Utilities

E18.18.1 The Contractor shall exercise extreme caution when constructing the pile foundations in the vicinity of existing buried utilities and buildings. The Drawings show the approximate

locations of existing buried utilities. The Contractor shall be responsible for obtaining the exact location of the buried utilities from the appropriate Utility Authorities prior to installing the piles.

- E18.18.2 The proposed locations of the pile foundations may be changed by the Contract Administrator if they interfere with the buried utilities.
- E18.18.3 The Contractor shall be responsible for all costs that may be incurred for repair/rectification of any damage caused to the existing buried utilities as a result of the Contractor's operations in constructing cast-in-place concrete piles, as determined by the Contract Administrator.

E18.19 Excavation

- E18.19.1 The Contractor is responsible for determining the excavation method at each pile location. For quantity purposes, Hydro-Jet excavation has been assumed whenever a utility or building appears to be within one metre of the edge of the pile or if there are overhead utility lines.
- E18.19.2 Excavations for piles shall be made with equipment designed to remove a core of the diameter shown on the Drawings, or hydro-jet excavation to a depth to bypass and/or expose adjacent utilities. A pile will be considered to be "hydro-jet excavated" if at least 0.5 vertical metres of earth is excavated using hydro-jet excavation methods.
- E18.19.3 It may be necessary to hydro-jet excavate utilities adjacent to a pile location to adequately ascertain the location or provide enough "slack" in conduits to move them slightly to avoid interference with the pile locations. The Contract Administrator may elect to alter the location of a pile if hydro-jet excavation shows that utilities cannot be avoided. If the pile location must be altered, the Contractor will be paid for the abandonment of the pile due to utility interference.
- E18.19.4 Upon reaching the required elevation, the bottom of the excavation shall be cleaned as directed by the Contract Administrator in the field.
- E18.19.5 All excavated material from the piles shall be promptly hauled away from the Site to an approved disposal area as located by the Contractor.
- E18.19.6 Upon completion of the cleaning out of the bottom to the satisfaction of the Contract Administrator, the reinforcement and anchor bolts shall be set in place and the concrete poured immediately. Under no circumstances shall a hole be left to stand open after boring has been completed.
- E18.19.7 If any hole is condemned because of caving, it shall be filled with lean-mix concrete and a new hole bored as near as possible to the location shown on the Drawings. In locations where underground utilities have been exposed, the underground utilities shall be covered with clean sand to 300 mm above the utility. Payment will not be made for condemned piles.

E18.20 Sleeving

- E18.20.1 Steel or corrugated metal pipe sleeving shall be used to temporarily line the bore to prevent bulging or caving of the walls and to protect men at work in the bore.
- E18.20.2 The sleeving shall be designed by the Contractor and constructed to resist all forces that may tend to distort it.
- E18.20.3 The sleeving shall be withdrawn as the concrete is placed in the bore. The sleeving shall extend at least 1 m below the top of the freshly deposited concrete at all times.
- E18.20.4 The clearance between the face of the bore hole and the sleeving shall not exceed 75 mm.
- E18.20.5 The sleeving may remain cast-in-place if required to protect nearby utilities at the direction of the Contract Administrator. The top of the sleeving shall be 300 mm below the top of the sidewalk.

E18.21 Inspection of Bores

- E18.21.1 Concrete shall not be placed in a bore until the bore has been inspected and approved by the Contract Administrator.
- E18.21.2 The Contractor shall have available suitable light for the inspection of each bore throughout its entire length.
- E18.21.3 All improperly set sleeving, bore, or bottom shall be corrected to the satisfaction of the Contract Administrator.

E18.22 Placing Reinforcing Steel

- E18.22.1 Reinforcement shall be:
 - (a) placed in accordance with the details shown on the Drawings
 - (b) rigidly fastened together, and
 - (c) lowered into the bore intact before concrete is placed.
- E18.22.2 Spacers shall be utilized to properly locate the reinforcing steel cage in the bore.

