THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 386-2016

2016 REGIONAL STREET RENEWAL PROGRAM - PEMBINA HIGHWAY SB & NB – GRANT AVENUE TO 100M EAST OF OSBORNE STREET – PAVEMENT REHABILITATION, RECONSTRUCTION AND BUFFERED BIKE LANES

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 2016 Regional Street Renewal Program - Pembina Highway SB & NB – Grant Avenue to 100m East of Osborne Street – Pavement Rehabilitation, Reconstruction and Buffered Bike Lanes

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, May 31, 2016.

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

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

B3. ENQUIRIES

B3.1 All enquiries shall be directed to the Contract Administrator identified in D3.1.

B3.2 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.

B3.3 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.

B3.4 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.

B3.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B3 unless that response or interpretation is provided by the Contract Administrator in writing.

B4. CONFIDENTIALITY

B4.1 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.

B4.2 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.

B5. ADDENDA

B5.1 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.

B5.2 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.

B5.2.1 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

B5.2.2 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.

B5.3 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.

B6. SUBSTITUTES

B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.

B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

B6.3 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.

B6.4 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.

B6.5 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.

B6.6 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.

B6.6.1 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.

B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B16.

B6.9 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.

B7. BID COMPONENTS

B7.1 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;

B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.

B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.

B7.4 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.

B7.4.1 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.

B7.4.2 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.

B7.5 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.

B7.6 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 B16.1(a).

B7.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B7.8 Bids shall be submitted to:

The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1

B8. BID

B8.1 The Bidder shall complete Form A: Bid, making all required entries.

B8.2 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.

B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.

B8.3 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.

B8.4 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.

B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B8.5 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.

B9. PRICES

B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B9.1.1 For the convenience of Bidders, and pursuant to B7.4.2 and B16.4.2, 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/

B9.2 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.

B9.3 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.

B9.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B10. DISCLOSURE

B10.1 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.

B10.2 The Persons are:

(a) N/A.

B11. QUALIFICATION

B11.1 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.

B11.2 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

B11.3 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);

B11.4 Further to B11.3(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) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or

(b) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or

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

B11.5 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.

B11.6 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.

B12. BID SECURITY

B12.1 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.

B12.1.1 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.

B12.1.2 All signatures on bid securities shall be original.

B12.1.3 The Bidder shall sign the Bid Bond.

B12.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

B12.2 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.

B12.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B12.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B12.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B12.3 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.

B13. OPENING OF BIDS AND RELEASE OF INFORMATION

B13.1 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.

B13.1.1 Bidders or their representatives may attend.

B13.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B12 will not be read out.

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

B13.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page

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

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

B14. IRREVOCABLE BID

B14.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.

B14.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work 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.

B15. WITHDRAWAL OF BIDS

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

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

B15.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

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

(a) retain the Bid until after the Submission Deadline has elapsed;

(b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and

(c) if the notice has been given by any one of the persons specified in B15.1.3(b), declare the Bid withdrawn.

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

B16. EVALUATION OF BIDS

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

(a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation therefrom (pass/fail);

(b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B11 (pass/fail);

(c) Total Bid Price;

(d) economic analysis of any approved alternative pursuant to B6.

B16.2 Further to B16.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other

irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

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

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

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

B16.4.2 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.

B17. AWARD OF CONTRACT

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

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

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

(a) the prices exceed the available City funds for the Work;

(b) the prices are materially in excess of the prices received for similar work in the past;

(c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;

(d) only one Bid is received; or

(e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

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

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

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 Widening
  (i) Pembina Highway southbound (Centre Median) – Jessie Avenue to Arbuthnot Street
  (ii) Pembina Highway northbound (Centre Median) – Weatherdon Avenue to Jessie Avenue

(b) Asphalt Resurfacing and Associated Works – Pavement Rehabilitation
  (i) Pembina Highway southbound – 100m East of Osborne Street to Arbuthnot Street
  (ii) Pembina Highway northbound – Weatherdon Avenue to Jessie Avenue
  (iii) Corydon Avenue – Nassau Street North to Pembina Highway

(c) Concrete Pavement Reconstruction
  (i) Pembina Highway northbound – Jessie Avenue to Osborne Street

(d) Bus Stop Improvements
  (i) Pembina Highway southbound – 100m East of Osborne Street to Arbuthnot Street
  (ii) Pembina Highway northbound – Weatherdon Avenue to Osborne Street

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

(a) Pavement Widening
  (i) Removal of existing concrete pavement, curb and precast sidewalk block splash strip;
  (ii) Excavation of boulevard;
  (iii) Removal of existing boulevard trees;
  (iv) Compaction of existing sub-grade;
  (v) Placement of separation geotextile fabric and/or geogrid;
  (vi) Placement and compaction of sub-base and base course material;
  (vii) Adjustment of existing centre median structures;
  (viii) Installation of catch pits/catch basins and drainage connection pipes;
  (ix) Construction of 200mm reinforced concrete pavement;
  (x) Construction of monolithic concrete splash strip utilizing slip form paver (150mm reveal height);
  (xi) Construction of modified barrier curb;
  (xii) Construction of safety median curb, concrete median slab, and monolithic concrete bullnose;
  (xiii) Boulevard restoration; and
  (xiv) Construction of asphalt overlay (average thickness 80mm).

(b) Asphalt Resurfacing and Associated Works – Pavement Rehabilitation
  (i) Planing of existing asphalt;
  (ii) Removal of existing curb, boulevard, and sidewalks;
  (iii) Removal of existing bullnose and median slabs;

(iv) Replacement/Installation of catch pits/catch basins and drainage connection pipes;
(v) CB lead repairs;
(vi) Abandonment of existing curb inlets and drainage connection pipes;
(vii) Full-depth concrete repairs of existing slabs and joints;
(viii) Adjustment of existing pavement and boulevard structures;
(ix) Construction of barrier and modified barrier curb;
(x) Construction of sidewalk with block-outs for paving stones;
(xi) Installation of paving stones;
(xii) Regrading of existing paving stones;
(xiii) Installation of detectable warning surface tiles;
(xiv) Construction of concrete median slab and monolithic concrete bullnose;
(xv) Installation of pavement repair fabric;
(xvi) Construction of asphalt overlay (average thickness 80mm); and
(xvii) Supply and installation of inlaid longitudinal lane line marking tape.

(c) Concrete Pavement Reconstruction
(i) Removal of existing concrete curb, splash strip and sidewalks;
(ii) Removal of existing concrete F-type traffic barrier and crash cushions;
(iii) Removal of existing overhead sign structures;
(iv) Removal of existing wooden posts and fencing;
(v) Relocation of fire hydrant;
(vi) Removal of existing concrete pavement;
(vii) Excavation of roadway and boulevard;
(viii) Removal of existing catch basins;
(ix) Installation of catch basins, drainage connection pipes and subdrains;
(x) Adjustment of existing pavement and boulevard structures;
(xi) Compaction of subgrade;
(xii) Placement of separation geotextile fabric and/or geogrid;
(xiii) Placement and compaction of sub base and base course material;
(xiv) Construction of 200mm reinforced concrete pavement;
(xv) Construction of barrier curb and safety median;
(xvi) Construction of concrete sidewalk with block-outs for paving stones;
(xvii) Construction of interlocking paving stone median;
(xviii) Installation of detectable warning surface tiles;
(xix) Installation of overhead sign structures;
(xx) Construction of asphalt overlay (average thickness 50mm); and
(xxi) Supply and installation of inlaid longitudinal lane line marking tape.

(d) Bus Stop Improvements
(i) Removal of existing curb and sidewalk;
(ii) Abandon existing cast-in-place concrete foundations;
(iii) Excavation of boulevard;
(iv) Placement and compaction of base course;
(v) Adjustment of existing boulevard structures;
(vi) Construction of cast-in-place Bus Stop Flag foundations;
(vii) Construction of sidewalk with block-outs for interlocking paving stones and asphalt;
(viii) Installation of directional bar tiles;
(ix) Installation of interlocking paving stones; and
(x) Placement of asphalt overlay (average thickness 50mm).

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is MMM Group Ltd., a WSP Company, represented by:

Rob Borody, P.Eng.
Manager – Infrastructure

Telephone No. 204 943-3178
Email Address BorodyR@mmm.ca

D3.2 At the pre-construction meeting, Rob Borody, P.Eng. 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 B7

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 B7.

D7. FURNISHING OF DOCUMENTS

D7.1 Upon award of the Contract, the Contractor will be provided with a digital copy of the complete Bid Opportunity.

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 B12.1(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; and
  (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 June 21, 2016

D14.4.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

D14.4.2 Commencement of the Work described in Phase II, Stages IV, V and VI as described in D17.1.4 is contingent upon the City acquiring property on the east side of Pembina Highway between Jessie Avenue and Osborne Street.

D15. RESTRICTED WORK HOURS

D15.1 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.

D16. WORK BY OTHERS

D16.1 Work by others on or near the Site will include but not necessarily be limited to:

(a) City of Winnipeg Transit
  (i) Remove and reinstall transit shelters, benches and Bus Stop Flags;

(b) City of Winnipeg Traffic Signals Branch
  (i) Installation of loops and signals plant;
  (ii) Removal and relocation of traffic signals;

(c) City of Winnipeg Traffic Services Branch
  (i) Traffic regulatory signage and transverse pavement markings;

(d) City of Winnipeg Water and Waste Department
  (i) 2016 Watermain renewal on Osborne Street between Corydon Avenue and Gertrude Avenue;

(ii) Remaining activities associated with 2015 watermain renewal on east side of Pembina Highway;

(e) City of Winnipeg Streets Maintenance
  (i) Salvaging and removal of ~200 precast concrete blocks from the median

(f) MTS
  (i) Adjusting or replacing existing MTS manhole frames;
  (ii) Existing vault restoration;

(g) Manitoba Hydro
  (i) Existing vault restoration;
  (ii) Adjusting Hydro manhole frames;
  (iii) Relocate street lighting as required.

(h) Xerox
  (i) Decommissioning and reinstallation of photo radar loops.

D17. SEQUENCE OF WORK

D17.1 Further to C6.1, the sequence of work shall be as follows:

D17.1.1 The Work shall be divided into 3 phases. Each Phase shall be subdivided into stages. Stages are further subdivided into major items of work.

D17.1.2 **Phase I** - Pembina Highway southbound from 100m east of Osborne Street to Arbuthnot Street

(a) **Stage I** – Median Lane and Left Turn Lanes Pavement Rehabilitation & Pavement Widening
  (i) Planing of asphalt and concrete where required;
  (ii) Removal of existing concrete pavement, curb and precast sidewalk block splash strip;
  (iii) Excavation of boulevard;
  (iv) Removal of boulevard trees;
  (v) Placement of separation geotextile fabric;
  (vi) Placement and compaction of sub-base and base course material;
  (vii) Construction of 200mm reinforced concrete pavement;
  (viii) Concrete pavement slab and joint repairs;
  (ix) Adjustments to pavement structures and appurtenances;
  (x) Construction of monolithic concrete splash strip;
  (xi) Curb and sidewalk renewals;
  (xii) Construction of safety median curb, concrete median slab, monolithic concrete bullnoses;
  (xiii) Construction of asphalt active transportation path crossing;
  (xiv) Installation of detectable warning surface tiles;
  (xv) Placing topsoil and finish grading and salt-tolerant grass seeding; and
  (xvi) Placing of scratch course asphalt;

(b) Placing the topsoil and finished grading of all boulevard and median areas shall be completed prior to commencing construction of the asphaltic concrete overlay, including the scratch course.

(c) **Stage II** – Centre Lane Pavement Rehabilitation
  (i) Planing of existing asphalt and concrete where required;
  (ii) Sewer service (CB lead) repair;
  (iii) Concrete pavement slab and joint repairs;

(iv) Adjustments to pavement structures and appurtenances; and
(v) Placing of scratch course asphalt;

(d) **Stage III** – Gutter Lane Pavement Rehabilitation & Bus Stop Improvements
(i) Planing of asphalt and concrete where required;
(ii) Removal of existing concrete pavement, curb and sidewalk;
(iii) Abandon flag foundation;
(iv) Excavation of boulevard;
(v) Concrete pavement slab and joint repairs;
(vi) Installation of catch pits/catch basins and drainage connection pipe;
(vii) CB lead repairs;
(viii) Adjustments to pavement structures and appurtenances;
(ix) Construction of bus stop flag foundation;
(x) Construction of barrier and modified barrier curbs;
(xi) Construction of sidewalk with block-outs for interlocking paving stones and asphalt;
(xii) Curb and sidewalk renewals;
(xiii) Construction of safety median, concrete median slab, monolithic concrete bullnoses;
(xiv) Installation of detectable warning surface tiles;
(xv) Installation of directional bar tiles;
(xvi) Installation of interlocking paving stones;
(xvii) Placing of scratch course asphalt; and
(xviii) Placing of active transportation path asphalt.

(e) **Stage IV** – All Lanes
(i) Placing final lift of asphalt on Stage I, Stage II and Stage III;
(ii) Placing asphalt on grade-separated two-way bike lane; and
(iii) Supply and installation of inlaid longitudinal lane line marking tape.

D17.1.3 Immediately following the completion of the asphaltic concrete works of Phase I, the Contractor shall clean up the Site and remove all plant, surplus material, waste and debris, other than that left by the City or other Contractors.

D17.1.4 **Phase II** – Pembina Highway Northbound – Weatherdon Avenue to 60m East of Osborne Street

(a) **Stage I** – Median Lane and Left Turn Lanes Pavement Rehabilitation & Pavement Widening
(i) Planing of asphalt and concrete where required;
(ii) Removal of existing concrete pavement, curb and precast sidewalk block splash strip;
(iii) Excavation of boulevard;
(iv) Sewer repairs;
(v) Placement of separation geotextile fabric;
(vi) Placement and compaction of sub-base and base course material;
(vii) Construction of 200mm reinforced concrete pavement;
(viii) Concrete pavement slab and joint repairs;
(ix) Adjustments to pavement structures and appurtenances;
(x) Construction of monolithic concrete splash strip;
(xi) Curb and sidewalk renewals;
(xii) Construction of safety median, concrete median slab, monolithic concrete bullnoses;

(xiii) Construction of asphalt AT path crossing;
(xiv) Installation of detectable warning surface tiles;
(xv) Placing topsoil and finish grading and salt-tolerant grass seeding; and
(xvi) Placing of scratch course asphalt;

(b) Placing the topsoil and finished grading of all boulevard and median areas shall be completed prior to commencing construction of the asphaltic concrete overlay, including the scratch course.

(c) **Stage II** – Centre Lane Pavement Rehabilitation
(i) Planing of existing asphalt and concrete where required;
(ii) Sewer service (CB lead) repair;
(iii) Concrete pavement slab and joint repairs;
(iv) Adjustments to pavement structures and appurtenances; and
(v) Placing of scratch course asphalt;

(d) **Stage III** – Gutter Lane Pavement Rehabilitation, Bus Stop Improvements & Active Transportation Path Construction
(i) Planing of asphalt and concrete where required;
(ii) Removal of existing concrete pavement, curb and sidewalk;
(iii) Abandon flag foundation;
(iv) Excavation of boulevard;
(v) Concrete pavement slab and joint repairs;
(vi) Installation of catch pits/catch basins and drainage connection pipe;
(vii) Sewer service (CB lead) repairs;
(viii) Adjustments to pavement structures and appurtenances;
(ix) Construction of bus stop flag foundation;
(x) Construction of barrier and modified barrier curb;
(xi) Construction of sidewalk with block-outs for interlocking paving stones and asphalt;
(xii) Curb and sidewalk renewals;
(xiii) Construction of safety median, concrete median slab, monolithic concrete bullnoses;
(xiv) Installation of detectable warning surface tiles;
(xv) Installation of directional bar tiles;
(xvi) Installation of interlocking paving stones;
(xvii) Placing of scratch course asphalt; and
(xviii) Placing of active transportation path asphalt.

(e) **Stage IV** – Median Lane – Jessie Avenue to Osborne Street Reconstruction
(i) Removal of existing concrete curb, splash strip and sidewalks;
(ii) Removal of existing overhead sign structures and crash cushions;
(iii) Removal of existing concrete pavement;
(iv) Excavation of roadway and boulevard;
(v) Removal of existing catch basins;
(vi) Installation of catch basins, drainage connection pipes and subdrains;
(vii) Adjustment of existing pavement and boulevard structures;
(viii) Compaction of subgrade;
(ix) Placement of separation geotextile fabric and/or geogrid;
(x) Placement and compaction of sub base and base course material; and
(xi) Construction of 200mm reinforced concrete pavement.

(f) **Stage V** – Gutter Lane – Jessie Avenue to Osborne Street Reconstruction
- (i) Removal of existing concrete curb and sidewalks;
- (ii) Relocation of fire hydrant;
- (iii) Removal of existing concrete pavement;
- (iv) Excavation of roadway and boulevard;
- (v) Removal of existing catch basins;
- (vi) Installation of catch basins, drainage connection pipes and subdrains;
- (vii) Adjustment of existing pavement and boulevard structures;
- (viii) Compaction of subgrade;
- (ix) Placement of separation geotextile fabric and/or geogrid;
- (x) Placement and compaction of sub base and base course material;
- (xi) Construction of 200mm reinforced concrete pavement;
- (xii) Construction of barrier curb and safety curb;
- (xiii) Construction of concrete sidewalk with block-outs for paving stones; and
- (xiv) Installation of paving stones.

(g) **Stage VI** – Centre Lane – Jessie Avenue to Osborne Street Reconstruction
- (i) Removal of existing concrete curb, splash strip and sidewalks;
- (ii) Removal of existing concrete F-type traffic barrier and crash cushion;
- (iii) Removal of existing concrete pavement;
- (iv) Excavation of roadway and boulevard;
- (v) Installation of catch basins, drainage connection pipes and subdrains;
- (vi) Adjustment of existing pavement structures;
- (vii) Compaction of subgrade;
- (viii) Placement of separation geotextile fabric and/or geogrid;
- (ix) Placement and compaction of sub base and base course material;
- (x) Construction of 200mm reinforced concrete pavement;
- (xi) Construction of barrier curb and safety safety;
- (xii) Construction of concrete sidewalk;
- (xiii) Construction of interlocking paving stone median; and
- (xiv) Installation of overhead sign structures.

(h) **Stage VII** – All Lanes
- (i) Placing final lift of asphalt on Stages I-VI;
- (ii) Placing asphalt on grade-separated two-way bike lane; and
- (iii) Supply and installation of inlaid longitudinal lane line marking tape.

D17.1.5 Immediately following the completion of the asphaltic concrete works of Phase II, the Contractor shall clean up the Site and remove all plant, surplus material, waste and debris, other than that left by the City or other Contractors.

D17.1.6 **Phase III** – Corydon Avenue – Nassau Street N to Osborne Street

(a) **Stage I** – Gutter Lanes Eastbound and Westbound
- (i) Planing of existing asphalt;
- (ii) Removal of existing curb, boulevard, and sidewalks;
- (iii) Replacement/Installation of catch pits/catch basins and drainage connection pipes;
- (iv) CB lead repairs;
- (v) Abandonment of existing curb inlets and drainage connection pipes;
- (vi) Full-depth concrete repairs of existing slabs and joints;
- (vii) Adjustment of existing pavement and boulevard structures;

(viii) Construction of barrier and modified barrier curb;
(ix) Construction of sidewalk with block-outs for paving stones;
(x) Installation of paving stones;
(xi) Installation of detectable warning surface tiles; and
(xii) Construction of asphalt overlay (average thickness 80mm).

(b) **Stage II** – Centre Lanes Eastbound and Westbound
(i) Planing of existing asphalt;
(ii) Removal of existing bullnose and median slabs;
(iii) Full-depth concrete repairs of existing slabs and joints;
(iv) Adjustment of existing pavement structures;
(v) Construction of monolithic curb and sidewalk with block-outs for paving stones; and
(vi) Construction of asphalt overlay (average thickness 80mm).

D18. CRITICAL STAGES

D18.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:

(a) Complete all Phase I construction activities as specified in D17.1.2 by November 4, 2016

D18.2 When the Contractor considers the Work associated with D18.1(a) to be completed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Completion. 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.

D18.3 The date on which the D18.1(a). Work has been accepted by the Contract Administrator as being completed to the requirements of the Contract is the date on which completion of D18.1(a) has been achieved.

D19. SUBSTANTIAL PERFORMANCE

D19.1 The Contractor shall achieve Substantial Performance by October 13, 2017.

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 by October 27, 2017.

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 Critical Stages, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:

(a) Critical Stage D18.1(a) – Three thousand dollars ($3,000.00);

(b) Substantial Performance – Three thousand five hundred dollars ($3,500.00);

(c) Total Performance – Three thousand five hundred dollars ($3,500.00).

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 critical stages, 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) Sodding maintenance as specified in CW 3510-R9;

(b) Seeding maintenance as specified in CW 3520-R7; and

(c) Reflective crack maintenance as specified in CW 3250-R7.

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 B11.4, 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 B11.4.