E18.23 Placing Anchor Bolts

- E18.23.1 The anchor bolts shall be aligned with a steel template matching the bolt holes in the sign structure base plate. The setting template shall be held in place by the top and bottom nuts of the anchor bolts. Extreme care shall be used in this operation. Placement of anchor bolts without the steel template will not be permitted.
- E18.23.2 The threaded portion of the anchor bolts projecting above the top surface of pile shall be coated with oil, before the concrete is poured, to minimize the fouling of threads splattered by concrete residue.

E18.24 Forms

- E18.24.1 For bored piles, the top of the piles shall be formed with tubular forms (Sonotube) to a minimum depth of 1000 mm below final grade.
- E18.24.2 For "hydro-jet excavated" piles the top of the piles shall be formed with tubular forms (Sonotube) to a minimum depth of 1500 mm below final grade.
- E18.24.3 In locations of caving, the tubular form (Sonotube) should extend a minimum of 500 mm below where the shaft becomes uniform. The minimum depth of the tubular forms (Sonotube) shall be as specified by E13.3.8 (a) and E13.3.8 (b).
- E18.24.4 The forms shall be sufficiently rigid to prevent lateral or vertical distortions from the loading environment to which they shall be subjected. Forms shall be set to the design grades, lines, and dimensions, as shown on the Drawings.

E18.25 Placing Concrete

- E18.25.1 Care shall be taken to ensure that anchor bolts are vertically aligned and that anchor bolts and conduits are properly positioned prior to placement of concrete.
- E18.25.2 Concrete shall not have a free fall of more than 2.0 m and shall be placed so that the aggregates will not separate or segregate. The slump of the concrete shall not exceed 110 mm. The concrete shall be vibrated throughout the entire length of the pile.
- E18.25.3 Concrete shall be placed to the elevations as shown on the Drawings. The top surface of the pile shall be finished smooth and even with a hand float.
- E18.25.4 The shaft shall be free of water prior to placing of concrete. Concrete shall not be placed in or through water unless authorized by the Contract Administrator. In the event that tremie concrete is allowed by the Contract Administrator, the concrete shall be placed as specified herein.

E18.25.5 All concrete, during and immediately after deposition, shall be consolidated by mechanical vibrations so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into the corners of forms; eliminating all air or stone pockets that may cause honeycombing, pitting or places of weakness.

E18.26 Tremie Concrete

E18.26.1 The shaft of the pile shall be pumped clear of water so that the bottom can be cleaned. Pumping shall then be stopped and water shall be allowed to come into the bore until a state of equilibrium is reached. Concrete shall then be placed by means of a tremie pipe. The tremie pipe shall have a suitable gate in the bottom to prevent water from entering the pipe. The bottom of the pipe shall be maintained below the surface of the freshly placed concrete. The pipe shall be capable of being raised or lowered quickly in order to control the flow of concrete.

E18.26.2 Tremie concrete shall be poured up to a depth of 600 mm or as the Contract Administrator directs. Pumps shall then be lowered into the bore and the excess water pumped out. The laitance that forms on top of the tremie shall then be removed and the remainder of the concrete shall be placed in the dry bore.

E18.27 Protection of Newly Placed Concrete

E18.27.1 Newly laid concrete threatened with damage by rain, snow, fog, or mist shall be protected with a tarpaulin or other approved means.

E18.28 Curing Concrete

E18.28.1 The top of the freshly finished concrete piles shall be covered and kept moist by means of wet polyester blankets immediately following finishing operations and shall be maintained at above 10°C for at least seven (7) consecutive days thereafter.

E18.28.2 After the finishing is completed, the surface shall be promptly covered with a minimum of a single layer of clean, damp polyester blanket.

E18.28.3 Concrete shall be protected from the harmful effects of sunshine, drying winds, surface dripping or running water, vibration, and mechanical shock. Concrete shall be protected from freezing until at least twenty-four hours after the end of the curing period.

E18.28.4 Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3° in one hour or 20° in twenty-four hours.

E18.29 Form Removal

E18.29.1 Forms shall not be removed for a period of at least 24 hours after the concrete has been placed. Removal of forms shall be done in a manner to avoid damage to, or spalling of, the concrete.

E18.29.2 The minimum strength of concrete in place for safe removal of forms shall be 20 MPa.

E18.29.3 Field-cured test specimens, representative of the in-place concrete being stripped, will be tested to verify the concrete strength.

E18.30 Patching of Formed Surfaces

E18.30.1 Immediately after forms around top of pile have been removed, but before any repairing or surface finishing is started, the concrete surface shall be inspected by the Contract Administrator. Any repair of surface finishing started before this inspection may be rejected and required to be removed.

E18.30.2 All formed concrete surfaces shall have bolts, ties, struts, and all other timber or metal parts not specifically required for construction purposes cut back fifty (50) mm from the surface before patching.

E18.30.3 Minor surface defects caused by honeycomb, air pockets greater than 5 mm in diameter, and voids left by strutting, and tie holes shall be repaired by removing the defective

concrete to sound concrete, dampening the area to be patched and then applying patching mortar. A slurry grout consisting of water and cement shall be well brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck-off slightly higher than the surface and left for one hour before final finishing to permit initial shrinkage of the patching mortar and it shall be touched up until it is satisfactory to the Contract Administrator. The patch shall be cured as specified in this Specification, and the final colour shall match the surrounding concrete.

E18.31 Cold Weather Concreting

E18.31.1 Protection of concrete shall be considered incidental to its placement. The temperature of the concrete shall be maintained at or above 10°C for a minimum of seven (7) days or until the concrete has reached a minimum compressive strength of 20 MPa, by whatever means are necessary. Concrete damaged as a result of inadequate protection against weather conditions shall be removed and replaced by the Contractor at his own expense. Also, concrete allowed to freeze prior to the three (3) days will not be accepted for payment.

E18.32 Quality Control

E18.32.1 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 or 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.

E18.32.2 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.

MEASUREMENT AND PAYMENT

E18.33 Cast-In-Place Concrete Pile Foundations shall be measured on a unit basis and paid for at the Contract Unit Price for "Construction of Cast-In-Place Concrete Pile Foundations" in accordance with this Specification and accepted by the Contract Administrator. This item shall include construction of new cast-in-place concrete foundations, supply and installation of anchor bolts and steel template and all incidental items not specified elsewhere for payment.

E19. OVERHEAD SIGN SUPPORT STRUCTURE

DESCRIPTION

E19.1 General

E19.1.1 This Specification shall cover all operations related to the supply, fabrication, delivery, and erection of new steel overhead sign support structures.

E19.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of the Work as hereinafter specified.

MATERIALS

E19.2 General

E19.2.1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.

E19.2.2 All materials used for fabrication of overhead sign support structures shall be new, previously unused material.

E19.3 Handling and Storage of Materials

E19.3.1 All materials shall be handled in a careful and workmanship-like manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with the requirements of CSA Standard CAN3 A23.1.8-M77, Storage of Materials, except as otherwise specified herein.

E19.4 Structural Steel

E19.4.1 Structural steel for all components of the overhead sign support structures shall be in accordance with CSA Standard G40.21 M, Grade 350 W. For purposes of hot-dip galvanizing, the silicon content in the steel shall be controlled within 0 to 0.03%.

E19.4.2 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.

E19.4.3 Steel shall not be acceptable unless the mill test certificate states the grade to be 350 MPa (50 ksi) minimum yield for the items specified above. Lower grade steel shall not be acceptable (despite favourable published mill test results). Items fabricated without steel certification shall be rejected.

E19.5 Flange Bolts, Nuts, and Washers

E19.5.1 Flange bolts, nuts, and washers shall be in accordance with ASTM A325 hot-dip galvanized.

E19.6 Hardware for Handhole Covers

E19.6.1 Hardware for handhole covers shall be in accordance with ASTM A276 Type 316 stainless steel.

E19.7 Hot-Dip Galvanizing

E19.7.1 All hot-dip galvanizing shall be in accordance with ASTM Standard A123 – 09 for a minimum net retention of 610 g/m².