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 Substantial Performance and shall expire one (1) years thereafter for pavement rehabilitation works , and two (2) years thereafter for pavement reconstruction works, unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

D27.2 Notwithstanding C13.2 or D27.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Substantial Performance if:

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

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. 386-2016

2016 Regional Street Renewal Program - Pembina Highway SB & NB – Grant Avenue to 100m East of Osborne Street – Pavement Rehabilitation, Reconstruction and Buffered Bike Lanes
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. 386-2016

2016 Regional Street Renewal Program - Pembina Highway SB & NB – Grant Avenue to 100m East of Osborne Street – Pavement Rehabilitation, Reconstruction and Buffered Bike Lanes

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)

FORM J: SUBCONTRACTOR LIST
(See D12)

2016 Regional Street Renewal Program - Pembina Highway SB & NB – Grant Avenue to 100m East of Osborne Street – Pavement Rehabilitation, Reconstruction and Buffered Bike Lanes

Portion of the Work	Name	Address
SUPPLY OF MATERIALS:		
Surface Works:		
Geotextile/Geogrid Fabrics		
Pavement Repair Fabric		
Sub-base and Base Course Material		
Concrete		
Asphalt		
Topsoil, Salt Tolerant Grass Seed, and Sod		
Interlocking Paving Stones		
Inlaid Longitudinal Lane Line Marking Tape		
Directional Bar Tiles		
Detectable Warning Tiles		
Black Granite Mulch		
W-Beam Guardrail		
Sign Structures		
Underground Works:		
Pre-cast Concrete Catch Pits/Catch Basins/Risers		
Sewer/Drainage Connection/Sewer Service Pipes		
Manhole Frames, Covers, Boxes and Lifter Rings		
Watermain Valve Boxes/Service Boxes		
Fire Hydrant		
Sub Drains		

FORM J: SUBCONTRACTOR LIST
(See D12)

2016 Regional Street Renewal Program - Pembina Highway SB & NB – Grant Avenue to 100m East of Osborne Street – Pavement Rehabilitation, Reconstruction and Buffered Bike Lanes

Portion of the Work	Name	Address
INSTALLATION AND PLACEMENT:		
Surface Works:		
Geotextile/Geogrid Fabrics		
Pavement Repair Fabric		
Sub-base and Base Course Material		
Concrete		
Asphalt		
Topsoil, Salt Tolerant Grass Seed, and Sod		
Interlocking Paving Stones		
Joint Sealant		
Inlaid Longitudinal Lane Line Marking Tape		
Directional Bar Tiles		
Detectable Warning Tiles		
Black Granite Mulch		
W-Beam Guardrail		
Sign Structures		
Bus Stop Flag Foundation		
Underground Works:		
Pre-cast Concrete Catch Pits/Catch Basins/Risers		
Sewer/Drainage Connection/Sewer Service Pipes		
Manhole Frames, Covers, Boxes and Lifter Rings		
Watermain Valve Boxes/Service Boxes		
Fire Hydrant		
Sub Drains		

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:

Drawing No.	Drawing Name/Title	Drawing (Original) Sheet Size
	Cover Sheet	A1
5516006-C-01	Pembina Highway – Southbound Limit of Construction to STA. 1+053	A1
5516006-C-02	Pembina Highway – Southbound STA. 1+053 to STA 1+173	A1
5516006-C-03	Pembina Highway – Southbound STA. 1+173 to STA 1+313	A1
5516006-C-04	Pembina Highway – Southbound STA. 1+313 to STA 1+443	A1
5516006-C-05	Pembina Highway – Southbound STA. 1+443 to STA 1+583	A1
5516006-C-06	Pembina Highway – Southbound STA. 1+583 to STA 1+723	A1
5516006-C-07	Pembina Highway – Southbound STA. 1+723 to STA 1+873	A1
5516006-C-08	Pembina Highway – Southbound STA. 1+873 to STA 2+014	A1
5516006-C-09	Pembina Highway – Southbound STA. 2+014 to STA 2+154	A1
5516006-C-10	Pembina Highway – Southbound STA. 2+154 to STA 2+294	A1
5516006-C-11	Pembina Highway – Southbound STA. 2+294 to STA 2+444	A1
5516006-C-12	Pembina Highway – Southbound STA. 2+444 to STA 2+583	A1
5516006-C-13	Pembina Highway – Northbound STA. 6+100 to STA 6+234	A1
5516006-C-14	Pembina Highway – Northbound STA. 6+234 to Limit of Construction	A1
5516006-C-15	Corydon Avenue – Limit of Construction to STA. 2+30	A1
5516006-C-16	Corydon Avenue – STA. 2+30 to STA. 3+10	A1
5516006-C-17	Intersection of Pembina Highway, Osborne Street and Corydon Avenue	A1
5516006-C-18	Staging Plan	A1
5516006-C-19	Inlaid Longitudinal Lane Line Markings	A1
5516006-C-20	Typical Cross Section and Details	A1
5516006-C-21	Guardrail Details	A1
5516006-S-01	S778 – Pembina Highway North of Jessie Avenue	A1
5516006-S-02	S778 – Fabrication Details (1 of 2)	A1
5516006-S-03	S778 – Fabrication Details (2 of 2)	A1
5516006-S-04	S779 – Pembina Highway at Osborne Street	A1
5516006-S-05	S779 – Fabrication Details (1 of 2)	A1
5516006-S-06	S779 – Fabrication Details (2 of 2)	A1

E2. GEOTECHNICAL REPORT

E2.1 Further to C3.1, the geotechnical report is provided to aid the Contractor's evaluation of the pavement structure and/or existing soil conditions. The geotechnical report is contained in Appendix 'A'.

E3. OFFICE FACILITIES

E3.1 The Contractor shall supply office facilities meeting the following requirements:

(a) The field office shall be for the exclusive use of the Contract Administrator.

(b) The building shall be conveniently located near the site of the Work.

(c) The building shall have a minimum floor area of 25 square metres, a height of 2.4m with two windows for cross ventilation and a door entrance with a suitable lock.

(d) The building shall be suitable for all weather use. It shall be equipped with an electric heater and air conditioner so that the room temperature can be maintained between either 16-18^{o}C or 24-25^{o}C.

(e) The building shall be adequately lighted with fluorescent fixtures and have a minimum of three wall outlets.

(f) The building shall be furnished with one desk, one drafting table 3m x 1.2m, one stool and a minimum of 8 chairs.

(g) A portable toilet shall be located near the field office building. The toilet shall have a locking door and be for the exclusive use of the Contract Administrator and other personnel from the City.

(h) The field office building and the portable toilet shall be cleaned on a weekly basis immediately prior to each site meeting. The Contract Administrator may request additional cleaning when he/she deems it necessary.

E3.2 The Contractor shall be responsible for all installation and removal costs, all operating costs, and the general maintenance of the office facilities.

E3.3 The office facilities will be provided from the date of the commencement of the Work to the date of Substantial Performance.

E3.4 On a one time basis, where directed by the Contract Administrator, the Contractor shall relocate the office facilities to a location more convenient for the remaining Work.

E4. PROTECTION OF EXISTING TREES

E4.1 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.

E4.2 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.

E4.3 No separate measurement or payment will be made for the protection of trees.

E4.4 Except as required in clause E4.1(c) and E4.1(e), Elm trees shall not be pruned at any time between April 1 and July 31.

E5. TRAFFIC CONTROL

E5.1 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.

E5.2 Notwithstanding E5.1, 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.

E5.2.1 An exception to E5.2 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.

E5.2.2 Further to E5.2, 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.

E6. TRAFFIC MANAGEMENT

E6.1 Further to clause 3.7 of CW 1130:

E6.1.1 Maintain a minimum of two lanes of traffic southbound on Pembina Highway (Phase I) and two lanes of traffic northbound on Pembina Highway (Phase II) during their respective construction times, including during paving and milling operations. When no work is being performed on site, non-essential lane closures will not be permitted.

E6.1.2 Only one lane of traffic southbound on McMillan Avenue may be closed at a time to facilitate construction activity. When no work is being performed on site, non-essential lane closures will not be permitted.

E6.1.3 No lane closures of northbound traffic on Pembina Highway will be permitted during Phase I and no lane closures of southbound traffic on Pembina Highway will be permitted during Phase II, without the written permission of the Contract Administrator.

E6.1.4 Where left turn lanes exist, an additional lane to accommodate the left turn storage lane shall be maintained at all times, unless otherwise indicated by the Contract Administrator.

E6.1.5 Maintain a minimum of one lane of traffic eastbound and one lane of traffic westbound on Corydon Avenue (Phase III) including during paving and milling operations. When no work is being performed on site, non-essential lane closures will not be permitted.

E6.1.6 Northbound and southbound traffic along Osborne Street must be maintained during construction to allow for one lane of traffic in each direction during Phase II, Stage V. No lane closures on Osborne Street will be permitted during any other phase of construction. When no work is being performed on site and providing it is safe for vehicles, non-essential lane closures will not be permitted.

E6.1.7 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.

E6.1.8 Maintain a minimum of two lanes of traffic northbound on Osborne Street during the morning peak period (7:00 – 9:00) and two lanes of traffic southbound on Osborne Street during the afternoon peak period (15:30 – 17:30), including during paving and milling operations. When no work is being performed on site, non-essential lane closures will not be permitted.

E6.1.9 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.

E6.1.10 Pedestrian access must be maintained on one side of each street at all times.

E6.1.11 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.

E6.1.12 Access from the Transit only lanes between northbound and southbound Pembina Highway (Confusion Corner) must be maintained at all times to allow for Transit movements onto the open lanes of southbound Pembina Highway. No closures will be permitted during any phase of construction, without the written permission of the Contract Administrator in conjunction with Winnipeg Transit

E6.1.13 Flag persons may be necessary to maintain the flow of traffic during certain work operations.

E6.1.14 Ambulance/emergency vehicle access must be maintained at all times.

E7. PEDESTRIAN SAFETY

E7.1 During the project, the Contractor shall ensure the proper signage is in place during the sidewalk construction to direct any pedestrians within the construction zone either around the construction or to the sidewalk on the opposite side of the street. The Contractor must also use proper signage, barricades and temporary fencing to protect and keep pedestrians safely away from the construction area and open excavations to the satisfaction of the Contract Administrator. No measurement for payment shall be made for this work.

E8. WATER OBTAINED FROM THE CITY

E8.1 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.

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. INFRASTRUCTURE SIGNS

E10.1 The Contractor shall obtain infrastructure signs from the Traffic Services Sign Shop at 421 Osborne Street. The Contractor shall mount each sign securely to a rigid backing material approved by the Contract Administrator. The Contractor shall fasten each sign to a suitable support and erect and maintain one sign at each street as directed by the Contract Administrator. When the Contract Administrator considers the Work on the street complete, the Contractor shall remove and dispose of the signs and supports. No measurement for payment will be made for performing all operations herein described and all other items incidental to the work described

E11. SUPPLY AND INSTALLATION OF PAVEMENT REPAIR FABRIC

DESCRIPTION

E11.1 General

E11.1.1 This specification covers the supply and installation of pavement repair fabric.

E11.1.2 Referenced Standard Construction

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

MATERIALS

E11.2 Storage and Handling

E11.2.1 Store and handle material in accordance with Section 2 of CW 3130.

E11.3 Pavement Repair Fabric

E11.3.1 Pavement repair fabric will be Glas Grid Road Reinforcement Mesh - Style 8501 or approved equal.

CONSTRUCTION METHODS

E11.4 General

E11.4.1 Install pavement repair fabric at various locations as directed by the Contract Administrator.

E11.4.2 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.

E11.4.3 Proceed with installation upon completion and acceptance of the asphalt levelling course.

E11.4.4 Install fabric in accordance with the manufacturer's specifications and recommendations.

E11.4.5 Only construction equipment required to place the final asphalt surface course will be allowed to travel on the exposed fabric.

E11.4.6 Replace damaged or improperly placed fabric.

E11.4.7 Ensure temperature of the asphalt material does not exceed the melting point of the fabric.

MEASUREMENT AND PAYMENT

E11.5 Pavement Repair Fabric

E11.5.1 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.

E12. PARTIAL DEPTH PATCHING OF EXISTING JOINTS

DESCRIPTION

E12.1 General

E12.1.1 This specification covers the Partial Depth Patching of existing concrete pavement joints.

E12.2 Referenced Standard Construction Specifications

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

(b) CW 3410 – Asphalt Concrete Pavement Works

MATERIALS

E12.3 Asphalt Materials

E12.3.1 Asphalt material will be Type 1A supplied in accordance with Sections 5 and 6 of CW 3410.

E12.4 Tack Coat

E12.4.1 Tack Coat will be undiluted SS-1 emulsified asphalt or approval equal.

CONSTRUCTION METHODS

E12.5 Planing of Joints

E12.5.1 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.

E12.5.2 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

E12.5.3 Dispose of material in accordance with Section 3.4 of CW 1130.

E12.6 Placement of Asphalt Material

E12.6.1 Prior to placement of asphalt material, the planed joint shall be swept or blow clean of any loose material.

E12.6.2 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.

E12.6.3 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.

E12.6.4 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 %.

E12.6.5 Ensure that no traffic is allowed to travel over the patched area until the asphalt has cooled to atmospheric temperature.

MEASUREMENT AND PAYMENT

E12.7 Partial Depth Planing of Existing Joints

E12.7.1 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.

E12.8 Asphalt Patching of Partial Depth Joints

E12.9 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.

E13. SALT TOLERANT GRASS SEEDING

DESCRIPTION

E13.1 Further to CW 3520 and CW3540, this specification shall cover sub-grade preparation and the supply and placement of Salt Tolerant Grass Seed.

MATERIALS

E13.2 Salt Tolerant Grass Seed

E13.2.1 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

E13.3 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

E13.4 Preparation of Existing Grade

E13.4.1 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.

E13.4.2 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).

E13.5 Salt Tolerant Grass Seeding

E13.5.1 Salt Tolerant Grass Seed shall be sown at a rate of 2.2 kilograms per 100 square meters.

MEASUREMENT AND PAYMENT

E13.6 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.

E14. TREE REMOVAL

E14.1 Further to CW 3010 – Clearing and Grubbing, tree removal including the roots shall be measured on a unit basis for the number of trees removed in accordance with CW 3010. Payment shall be at the Contract Unit Price bid for “Tree Removal” measured as specified herein for the total number of trees removed in accordance with this Specification, accepted and measured by the Contract Administrator.

E15. BLACK GRANITE MULCH

GENERAL

E15.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation black granite mulch.

MATERIALS

E15.2 Black granite mulch in accordance with Trees, Shrubs & Groundcover Plantings specification.

E15.3 CONSTRUCTION METHODS

E15.4 Ensure that finished soil level is 75mm below finished grade of sidewalk at trees to accommodate placement of 75mm of black granite mulch to level of finished sidewalk grade.

E15.5 MEASUREMENT AND PAYMENT

E15.6 Supply, placement and maintenance of Black Granite Mulch will be paid for at the Contract Unit Price per square metre for "Black Granite Mulch", 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.

E16. 100 MM CONCRETE SIDEWALK WITH BLOCK-OUTS FOR INTERLOCKING PAVING STONES

GENERAL

E16.1 Further to Specification CW 3325 the Contractor shall construct the proposed 100mm Concrete Sidewalk with Block-outs for Interlocking Paving Stones with a minimum 100mm depth of concrete below pavers. The “block-outs” shall be constructed utilizing forming techniques capable of accommodating the proposed paving stones to the dimensions and tolerances as confirmed with interlocking paving stone manufacturer.

E16.2 A 50mm levelling course of Base Course Material will be used for the 100mm Concrete Sidewalk with Block-outs for Interlocking Paving Stones.

E16.3 The concrete sidewalk shall be poured such that the “block-outs” and remaining sidewalk act as a monolithic section.

E16.4 All costs in connection with the additional forming and placement of concrete as a result of the “block-outs”, shall be included in the Contract Unit Price for 100mm Concrete Sidewalk with Block-outs for Interlocking Paving Stones.

E16.5 Where concrete sidewalk is to be poured up to adjacent buildings, an approved bond breaker shall be supplied and installed from the base of the concrete slab up to the concrete surface. Cost of the bond breaker shall be included in the Contract Unit Price for Concrete Sidewalk with Block-outs for Interlocking Paving Stones.

E16.6 Further to Specification CW 3110, the Contractor must use Granular Base Course material for all sidewalk installations and renewals within 5 m of existing boulevard trees. No limestone or crushed concrete base course material will be permitted when constructing sidewalk within 5 m of existing boulevard trees as directed and approved by the Contract Administrator.

MEASUREMENT AND PAYMENT

E16.7 Construction of 100mm Concrete Sidewalk with Block-outs for Interlocking Paving Stones will be measured on an area basis and paid for at the Contract Unit Price per square metre for “100mm Concrete Sidewalk with Block-outs for Interlocking Paving Stones”. The area to be paid for will be the total number of square metres constructed of 100mm Concrete Sidewalk with Block-outs for Interlocking Paving Stones in accordance with this Specification, accepted and measured by the Contract administrator.

E16.8 The supply, placement and compaction of Base Course Material for 100mm Concrete Sidewalk with Block-outs for Interlocking Paving Stones shall be included in the cost of 100mm Concrete Sidewalk with Block-outs for Interlocking Paving Stones and no separate measurement and payment will be made

E17. UNIT PAVER INSERT FOR BUS STOP AND SIDEWALK

DESCRIPTION

E17.1 Further to CW 3330 this Specification shall cover the:

(a) Supply and installation of interlocking paving stones (unit pavers),

(b) Supply and installation of sand setting bed,

(c) Supply and installation of grout.

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

MATERIALS

E17.3 Concrete interlocking paving stones (unit pavers) shall be installed as shown on the Drawings and as follows:

E17.3.1 Holland Stone

(a) Blue Holland Stone 105 x 210 x 60mm,

(b) Charcoal Holland Stone 105 x 210 x 60mm, and

(c) Mahogany Holland Stone 105 x 210 x 60mm.

E17.3.2 Beldin Regimental Pavers

(a) Regimental Red Brick (57mm thick) – colour: Red.

E17.3.3 Roman Pavers

(a) Edge, Soldier Course - Natural Grey colour, and

(b) Inside, Random Pattern 1 - Sierra Grey colour.

E17.4 Sand:

(a) Clean brick sand as joint filler,

(b) Clean brick sand as minimum 13mm depth setting bed.

E17.5 Grout:

(a) Grout as specified hereinafter shall be used for grouting paving stone and brick in areas indicated on the drawings. The grout shall have a compressive strength of 25 MPA at 28 days, determined on 50 mm cubes stored and tested in accordance with ASTM C109, and shall consist of normal Portland cement, sand and water.

(b) The water-cement ratio shall be kept in the range of 0.45 to 0.55.

(c) The grout shall have between 3% and 5% entrained air.

(d) Acryl-Stik or approved equal to be used in grout at approximately 4 litres Acryl-Stik to 3 litres water.

(e) Admixtures to be used in the grout shall be supplied in accordance with the requirements of the City of Winnipeg Standard CW 3310.

(f) The grout shall be of a consistency suitable for the application intended as approved by the Contract Administrator.

(g) The Contractor shall provide the Contract Administrator with a mix design statement certifying the constituent materials and mix proportions that will be used in the grout for approval prior to construction.

CONSTRUCTION METHODS

E17.6 Interlocking paving stones shall be installed in block out in concrete sidewalk or on granular base as per the Drawings.

E17.7 If cutting of existing concrete sidewalk is required, this shall be incidental to the pay item described in this specification.

E17.8 Install sand setting bed for pavers on granular base as shown on the Drawings.

E17.9 Contractor to verify the exact dimensions of pavers and panels prior to construction of block outs in concrete sidewalk.

E17.9.1 Install concrete sidewalk as specified on Drawings.

E17.9.2 Install sand bed to minimum 13mm depth as specified on Drawings. Adjust depth of pavers under areas to be re-levelled to ensure surface of pavers is flush with adjacent paving.

E17.9.3 Do not compact setting bed prior to installation of pavers.

E17.9.4 Spread only sufficient area which can be covered with pavers same day.

E17.9.5 Lay pavers on sand bed hand tight.

E17.9.6 Install Roman pavers in a single soldier course pattern around the perimeter and inside edges of curbs and concrete sidewalks, as shown on the Construction Drawings.

E17.9.7 Install Roman pavers inside the soldier course perimeter in Barkman Concrete Ltd. “Random Pattern 1”.

E17.9.8 In areas where pavers are to be grouted in place clean existing concrete, install grout bed and then place pavers on grout.

E17.9.9 Grout between pavers as required ensuring stability.

E17.9.10 Remove adjacent pavers in bands as required to ensure that bricks do not require cutting on straight bands.

E17.9.11 Where paving pattern is interrupted by vertical structural elements pavers must be sawcut and fit true and hand tight.

E17.9.12 Commence installation of pavers against edge to obtain straightest possible course for installation.

E17.9.13 Pavers shall be cut with a saw only, to obtain true even undamaged edges. Chipped pavers are unacceptable.

E17.9.14 Crews shall Work on installed pavers, not on sand layer.

E17.9.15 Spread and fine grade brick sand over paving surface and sweep into joints, in several directions. Sand is incidental to the price for supply and installation of pavers.

E17.9.16 Compact all pavers with vibratory plate compactor having mass of at least 113kg.

E17.9.17 Compaction is incidental to the price for supply and installation of paving stone.

E17.9.18 Sweep remaining sand over all paving areas and remove from Site.

E17.9.19 Replace at no extra cost all whole or cut stones marked as unacceptable.

E17.9.20 Remove cracked, chipped, broken or otherwise damaged paving materials from Site immediately.

E17.9.21 Upon completion, clean in accordance with manufacturer's recommendations.

MEASUREMENT AND PAYMENT

E17.10 Measurement and payment for the supply and installation of “Interlocking Paving Stones” shall be as per City of Winnipeg Specification CW 3330.

E18. SUPPLY AND INSTALL DIRECTIONAL BAR TILES

DESCRIPTION

E18.1 This specification covers the supply and installation of directional bar tiles in 100mm concrete sidewalks.

SPECIFICATIONS

E18.2 Referenced Standard Construction Specifications and Standard Details

(a) CW 3235 - Renewal of Existing Miscellaneous Concrete Slabs

(b) CW 3310 - Portland Cement Concrete Pavement Works

(c) CW 3325 - Portland Cement Concrete Sidewalk

MATERIALS

E18.3 Acceptable Directional Bar Tile product is:

(a) 305mm x 610mm Cast in Place (Wet Set) with Anchors – Manufactured by ADA Solutions

(i) Part # 1224BAR375Y

(ii) Flush Mount, Federal Yellow

(iii) Fasteners: 6mm Dia. x 38mm Long SS FH Bolts (Hex Drive) and 6mm Dia. x 38mm Long Zinc Inserts.

(iv) Sealant: Manufacturer recommended

INSTALLATION INSTRUCTIONS

E18.4 Installation Instructions for Directional Bar Tiles

(a) Install Wet Set Replaceable units as per manufacturer's recommendations, and as shown on contract drawings.