E19.8 Galvanizing Touch-up and Field-Applied Galvanizing

E19.8.1 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.

E19.8.2 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:

- (a) 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
- (b) 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.

E19.9 Approved cold-applied galvanic anti-corrosion system is as follows:

E19.9.1 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.

E19.10 Anchor Bolts and Setting Template

E19.10.1 Anchor bolts including nuts and washers, and setting template shall be in accordance with CSA G40.21 Grade 300 W, hot-dip galvanized. Anchor bolts, nuts, washers, and setting template shall be supplied and paid for under, "New Cast-in-Place Concrete Pile Foundations", specified herein.

E19.11 Non-Shrink Grout

E19.11.1 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:

- (a) M-Bed Standard grout by Sternson Ltd.;
- (b) CPD Non-shrink grout by Master Builders;
- (c) Set Non-shrink grout by Master Builders; and
- (d) Sikadur VPC grout by Sika Canada Inc. for cold weather construction (0 C to -20 C).

E19.11.2 The grout shall be of a consistency suitable for the application intended, as approved by the Contract Administrator.

E19.12 Sign Plates

- (a) Sign plates will be supplied and installed by the City of Winnipeg Traffic Services Branch.

E19.13 Welding Consumables

E19.13.1 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:

- (a) Manual shielded metal arc welding (SMAW): All electrodes shall be basic-type electrodes conforming to CSA W48-06 (R2011), classification E480XX, or imperial equivalent;
- (b) Gas metal arc welding (GMAW): All electrodes shall conform to CSA W48-06 (R2011), classification ER480S-X, or imperial equivalent;
- (c) 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;
- (d) Submerged arc welding (SAW): All electrodes shall conform to CSA W48-06 (R2011), classification F480X-EXXX or imperial equivalent;
- (e) Shielding gas shall be welding grade carbon-dioxide with a guaranteed dew point of -46°C; and
- (f) All electrodes, wires, and fluxes used shall be of a classification requiring a minimum impact of 27 joules at -18°C.

E19.13.2 The proposed welding procedures and welding consumable certificates shall be submitted to the Contract Administrator for his approval at least two (2) days prior to the scheduled commencement of any fabrication.

E19.14 Miscellaneous Materials

E19.14.1 Miscellaneous material incidental to this Work shall be as approved by the Contract Administrator.

E19.15 Equipment

E19.15.1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order.

CONSTRUCTION METHODS

E19.16 General Requirements

E19.16.1 Holes in the base plates shall be oversized by 6 mm, and provisions made for field erection must be accurate within plus or minus 13 mm between supports, without affecting final installation and load capacity.

- E19.16.2 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.
- E19.16.3 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.
- E19.16.4 The sign support structure shall be so fabricated that erection can be achieved by means of bolted connections.
- E19.16.5 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.
- E19.16.6 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.
- E19.16.7 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.

E19.17 Fabrication

- E19.17.1 All fabrication shall be carried out in accordance with this Specification and the Contract Drawings, as well as AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals - 2009 - 5th Edition, plus all subsequent revisions.
- E19.17.2 The punching of identification marks on the members will not be allowed, except for the structure identification number.
- E19.17.3 Dimensions and fabrication details that control the field matching of parts shall receive very careful attention in order to avoid field adjustment.
- E19.17.4 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.
- E19.17.5 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.
- E19.17.6 All holes shall be provided by drilling not burning. All holes shall be free of burrs and rough edges.

E19.18 Welding

- E19.18.1 Welding of steel structures shall be in accordance with CSA W59, "Welded Steel Construction."
- E19.18.2 All seams shall be continuously welded and free from any slag and splatter. Longitudinal welds shall be a minimum of 60% penetration, except those within 200 mm of baseplates, flanges, and circumferential welds, which shall be 100% penetration. All circumferential groove welds shall be 100% penetration, and where circumferential welds are used at a butt joint, an internal backup strip shall be provided.
- E19.18.3 Longitudinal seam welds in horizontal supports shall be located at the top of the horizontal members.
- E19.18.4 All welds shall be ground smooth and flush with the adjacent surface prior to hot-dip galvanizing.