(b) Refer to Section 03 33 00 Cast In Place Concrete

(c) Where necessary, cut Wet Set Replaceable units accurately using a 60 tooth carbide or diamond blade with a suitable cutting device. No cut unit shall measure less than 250mm in length. In accordance with manufacturer's recommendations, supplemental fasteners and Inserts shall be added as needed when the distance between the cut face of the unit and the original hardware exceeds 100mm.

(d) Install Wet Set Replaceable units true to grade, in location, layout and pattern as indicated on the contract drawings.

(e) Wet Set Replaceable units shall be set flush into a minimum 65mm depth of concrete (100mm-175mm slump). Vibrate or tamp (with a rubber mallet) the Wet Set Replaceable units into the fresh concrete to insure that there are no voids underlying the units and that the units are flush with the adjacent substrate. Temporary weights can be added as necessary in the event of float during initial set of the units.

(f) Joint Lines between successive Wet Set Replaceable Units: Maintain a 3mm-5mm consistent joint line between successive units.

(g) Tooled Edge Detail: Maintain a 3mm to 6mm tooled edge detail along the perimeter of the Wet Set Replaceable unit installation. Installation of the tooled edge detail facilitates future removal and replacement of the units.

(h) Sealant: Fill all Joints and Tooled Edge Details with Sikaflex 1A, BASF NP1, or Tremco Dynomic Sealant in the color(s) indicated on the contract drawings. Sealant renders the installation water resistant and provides for a pleasing architectural finish.

(i) Protective Plastic Sheet: Particularly in direct sunlight and when temperatures exceed 25 degrees C, remove the protective plastic sheeting from the Wet Set Replaceable units within 48 hours of installation of the unit. Failure to do so will be solely at Contractor risk and may result in the protective plastic bonding to the unit thus requiring a considerable effort to remove the protective plastic sheeting.

MEASUREMENT AND PAYMENT

E18.5 Directional Bar Tiles

E18.5.1 Directional Bar Tiles shall be measured on a unit basis and paid for at the Contract Unit Price per unit for the "Items of Work" listed here below. The number of units to be paid for shall be the total number of Directional Bar Tiles supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

Directional Bar Tiles

(i) 305 mm x 610 mm tiles

E19. CAST-IN-PLACE CONCRETE FOUNDATIONS

E19.1 Description

(a) The Work covered under this Item shall include all concreting operations related to construction of cast-in-place concrete foundations in accordance with this Specification and as shown on the Drawings.

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

E19.2 Materials

E19.2.1 General

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

E19.2.2 Handling and Storage of Materials

(a) All materials shall be handled and stored in a careful and workmanlike manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with CSA Standard A23.1-04.

E19.2.3 Testing and Approval

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

(b) All materials shall be approved by the Contract Administrator at least seven (7) 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.

E19.2.4 Patching Mortar

(a) 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.

E19.2.5 Cement

(a) Cement shall be Type HS or HSb, high-sulphate-resistant hydraulic cement, conforming to the requirements of CSA Standard A23.1-04.

E19.2.6 Concrete

(a) General

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

(b) 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 A23.1-04:

(i) Class of Exposure: S-1

(ii) Compressive Strength @ 56 days = 35 MPa

(iii) Water / Cementing Materials Ratio = 0.4

(iv) Air Content: Category 2 per Table 4 of CSA A23.1-04 (4-7%)

(v) Cement – shall be as specified in E13.2.5

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

(d) The workability of each concrete mix shall be consistent with the Contractor's placement operations. Self compacting concrete may be used for the foundations.

(e) 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.

(f) 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.

(g) Concrete materials susceptible to frost damage shall be protected from freezing.

E19.2.7 Aggregate

(a) 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.

(b) Coarse Aggregate

(i) 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".

(ii) 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%.

(iii) 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.

(iv) Coarse aggregate when tested for abrasion in accordance with ASTM C131 shall not have a loss greater than 30%.

(v) Tests of the coarse aggregate shall not exceed the limits for standard for requirements prescribed in CSA A23.1, Table 12, for concrete exposed to freezing and thawing.

(c) Fine Aggregate

(i) Fine aggregate shall meet the grading requirements of CSA A23.1, Table 10, Gradation FA1.

(ii) 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.

(iii) Tests of the fine aggregate shall not exceed the limits for standard requirements prescribed in CSA A23.1, Table 12.

E19.2.8 Cementing Materials

(a) Cementing materials shall conform to the requirements of CSA A3001.

(b) Silica Fume

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

(c) Fly Ash

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

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

E19.2.9 Admixtures

(a) Air entraining admixtures shall conform to the requirements of ASTM C260.

(b) Chemical admixtures shall conform to the requirements of ASTM C494 or C1017 for flowing concrete.

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

(d) 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.

(e) 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.

E19.2.10 E13.2.10 Water

(a) 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.

E19.2.11 Concrete Supply

(a) 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.

(b) 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.

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

E19.2.12 Reinforcing Steel

(a) Reinforcing steel shall be deemed to include all reinforcing bars, tie-bars, and dowels.

(b) 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 Standard A767 for a minimum net retention of 600 g/m^2. Reinforcing steel supply and installation will be incidental to construction of concrete foundation and no separate payment will be made.

E19.2.13 Anchor Bolts, Nuts, and Washers

(a) Anchor bolts, nuts, and washers shall be supplied by the Contract Administrator.

(b) Anchor bolt supply and installation will be incidental to construction of concrete foundation and no separate payment will be made.

(c) Anchor bolts shall be ASTM F1554 Gr. 55.

E19.2.14 Anchor Bolt Templates

(a) Anchor bolt templates shall be supplied by the Contract Administrator.

(b) Anchor bolt templates will be incidental to construction of new concrete foundation and no separate payment will be made.

E19.2.15 Fibre Joint Filler

(a) Fibre joint filler shall be rot-proof and of the preformed, non-extruding, resilient-type, made with a bituminous fibre such as “Flexcell,” and shall conform to the requirements of ASTM Standard D1751, or approved equal in accordance with B6.

E19.2.16 Anti-Graffiti Coating

(a) Anti-graffiti coating shall be “Professional Water Sealant & Anti-Graffiti System” or approved equivalent by Contract Administrator.

E19.2.17 Waterproofing Membrane

(a) Waterproofing membrane shall be “Sonoshield HLM 5000 R” or approved equivalent by the Contract Administrator.

E19.2.18 Miscellaneous Materials

(a) Miscellaneous materials shall be of the type specified on the Drawings or approved by the Contract Administrator.

E19.3 Construction Methods

E19.3.1 Location and Alignment of Foundations

(a) Foundation construction shall not commence until the Contractor has obtained clearance from the appropriate Utility Authorities.

(b) Foundations shall be placed in the positions shown on the Drawings and as directed by the Contract Administrator in the field.

(c) The deviation of the axis of any finished foundation shall not differ by more than 1 percent from the vertical.

E19.3.2 Buried Utilities

(a) The Contractor shall exercise extreme caution when constructing the 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 foundations.

(b) The proposed locations of the foundations may be changed by the Contract Administrator if they interfere with the buried utilities.

(c) 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 foundations, as determined by the Contract Administrator.

E19.3.3 Excavation

(a) The Contractor is responsible for determining the excavation method at each foundation location.

(b) Excavations for foundations 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.

(c) Upon reaching the required elevation, the bottom of the excavation shall be cleaned as directed by the Contract Administrator in the field.

(d) All excavated material from the foundations shall be promptly hauled away from the Site to an approved disposal area as located by the Contractor.

(e) 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.

E19.3.4 Sleeving

(a) Timber or steel 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.

(b) The sleeving shall be designed by the Contractor and constructed to resist all forces that may tend to distort it.

(c) 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.

(d) The clearance between the face of the bore hole and the sleeving shall not exceed 75 mm.

E19.3.5 Inspection of Bores

(a) Concrete shall not be placed in a bore until the bore has been inspected and approved by the Contract Administrator.

(b) The Contractor shall have available suitable light for the inspection of each bore throughout its entire length.

(c) All improperly set sleeving, bore, or bottom shall be corrected to the satisfaction of the Contract Administrator.

E19.3.6 Placing Reinforcing Steel

(a) Reinforcement shall be:

(i) Placed in accordance with the details shown on the Drawings,

(ii) Rigidly fastened together, and

(iii) Lowered into the bore intact before concrete is placed.

(b) Spacers shall be utilized to properly locate the reinforcing steel cage in the bore.

E19.3.7 Placing Anchor Bolts

(a) The anchor bolts shall be aligned with a steel template supplied by the Contract Administrator matching the bolt holes in the sign structure base plate. Extreme care shall be used in this operation to ensure bolts are aligned properly. Placement of anchor bolts without the steel template will not be permitted.

(b) The threaded portion of the anchor bolts projecting above the top surface of foundation shall be coated with oil, before the concrete is poured, to minimize the fouling of threads splattered by concrete residue.

E19.3.8 Placing Metal Bases

(a) Contractor to install metal bases as supplied by the Contract Administrator following curing of concrete foundations.

(b) Metal bases are to be installed plumb, level, and flush to the concrete foundation. Contractor to use stainless steel washers to level bases as required.

E19.3.9 Forms

(a) Forms for exposed surfaces that require an “ordinary surface finish” shall be made of good quality plywood, or an approved equivalent, or uniform thickness, with or without a form liner.

(b) Architectural concrete form liner shall be as specified on the Plans or equivalent as approved by the Engineer.

(c) Permeable formwork liner shall be Drainoform, Zemdrail II, or equivalent as approved by the Engineer.

(d) Formwork materials shall conform to CSA Standard CAN/CSA-A23.1, and American Concrete Publication SP:4, “Formwork for Concrete”.

(e) No “stay-in-place” formwork or falsework is permitted.

(f) Form sheeting plywood to be covered with form liner or to be directly in contact with soil shall be exterior Douglas Fir, concrete form grade, conforming to CSA Standard O121-M1978, a minimum of 20 mm thick.\

(g) Where form liner is not being used, form sheeting shall be Douglas Fir, overlay form liner type conforming to CSA Standard O121-M1978. Approved manufacturers are “Evans” and “C-Z”.

(h) Boards used for formwork shall be fully seasoned and free from defects such as knots, warps, cracks, etc., which may mark the concrete surface.

(i) No formwork accessories will be allowed to be left in place within 50 mm of the surface following form removal. Items to be left in place, must be made from a nonrusting material or galvanized steel; and they shall not stain, blemish, or spall the concrete surface for the life of the concrete.

(j) Forms for exposed concrete surfaces that do not require a form liner may be either new plywood or steel as authorized by the Contract Administrator.

(k) Studding shall be spruce or pine and shall have such dimensions and spacing that they shall withstand distortion from all the forces to which the forms will be subjected. Minimum dimensions shall be 50 mm x 150 mm.

(l) Walers shall be spruce or pine, with minimum dimensions of 100 mm x 150 mm.

(m) All forms are incidental to these Works and must be removed by the Contractor once adequate strength and curing of the concrete has been achieved.

(n) 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.

E19.3.10 Placing Concrete

(a) 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.

(b) 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 foundation.

(c) Concrete shall be placed to the elevations as shown on the Drawings. The top surface of the foundation shall be finished smooth and even with a hand float.

(d) 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.

E19.3.11 Protection of Newly Placed Concrete

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

E19.3.12 Construction Joints

(a) Construction joints shall be located only where shown on the Drawings or as otherwise approved in writing by the Contract Administrator. Construction joints shall be at right angles to the direction of the main reinforcing steel. All reinforcing steel shall be continuous across the joints. Bevelled shear keys, as shown on the Drawings or approved by the Contract Administrator, shall be provided at all joints.

(b) In lieu of shear keys, the Contractor may roughen the surface as follows. The surface shall be rough, with a minimum amplitude of 6 mm. Acceptable procedures to obtain this rough surface are as follows:

(i) By removing the mortar from between the larger aggregate particles with a water jet and soft brush when the concrete is in a semi-hardened state (greencut).

(ii) By first applying a chemical retarder to the surface and then removing the mortar from the larger aggregate particles with a water jet and brush.

(c) The face of joints shall be cleaned of all laitance and dirt, after which the cementitious grout or an approved bonding agent shall be applied. Forms shall be retightened, and all reinforcing steel shall be thoroughly cleaned at the joint prior to concreting.

E19.3.13 Curing Concrete

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

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

(c) 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.

(d) Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3º in one hour or 20º in twenty-four hours.

E19.3.14 Form Removal

(a) 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.

(b) The minimum strength of concrete in place for safe removal of forms shall be 20 MPa.

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

E19.3.15 Patching of Formed Surfaces

(a) Immediately after forms around top of foundation 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.

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

(c) Minor surface defects caused by honeycomb, air pockets greater than 5 mm in diameter, and voids left by strutting, and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the area to be patched and then applying patching mortar. A slurry grout consisting of water and cement shall be 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.

E19.3.16 Cold Weather Concreting

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

E19.3.17 E13.3.17 Anti-Graffiti Coating

(a) Anti-graffiti coating shall be applied to all planter walls shown on the drawings or identified by the Contract Administrator.

(b) The anti-graffiti coating shall be applied according to manufactures specifications.

(c) Maintain anti-graffiti coating on all vertical concrete surfaces for a period of two (2) years.

E19.3.18 Waterproofing

(a) Waterproofing membrane shall be applied to all new concrete planter interior walls and existing concrete columns within the planters which will come into contact with planting soil, as identified on the drawings or by the Contract Administrator. The waterproofing membrane shall be roller applied according to manufactures specifications.

E19.3.19 Quality Control

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

(b) The Contractor shall be responsible for making a thorough inspection of materials to be supplied under this Contract. All material shall be free of surface imperfections and other defects.

E19.4 Measurement and Payment

E19.4.1 Construction of Cast-in-Place Concrete Foundations

(a) Construction of cast-in-place concrete foundations will be measured on a unit basis and will be paid for at the Contract Unit Price per foundation for the “Items of Work” listed here below for concrete foundations constructed in accordance with this Specification and accepted by the Contract Administrator.

(i) Items of Work:

- Cast-in-Place Concrete Foundations
- (a) Bus Stop Flag Foundation
- (b) Information Kiosk Foundation
- (c) Concrete Pile and Cap for Illuminated Signage Structure
- (d) Overhead Sign Structure Base

E20. SUPPLY AND INSTALLATION OF INLAID LONGITUDINAL LANE LINE MARKING TAPE

DESCRIPTION

E20.1 This specification covers the supply and installation of inlaid longitudinal lane line marking tape in asphaltic concrete overlay for Pembina Highway from Arbuthnot Street to Osborne Street.

GENERAL

E20.2 Drawing and Manuals

(a) Drawing 5516006-C-19 – Inlaid Longitudinal Lane Line Markings

(b) Attached Manual; 3M Stamark™ Tapes Pavement Surface Preparation and Application Techniques, included in **Appendix B**.

(c) Attached Manual; 3M Stamark™ Pavement Marking Tape – Application Guidelines for Pavement Markings in Grooved Pavement Surfaces, included in **Appendix B**.

MATERIAL

E20.3 PB 380I ES - 3M™ Stamark™ High Performance Tape Series 380I ES (white)

E20.4 Surface Preparation Adhesive P-50 for 3M™ Stamark™ Pavement Marking Tape

E20.5 Source

E20.5.1 3M Canada Company

Available from:

Guardian Traffic Services
982 Powell Avenue
Winnipeg, Manitoba, R3H 0H6
Ph: 204-233-1600

CONTRUCTION METHODS

E20.6 Prepare the asphaltic concrete overlay surface in accordance with Manufacturer's pavement surface preparation and application techniques manual (attached).

E20.7 Groove asphaltic concrete overlay and install pavement marking tape in accordance with Manufacturer's installation manual (attached).

MEASUREMENT AND PAYMENT

E20.8 Supply and installation of inlaid longitudinal lane line marking tape will be measured on a length basis and paid for at the Contract Unit Price per metre for "Supply and Installation of Inlaid Longitudinal Lane Line Marking Tape". The length to be paid for will be the total number of metres of inlaid longitudinal lane line marking tape supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E20.9 Preparation and grooving of existing asphaltic concrete overlay for inlaid longitudinal lane line marking tape shall be included in the cost of "Supply and Installation of Inlaid Longitudinal Lane Line Marking Tape" and no separate measurement and payment will be made.

E21. SOFT EXCAVATION TO EXPOSE UNDERGROUND UTILITIES

DESCRIPTION

E21.1 This Specification covers the soft excavation to expose underground utilities to determine the depth of the underground utility and whether it will interfere with the excavation, pavement widening and sewer Works on Pembina Highway.

E21.2 At various locations on Pembina Highway, a 200mm diameter high pressure gas pipeline runs along the length of the median boulevard of Pembina Highway from Arbuthnot Street to Osborne Street.

CONSTRUCTION METHODS

E21.3 Prior to commencement of excavation, pavement widening and sewer Works in median boulevard of Pembina Highway, the Contractor shall use soft digging or hand excavation to expose the 200mm diameter high pressure gas pipeline along the median.

E21.4 Locations of soft digging to expose the underground utilities will be every 25 meters and as required between median openings.

E21.5 The Contractor shall follow all procedures for working around the high pressure gas pipelines as required by Manitoba Hydro.

MEASUREMENT AND PAYMENT

E21.6 Soft digging of earthen material to expose underground utilities will be measured on an hourly basis and paid for at the Contract Unit Price per hour for "Soft Excavation to Expose Underground Utilities". The hours to be paid for will be the total number of hours of soft digging in accordance with this Specification, accepted and measured by the Contract Administrator.

E22. LANDSCAPING CURB

DESCRIPTION

E22.1 Further to CW 3240, this Specification covers the installation of landscaping curb for raising the back of sidewalk grades along properties.

MATERIAL

E22.2 Concrete

(a) Supply concrete material in accordance with CW 3310.

E22.3 Reinforcing Steel

(a) Supply curb reinforcing steel in accordance with CW 3310.

CONSTRUCTION METHODS

E22.4 Install landscaping curbs at locations as shown on the Drawings or as directed by the Contract Administrator.

E22.5 Excavate only material immediately behind curbs that is required for installation to a maximum distance of 150mm.

E22.6 Install new reinforcing steel and tie-bars as shown on the Standard Details. Provide a minimum of 40 millimetres cover between reinforcing steel and the finished concrete surface.

E22.7 Clean concrete pavement surfaces immediately prior to the curb installation to the satisfaction of the Contract Administrator.

E22.8 Apply bonding grout in accordance with CW 3310 as required.

E22.9 Install landscaping curb in accordance with SD-203A, SD-203B, SD-204, SD-205 and SD-206A.

E22.10 Place concrete in accordance with CW 3310.

E22.11 Place and compact suitable backfill material behind the curbs to the satisfaction of the Contract Administrator.

MEASUREMENT AND PAYMENT

E22.12 Landscaping curb installation will be measured on a length basis and paid for at the Contract Unit Price for "Construction of Landscaping Curb". The length to be paid for will be the total

number of metres of concrete curb installed in accordance with this specification, accepted and measured by the Contract Administrator.

E22.13 No additional payment will be made for levelling course.

E22.14 Base course will be paid in accordance with CW 3110.

E22.15 Supply and placement of bonding ground for concrete curbs will not be measured for payment.

E23. WOODEN POSTS AND FENCING REMOVAL

DESCRIPTION

E23.1 This Specification covers the removal of existing wooden posts and fencing.

CONSTRUCTION METHODS

E23.2 Salvage all existing material as practical for future reinstallation

E23.3 Haul away all unsalvageable materials.

MEASUREMENT AND PAYMENT

E23.4 Wooden Posts and Fencing Removal will be measured on a length basis and paid for at the Contract Unit Price per metre for “Removal of Wooden Posts and Fencing”. The length to be paid for will be the total number of metres of Wooden Fencing removed in accordance with this Specification, accepted and measured by the Contract Administrator. The price shall include all costs for the removal of all posts, fencing, miscellaneous fastening devices and all other work related to the removal of the fence.

E24. WOODEN POSTS AND FENCING INSTALLATION

DESCRIPTION

E24.1 This Specification covers the installation of wooden posts and fencing. The Contractor is to provide all labour, materials, methods, equipment and accessories for the fabrication and installation of the wood fence.

REFERENCES

E24.2 American Wood-Preservers’ Association (AWPA)

(a) AWPA M2, Standard for Inspection of Treated Wood Products,

(b) APWA M4, Standard for the Care of Preservative-Treated Wood Products.

E24.3 Canadian Standards Association (CSA International)

(a) CSA B111, Wire Nails, Spikes and Staples,

(b) CSA O141 Softwood Lumber,

(c) CSA 080, Wood Preservation,

(d) CSA 080.20, fire-retardant treatment of lumber by pressure processes,

MATERIALS

E24.4 Pressure Treated Wood

(a) Material: to be pressure treated wood, no. 1 grade, colour: match existing fence, moisture content: 19% or less in accordance with the following standards;

(i) CAN/CSA-O141,

(ii) NLGA Standard Grading Rules for Canadian Lumber, and

(iii) Forest Stewardship Council (FSC) certified.

(b) Preservative for above ground use: to CSA-O80 Series, ACQ-C treatment, clear finish. Minimum retention: 4.0 kg/m^3.

(c) Preservative for ground contact: to CSA-O80 Series, ACQ-C treatment, clear finish. Minimum net retention: 6.4 kg/m^3.

E24.5 Hardware

(a) Nails and spikes: to CAS B111, galvanized, for exterior works and for treated lumber. Use spiral thread nails.

(b) Bolts, nuts, washers and lag screws are to be hot dipped galvanized, sizes to suit application.

SUBMITTALS

E24.6 Submit product data and samples of the following to the Contract Administrator;

(a) Pressure Treated Wood.

E24.7 Shop Drawings

(a) Submit shop drawings of the wood fence.

(b) Indicate dimensions, sizes, assembly, anchorage and installation detail. Use construction drawings as reference. Confirm existing conditions on site by taking as-built field measurements to prepare shop drawings.