E19.19 Surface Preparation and Cleaning

- E19.19.1 Surface preparation and cleaning of materials prior to hot-dip galvanizing shall be in accordance with CSA G164 and SSPC Specification SP:10, "Near White Metal 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 600 g/m². All welding and provision of holes is to be completed prior to surface preparation and cleaning, except where shown on the Drawings.

- E19.19.2 The sandblasting and cleaning of sign structures shall be done in the shop.
- E19.19.3 After the sign structures have been sandblasted and cleaned, all components shall be blown with compressed air to remove blast cleaning debris (e.g. sand). Special attention shall be made to remove debris trapped in cavities behind the gusset plates and base plates.
- E19.19.4 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.
- E19.20 Hot-Dip Galvanizing
- E19.20.1 The hot-dip galvanizing plant shall be a Regular Member of the American Galvanizers Association, Inc. and certified to CSA G164.
- E19.20.2 All outside surfaces of the overhead sign support structures, as well as the interior surfaces of all vertical support members of the overhead sign support structures, shall be hot-dip galvanized in accordance with the requirements of this Specification.
- E19.20.3 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.
- E19.20.4 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.
- E19.20.5 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 metalizing with 85/15 zinc/aluminum alloy. The metalizing shall be carried out in the shop before the structure is installed.
- E19.20.6 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. Use of cold applied spray-on galvanizing will not be permitted and will be cause for rejection.
- E19.20.7 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.
- E19.20.8 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.
- E19.20.9 All threaded couplings shall be rethreaded after the sign structures have been hot-dip galvanized.
- E19.20.10 The sign structures shall be stored on timber blocking after hot-dip galvanizing.
- E19.21 Delivery and Erection
- E19.21.1 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.

- E19.21.2 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.
- E19.21.3 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.
- E19.21.4 The Contractor shall ensure that the anchoring nuts of the anchor bolts are tightened according to the "turn-of-nut" method of the AASHTO Code.
- E19.22 Installation of Sign Plates
- E19.22.1 The City of Winnipeg will be responsible for installation of sign plates.
- E19.23 Grout Pads
- E19.23.1 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.
- E19.24 Field-Applied Touch-up Galvanizing
- E19.24.1 Any areas of damaged galvanizing on the sign structures shall receive field-applied touch-up galvanizing.
- E19.24.2 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.
- E19.24.3 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.
- E19.24.4 For pure zinc paint or spray on systems, the approved product Zinga shall be applied by either a brush or roller. The Zinga shall be applied in 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.

QUALITY CONTROL

- E19.25 General
- E19.25.1 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; and
- E19.25.2 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.
- E19.26 Welding Qualifications

E19.26.1 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; and

E19.26.2 Approved welding procedures shall be submitted to the Contract Administrator prior to fabrication of any steel items.

E19.27 Testing

E19.27.1 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;

E19.27.2 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:

- (a) Visual inspection of 100 percent of welds;
- (b) Ultrasonic testing of 100 percent of full penetration sections of longitudinal seam welds and circumferential butt welds;
- (c) Magnetic particle testing of a random 10 percent of partial penetration sections of longitudinal seam welds;
- (d) Ultrasonic testing of 25 percent of base plate and flange plate welds; and
- (e) Inspection of hot-dip galvanizing and coating thickness.

E19.27.3 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;

E19.27.4 No repair shall be made until agreed to by the Contract Administrator; and The City of Winnipeg Specifications

E19.27.5 Defects in hot-dip galvanizing shall be rectified as directed by the Contract Administrator.

E19.28 Unacceptable Work

E19.28.1 Any Work found to be unacceptable shall be corrected in accordance with CSA W59; and

E19.28.2 No repair shall be made until agreed to by the Contract Administrator.

MEASUREMENT AND PAYMENT

E19.29 Overhead Sign Support Structure shall be measured on a unit basis and paid for at the Contract Unit Price for "Supply and Installation of Steel Overhead Sign Support Structures" in accordance with this Specification and accepted by the Contract Administrator.