(c) Clearly indicate materials, core thickness, finishes, connections, joints, methods of anchorage, number and size of anchors, supports, reinforcement details and accessories.

E24.8 Quality Assurance

E24.8.1 Carpentry shall be performed by trained and qualified craftspeople with demonstrable experience sourcing and work.

E24.8.2 Conduct a pre-installation meeting with the Contract Administrator to verify requirements.

E24.8.3 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

E24.8.4 For products treated with preservative by pressure impregnation, submit the following information certified by authorized signing officer of treatment plant;

(a) Information listed in AWPA.M2 and revisions specified in CAN/CSA-O80 Series, Supplementary Requirement to AWPA Standard M2 applicable to specified treatment.

(b) Moisture content after drying following treatment with water-borne preservative.

E24.8.5 All wood is to be free of defects. Any warped, checked or bent materials will be rejected.

E24.8.6 If Contractor cannot match new wood fence dimensions and colour to existing wood fence dimensions and colour, the Contract Administrator may consider that all proposed fence be replaced with new.

CONSTRUCTION METHODS

E24.8.7 Handle and use treated and non-treated wood in a manner which will avoid damage or field fabrication causing alteration in original treatment.

E24.8.8 Re-treat pressure treated wood surfaces exposed by cutting, trimming or boring with liberal brush application of clear preservative and fire retardant before installation. Ensure that damaged areas such as abrasions, nail and spike holes areas are thoroughly saturated with field treatment solutions as per CSA-O80 and CSA-O80.20.

E24.8.9 Construct all work as indicated on the drawings using adequate fastening methods to ensure solid durable finished work suitable for the purpose intended.

E24.8.10 Do all nailing and fastening neatly, evenly and thoroughly.

E24.8.11 Frame anchor, fasten, tie and brace members to provide necessary strength and rigidity. Install all members true to line, levels and elevations.

E24.8.12 Set plumb and space uniformly. Countersink bolts where necessary to provide clearance for other work.

MEASUREMENT AND PAYMENT

E24.9 Supply and Installation of wood fencing will be measured on a linear metre basis and paid for at the Contract Unit Price for "Supply and Installation of Wooden Posts and Fencing". The length to be paid for shall be the total number of metres supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator. If the Contractor cannot match new wood fence dimensions and colour to existing wood fence dimensions and colour, the Contract Administrator may consider that all proposed fence be replaced with new, and be paid for at the Contract Unit Price for "Supply and Installation of Wooden Posts and Fencing".

E25. CONCRETE F-TYPE TRAFFIC BARRIER REMOVAL

DESCRIPTION

E25.1 This Specification covers the removal of the concrete f-type traffic barrier located near the Pembina Highway and Osborne Street Intersection.

MEASUREMENT AND PAYMENT

E25.2 Concrete F-Type Traffic Barrier Removal will be measured on a linear metre basis and paid for at the Contract Unit Price per metre for "Removal of Existing Concrete F-Type Traffic Barrier". The length to be paid for will be the total number of metres of Concrete F-Type Traffic Barrier removed in accordance with this Specification, accepted and measured by the Contract Administrator. The price shall include all costs for the removal of all pavement, concrete, reinforcement, miscellaneous fastening devices and all other work related to the removal of the traffic barrier.

E26. W-BEAM GUARDRAIL INSTALLATION

GENERAL

E26.1 This specification is for the supply and installation of a Strong-Post W-Beam Guardrail with steel posts.

E26.2 Installation shall be completed according to the manufacturer's recommendations and instructions.

E26.3 Work shall include supply of all materials, and furnishings of all superintendence, overhead, labour, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all work as hereinafter specified.

MATERIALS

E26.4 General

E26.4.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials set forth in this Specification.

E26.5 Storage and Handling

E26.5.1 Barrier rail and posts shall be stored in neat regular piles, on blocks or built up platforms, in order to avoid damage or contamination, and for ease of checking, handling and inspection.

E26.5.2 All other barrier components shall be stored in such a manner as to avoid damage, contamination or deterioration.

E26.5.3 All materials shall be handled carefully and transported in such a manner so as to ensure that the material is not damaged.

E26.6 Rails and Terminal Elements

E26.6.1 All rail sections and other components shall match the design profiles and dimensions of the AASHTO/ARTBA hardware requirements.

E26.6.2 The rails and terminal elements shall be manufactured from open hearth, electric furnace or basic oxygen semi-spring steel sheet, all in general accordance with the AASHTO Standard Designation M180 and shall conform to the drawings provided in the contract and in the AASHTO-AGC-ARTBA publication “A Guide to Standardized Highway Barrier Hardware”.

E26.6.3 Rails shall be punched for splice and post bolts in conformity with the AASHTO Standard to the designated number of and centre to centre spacing of posts. If holes are punched after galvanizing the galvanizing around the hole shall be repaired in accordance with the latest edition of CSA Standard G164.

E26.6.4 Material Properties

(a) Properties of the base metal for the rails shall conform to the following requirements:

(i) Minimum Yield Point: 345 MPa;

(ii) Minimum Tensile Strength: 483 MPa; and

(iii) Minimum Elongation: Minimum 12% in 50mm length.

E26.6.5 Sheet Thickness

(a) The rails and terminal elements thickness shall be manufactured according to Table 2 (Class A Type II) of AASHTO Standard M180 with nominal base metal thickness of 2.67 mm, galvanized finished thickness of 2.82mm, with a tolerance of 0.23mm.

E26.6.6 Sheet Width

(a) Sheet width for the W-beam rail shall be 483 mm with a permissible tolerance of minus 3 mm

(b) All welding for the fabrication of terminal elements shall conform to the requirements of CSA W59M. All welders, welding operators and tackers shall be approved by the Canadian Welding Bureau in their particular category.

(c) All rails and terminal elements shall be hot dip galvanized after fabrication, conforming to the current edition of ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

(d) A copy of the producer’s certificate, conforming to Section 16 of CSA G40.20M, for each of the mechanical and chemical tests, including impact tests, shall be provided to the Contract Administrator upon request

E26.7 Bolts, Nuts and Washers

E26.7.1 All bolts, nuts and washers shall conform to ASTM A307, unless noted otherwise on the drawings, and shall be hot dip galvanized conforming to the current edition of ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

E26.8 Steel Posts

E26.8.1 Steel posts will be used for the entire length of the guardrails.

E26.8.2 Steel for posts, spacers and hardware shall conform to CSA Standard G40.21 Grade 350W or ASTM Standard A36 and shall be hot dip galvanized after fabrication conforming

to ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

E26.9 Inspection of Materials

E26.9.1 All guardrail materials are subject to inspection and materials which fail to meet these specifications will be rejected, and shall be replaced or repaired at no cost to the the City.

CONSTRUCTION METHODS

E26.10 Site Inspection

E26.10.1 Prior to commencing installation of the barrier at a location, the contractor shall verify that the barrier can be installed in strict accordance with the Drawings.

E26.10.2 This shall include contacting all Utilities and other owners of underground facilities in order to ensure that the proposed location of the posts is not in conflict with existing or proposed utilities and installations.

E26.10.3 Should there be a conflict between a proposed location and any facility, the Contract Administrator must be notified immediately.

E26.11 Rail and Post Installation

E26.11.1 Guardrail shall be accurately set to the required depth and alignment, in a manner resulting in a smooth continuous installation, as shown on the drawings or as directed by the Contract Administrator. Permissible tolerance for plumb and grade of posts shall be 6mm.

E26.11.2 Any guardrail material requiring field modification to fit shall be reported to the Contract Administrator for its acceptance of the modification before work is carried out. Modification by flame cutting method is prohibited. Modification by cold cutting method with a suitable drill press is allowed. Field guardrail modification is considered incidental to the work. Adequate edge distances of guardrail material shall be maintained during the modification process. All exposed steel areas shall be patched with two coats of zinc-rich paint.

E26.11.3 Bolts shall be tightened to a torque of 100Nm.

E26.11.4 The Contractor shall take all necessary precautions to eliminate damage to galvanizing. Minor abrasions shall be repaired by painting with two coats of zinc-rich paint. Major abrasions shall be repaired by regalvanizing. The method to be used for repair of any damage shall be accepted by the Contract Administrator before such work is commenced. The Contractor shall repair or replace components to the satisfaction of the Contract Administrator.

E26.11.5 Surplus excavated material and debris shall be removed from the site.

E26.11.6 Holes for the guardrail posts shall be 300 mm in diameter and be excavated by auger. Excavated material which is unsuitable for use as a backfill shall be replaced with granular material meeting the requirements of Section 2.2 of Specification CW 3110 for Base Course Material. Crushed limestone base course is not allowed for use. The guardrail posts shall rest directly and solidly on the bottom of the hole. After the post is installed, it shall be backfilled. Backfill shall be thoroughly compacted, using pneumatic tampers, in layers not exceeding 150mm.

E26.11.7 Unsuitable material at the bottom of the holes excavated shall be replaced with granular material at the Contractor's expense, as directed by the Contract Administrator. The Contractor shall thoroughly compact the bottom of the holes.

E26.12 Acceptance of Barrier

E26.12.1 A barrier with inaccurate alignment and/or poor grade or curvature shall be corrected by the Contractor at their own expense to the satisfaction of the Contract Administrator.

E26.13 Cleaning

E26.13.1 After the installation of the barrier rail has been completed, the entire barrier shall be thoroughly cleaned by the Contractor to the satisfaction of the Contract Administrator.

MEASUREMENT AND PAYMENT

E26.14 W-Beam Guardrail Installation will be measured on a linear metre basis and paid for at the Contract Unit Price per metre for "Supply and Installation of W-Beam Guardrail". The length to be paid for will be the total number of metres of W-Beam Guardrail supplied and installed in accordance with this Specification, accepted and measured by the Contract Administrator. The price shall include all costs for the supply and installation of the guardrail including all labour, materials, equipment, tools, miscellaneous fastening devices and all other work related to the supply and installation of the W-Beam Guardrail.

E27. CRASH CUSHION ATTENUATOR REMOVAL

DESCRIPTION

E27.1 This Specification covers the removal of the existing crash cushion attenuators located near the Pembina Highway and Osborne Street Intersection.

MEASUREMENT AND PAYMENT

E27.2 Crash Cushion Attenuator Removal will be measured on a unit basis and paid for at the Contract Unit Price for "Removal of Existing Crash Cushion Attenuators". The number of units to be paid for shall be the total number of Crash Cushion Attenuators removed in accordance with this Specification, accepted and measured by the Contract Administrator. The price shall include all costs for the removal of all crash attenuators, posts, fastening devices, foundations and all other materials and work related to the removal of the crash attenuators.

E28. REMOVAL OF EXISTING OVERHEAD SIGN STRUCTURE

DESCRIPTION

E28.1 This Specification covers the removal of the existing overhead Sign Structure at the Pembina Highway and Jessie Avenue intersection.

CONSTRUCTION METHODS

E28.2 Haul away all material associated with the Existing Overhead Sign Structure.

E28.3 The existing signs mounted on the Existing Overhead Sign Structure are to be salvaged and shall be delivered to City of Winnipeg, Traffic Services Branch at 421 Osborne Street, Attention: Mr. Jim Donaldson, Phone 204-232-0301.

SUBMITTALS

E28.4 Prior to Removal of Existing Overhead Sign Structure, the Contractor Shall Submit a Dismantle Plan to the Contract Administrator for approval. Which shall Include:

a) Traffic Accommodation Plan.

b) Procedure of Removing the Existing Overhead Sign Structure.

MEASUREMENT AND PAYMENT

E28.5 Removal of Existing Overhead Sign Structure will be measured on a unit basis and paid for at the Contract Unit Price for "Removal of Existing Overhead Sign Structure". The number of units to be paid for shall be the total number of Removal of Existing Overhead Sign Structure accordance with this Specification, accepted and measured by the Contract Administrator. The price shall include all costs for the removal of all beams and columns, fastening devices, foundations and all other materials and work related to the removal of the overhead structure.

E29. SUPPLY AND INSTALLATION OF OVERHEAD SIGN STRUCTURES

DESCRIPTION

E29.1 The Work covered under this item shall include all operations related to the supply, fabrication, delivery, and erection of new steel overhead sign support structures.

E29.2 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

E29.3 General

E29.3.1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.

E29.3.2 All materials used for fabrication of overhead sign support structures shall be new, previously unused material.

E29.4 Handling and Storage of Materials

E29.4.1 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.

E29.5 Structural Steel

E29.5.1 Structural steel for vertical shafts and horizontal members 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%. All other structural steel for flanges and base plates shall be CSA Standard G40.21 M, Grade 300 W.

E29.5.2 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.

E29.5.3 Steel shall not be acceptable unless the mill test certificate states the grade to be 350 MPa (50 ksi) or 300 MPa (44 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.

E29.6 Flange Bolts, Nuts and Washers

E29.6.1 Flange bolts, nuts, and washers shall be in accordance with ASTM A153 hot-dip galvanized.

E29.7 Fasteners for Handhole Covers and Sign Mounting Brackets

E29.7.1 Fasteners for handhole covers and sign mounting brackets shall be in accordance with ASTM A276 Type 316 stainless steel.

E29.8 Hot-Dip galvanizing

E29.8.1 All hot-dip galvanizing shall be in accordance with ASTM A123 for a minimum net retention of 600 g/m^2.

E29.9 Galvanizing Touch-up and Field-Applied Galvanizing

E29.9.1 Only approved products listed below shall be used for field-applies galvanizing, to touch-up damaged hot-dip galvanizing on-site and to galvanize field welds.

E29.9.2 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, 25 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, 25 McPhillips Street, Winnipeg.

E29.9.3 Approved cold-applied galvanic anti-corrosion system is as follows:

(a) 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

E29.10 Anchor Bolts and Setting Template

E29.10.1 Anchor bolts including nuts and washers, and setting template shall be in accordance with CSA G40.21 Grade 300W, 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 before.

E29.11 Non-shrink Grout

E29.11.1 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, nonmetallic 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

(d) Caprock VLT mortar by Cappar Ltd. For cold weather construction (0 C to -20 C)

E29.11.2 The grout shall be of a consistency suitable for the application intended, as approved by the contract administrator.

E29.12 Sign Panels/Boxes/Plates

E29.12.1 Sign panels/boxes/plates will be supplied by the City of Winnipeg Traffic Signals Branch.

E29.13 Welding Consumables

E29.13.1 Welding consumables for all processes shall be certified by the manufacturer to be complying with the requirements of CSA Standard W59-M1984 and the following Specifications:

(a) Manual shielded metal arc welding (SMAW):
All electrodes shall be basic-type electrodes conforming to CSA W48.1-M1991 or W48.3-M1982, classification E480XX, or imperial equivalent.

(b) Gas metal arc welding (GMAW)
All electrodes shall conform to CSA W48.4-M1980, classification ER480S-X, or imperial equivalent.

(c) Flux cored arc welding (FCAW)
All electrodes shall conform to CSA W48.5-M1982, classification E480XT-X or imperial equivalent. Electrodes shall be controlled by hydrogen (CH) designation.

(d) Submerged arc welding (SAW)
All electrodes shall conform to CSA W48.6-M1980, classification F480X-EXXX or imperial equivalent

(e) Shielding gas shall be welding grade carbon-dioxide with a guaranteed dew point of -46ºC.

(f) All electrodes, wires, and fluxes used shall be of a classification requiring a minimum impact of 27 joules at -18ºC.

E29.13.2 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.

E29.14 Miscellaneous Materials

E29.14.1 Miscellaneous material incidental to this Work shall be as approved by the Contract Administrator.

E29.15 Equipment

E29.15.1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order.

CONSTRUCTION METHODS

E29.16 General Requirements

E29.16.1 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.

E29.16.2 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.

E29.16.3 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.

E29.16.4 The sign support structure shall be so fabricated that erection can be achieved by means of bolted connections. 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 on each shaft, arm, and crossbeam etc. of the structure before hot-dip galvanizing.

E29.16.5 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.

E29.16.6 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.

E29.16.7 Cast-in-Place Concrete Piles shall achieve 100% of their required strength prior to erection of the Overhead Sign Structures.

E29.17 Fabrication

E29.17.1 Prior to fabricating the horizontal members for the structures, the Contractor shall be responsible for verifying the distance between the pile foundations for the full span structures.

E29.17.2 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, Luminaries, and Traffic Signals - 2009- 5th Edition, plus all subsequent revisions.

E29.17.3 The punching of identification marks on the members will not be allowed, except for the structure identification number.

E29.17.4 Any damage to members during fabrication shall be drawn to the attention of the Contract Administrator in order that the Contract Administrator may approve remedial measures.

E29.17.5 Dimensions and fabrication details that control the field matching of parts shall receive very careful attention in order to avoid field adjustment.

E29.17.6 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.

E29.17.7 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.

E29.17.8 All holes shall be provided by drilling not burning. All holes shall be free of burrs and rough edges.

E29.18 Welding

E29.18.1 Welding of steel structures shall be in accordance with CSA W59, "Welded Steel Construction."

E29.18.2 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.

E29.18.3 Longitudinal seam welds in horizontal supports shall be located at the top of the horizontal members.

E29.18.4 All welds shall be ground smooth and flush with the adjacent surface prior to hot-dip galvanizing.

E29.19 Surface Preparation and Cleaning

E29.19.1 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/m_2. All welding and provision of holes is to be completed prior to surface preparation and cleaning, except where shown on the Drawings.

E29.19.2 The sandblasting and cleaning of sign structures shall be done in the shop.

E29.19.3 After the fabricated sign structures have been sandblasted and cleaned, a certified testing agency, hired and paid for by the Contractor, shall carry out a visual inspection of the structures in the shop before they are shipped to the galvanizing plant, as directed by the Contract Administrator.

E29.20 Hot-Dip Galvanizing

E29.20.1 The hot-dip galvanizing plant shall be a Regular Member of the American Galvanizers Association, Inc. and certified to ASTMA123.

E29.20.2 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.

E29.20.3 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.

E29.20.4 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.

E29.20.5 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 luster. 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.

E29.20.6 Minor defects in the galvanizing coating shall be repaired in accordance with Section 3.1.4.19 of this Specification. 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.

E29.20.7 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.

E29.20.8 The Contractor shall verify the thickness of galvanized coatings as directed by the Contract Administrator.

E29.20.9 All threaded couplings shall be rethreaded after the sign structures have been hot-dip galvanized.

E29.20.10 The sign structures shall be stored on timber blocking after hot-dip galvanizing.

E29.20.11 The Contractor shall provide rest results confirming hot galvanizing compliance (Plant Certification)

E29.21 Delivery and Erection

E29.21.1 The Contractor shall notify the Contract Administrator at least (2) Working Days in advance of the anticipated delivery to the Site and erection of the overhead sign support structures.

E29.21.2 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 surfaces will not be permitted. The structure components (shaft, arm, cross beam etc.) shall be placed on timber blocking and secured with nylon ropes during their transportation to the Site.

E29.21.3 Each anchor bolt shall be provided with two galvanized nuts--one nut below the base plate for leveling 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 75 mm thick grout pad under the base plate.

E29.21.4 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.

E29.21.5 The signs to be installed will be supplied by City of Winnipeg, Traffic Services Branch at 421 Osborne Street, Contact: Mr. Jim Donaldson, Phone 204-232-0301.

E29.22 Installation of Sign Panels/Boxes/Plates

E29.22.1 The Contractor will be responsible for installation of sign panels/boxes/plates complete with sign mounting brackets.

E29.23 Grout Pads

E29.23.1 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.

E29.24 Field-Applied Touch-up Galvanizing

E29.24.1 Any areas of damaged galvanizing on the sign structures shall receive field-applied touch-up galvanizing.

E29.24.2 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.

E29.24.3 For self-fluxing, low temperature, zinc based alloy rods, preheat the surface to 315ºC 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 400ºC and to not apply direct flame to the alloy rods.

E29.24.4 For pure zinc paint 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

E29.25 General

E29.25.1 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.

E29.25.2 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.

E29.26 Welding Qualifications

E29.26.1 The Contractor shall provide 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.

E29.26.2 Approved welding procedures shall be submitted to the Contract Administrator prior to fabrication of any street items.

E29.27 Testing

E29.27.1 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.

E29.27.2 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:

(i) Visual inspection of 100 percent of welds.

(ii) Ultrasonic testing of 100 percent of full penetration sections of longitudinal seam welds and circumferential butt welds.

(iii) Magnetic particle testing of a random 10 percent of partial penetration sections of longitudinal seam welds.

(iv) Ultrasonic testing of 25 percent of base plate and flange plate welds.

(v) Inspection of hot-dip galvanizing and coating thickness.

E29.27.3 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.

E29.27.4 No repair shall be made until agreed to by the Contract Administrator.

E29.27.5 Defects in hot-dip galvanizing shall be rectified as directed by the Contract Administrator.

E29.28 Unacceptable Work

E29.28.1 Any Work found to be unacceptable shall be corrected in accordance with CSA W59.

E29.28.2 No repair shall be made until agreed to by the Contract Administrator.

E29.28.3 The Contractor shall be responsible for all costs incurred by the the City/Contract Administrator related to retesting/re-inspections of work found to be unacceptable.

MEASUREMENT AND PAYMENT

E29.29 Supply and Installation of Overhead Sign Support Structures

E29.29.1 Supply and installation of steel overhead sign support structures will be measured on a unit basis and paid for at the Contract Unit Price for “Supply and Installation of 16.92m Full Span Overhead Sign Structure” and “Supply and Installation of 11.60m Cantilever Sign Structure” per Site for the “Items of “Work” listed on the Schedule of Unit Prices. The number of units to be paid for will be the total number of overhead sign support structures, either cantilever or full span, supplied and installed in accordance with this Specification and accepted by the Contract Administrator.

E29.29.2 Items of Work:

Supply and Installation of Steel Overhead Sign Support Structures

(a) Structure No. S778 Pembina Highway, at the intersection of Pembina Highway and Jessie Avenue – Type 2.1 Bridge Structure.

(b) Structure No. S779 Corydon Avenue, west of the intersection of Corydon Avenue and Osbourne Avenue – Type 1.1 Cantilever Structure.

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