



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 27-2017

**2017 NORTHEAST EXCHANGE DISTRICT STREET RENEWAL, PACIFIC AVENUE
AND 1919 GENERAL STRIKE MONUMENT**

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 2017 Northeast Exchange District Street Renewal, Pacific Avenue and 1919 General Strike Monument

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, February 28, 2017.

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

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

B3. SITE INVESTIGATION

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

B4. ENQUIRIES

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

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

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

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

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

B5. CONFIDENTIALITY

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

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

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

B6. ADDENDA

- B6.1 The Contract Administrator may, at any time prior to the Submission deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.
- B6.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B6.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B6.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B6.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B7. SUBSTITUTES

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

- B7.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B7.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B7.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B17.
- B7.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B8. BID COMPONENTS

- B8.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
 - (b) Form B: Prices, hard copy;
 - (c) Bid Security
 - (i) Form G1: Bid Bond and Agreement to Bond, or
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
a certified cheque or draft;
- B8.2 Further to B8.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B7.
- B8.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B8.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B8.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.
- B8.4.2 A hard copy of Form B: Prices must be submitted with the Bid. If there is any discrepancy between the Adobe PDF version of Form B: Prices and the Microsoft Excel version of Form B: Prices, the PDF version shall take precedence.
- B8.5 Bidders are advised not to include any information/literature except as requested in accordance with B8.1.
- B8.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B17.1(a).
- Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B8.7 Bids shall be submitted to:
The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1

B9. BID

B9.1 The Bidder shall complete Form A: Bid, making all required entries.

B9.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
- (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
- (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
- (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B9.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B9.2.

B9.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B9.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
- (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, shall be affixed;
- (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B9.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B9.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B10. PRICES

B10.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B10.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.

B10.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B10.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B11. DISCLOSURE

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

B11.2 The Persons are:

- (a) N/A

B12. QUALIFICATION

B12.1 The Bidder shall:

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

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

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

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

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

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

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

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

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

B13. BID SECURITY

B13.1 The Bidder shall provide bid security in the form of:

- (a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or
- (b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or
- (c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.

B13.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.

B13.1.2 All signatures on bid securities shall be original.

B13.1.3 The Bidder shall sign the Bid Bond.

B13.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

B13.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.

B13.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B13.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B13.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B13.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

B14. OPENING OF BIDS AND RELEASE OF INFORMATION

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

B14.1.1 Bidders or their representatives may attend.

B14.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B13 will not be read out.

- B14.2 Following the submission deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B14.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B14.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B15. IRREVOCABLE BID

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

B16. WITHDRAWAL OF BIDS

- B16.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B16.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.
- B16.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B16.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:
- (a) retain the Bid until after the Submission Deadline has elapsed;
 - (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
 - (c) if the notice has been given by any one of the persons specified in B16.1.3(b), declare the Bid withdrawn.
- B16.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B15.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law, including the right to retain the Bidder's bid security.

B17. EVALUATION OF BIDS

- B17.1 Award of the Contract shall be based on the following bid evaluation criteria:
- (a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation therefrom (pass/fail);

- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B12 (pass/fail);
- (c) Total Bid Price;

B17.2 Further to B17.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B17.3 Further to B17.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.

B17.4 Further to B17.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B17.4.1 Further to B17.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B17.4.2 The electronic Form B: Prices and the formulas imbedded in that spreadsheet are only provided for the convenience of Bidders. The City makes no representations or warranties as to the correctness of the imbedded formulas. It is the Bidder's responsibility to ensure the extensions of the unit prices and the sum of Total Bid Price performed as a function of the formulas within the electronic Form B: Prices are correct.

B18. AWARD OF CONTRACT

B18.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B18.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B18.2.1 Without limiting the generality of B18.2, the City will have no obligation to award a Contract where:

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

B18.3 The Work of this Contract is contingent upon Council approval of sufficient funding in the 2017 Capital Budget. If the Capital Budget approved by Council does not include sufficient funding for the Work, the City will have no obligation to award a Contract.

B18.4 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B17.

B18.4.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

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

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of:

- (a) Pavement Rehabilitation and Streetscaping
 - (i) Pacific Avenue from Main Street to Lily Street
- (b) Pedestrian Lighting and Associated Works
 - (i) Pacific Avenue from Main Street to Lily Street
- (c) Construction of Structural Monument
 - (i) East sidewalk on Lily Street between Market Avenue and Elgin Avenue
- (d) Lily/Galt Gate Chamber Upgrades
 - (i) Intersection of Lily Street at Galt Avenue.

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

- (a) Pavement Rehabilitation and Streetscaping
 - (i) Full depth concrete repairs of existing joints and slabs;
 - (ii) Removal of existing curbs;
 - (iii) Removal of existing sidewalk;
 - (iv) Adjustment of catch basins, manholes and appurtenances
 - (v) Installation of catch basins/catch pits and connection pipe;
 - (vi) Sewer repairs (if needed);
 - (vii) Renewal of existing curbs in gutter lane (100mm reveal)
 - (viii) Renewal of existing sidewalk
 - (ix) Construction of barrier curb (100mm reveal)
 - (x) Construction of 100mm Sidewalk with Block-outs for Interlocking Paving Stones
 - (xi) Placement of Type 1A Asphalt Overlay (50-100mm);
 - (xii) Installation of Detectable Warning Surface Tiles at intersecting streets;
 - (xiii) Installation of tree wells and covers; and
 - (xiv) Installation of site furniture;
- (b) Pedestrian Lights and Associated Works
 - (i) Luminaire installation;
 - (ii) Installation of weatherproof panel board; and
 - (iii) Installation of pedestrian and feature lighting;

- (c) Construction of Structural Monument
 - (i) Installation of concrete pile foundation
 - (ii) Installation of steel columns
 - (iii) Installation of concrete floor slabs
 - (iv) Construction of joint keys
 - (v) Installation of steel beams
 - (vi) Installation of concrete grade beam
 - (vii) Installation of roof panels
 - (viii) Installation of steel girts
 - (ix) Installation of monument panels
 - (x) Installation of interpretive text panels
 - (xi) Installation of map panels
 - (xii) Installation of wood bench and stage
 - (xiii) Installation of outlet boxes; and
 - (xiv) Installation of luminaires with dimmer control.
- (d) Lily/Galt Gate Chamber Upgrades
 - (i) Pre-Construction inspection of existing structures and adjacent property.
 - (ii) Demolition of roof and removal of steel ladder on existing gate chamber.
 - (iii) Construction of a new cast-in-place concrete gate chamber roof and manhole riser including installation of new steel ladder with associated hardware, and installation of a new manhole cover and frame.
 - (iv) Excavation and Backfilling as required.
 - (v) Construction of temporary asphalt pavement with granular base course.
 - (vi) Site restoration and clean up.

D3. DEFINITIONS

- D3.1 When used in this Bid Opportunity:
- (a) "**ASTM**" means American Society for Testing and Materials ;
 - (b) "**CSA**" means Canadian Standards Association .

D4. CONTRACT ADMINISTRATOR

- D4.1 The Contract Administrator is MMM Group Limited, a WSP Company , represented by:
Vilko Maroti, C.E.T., P.Eng.
Manager, Highways, Roads, and Urban Centres
Telephone No.: 204 943-3178
Email Address: MarotiV@mmm.ca
- D4.2 At the pre-construction meeting, Vilko Maroti, C.E.T., P.Eng. will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.
- D4.3 Bids Submissions must be submitted to the address in B8.8

D5. CONTRACTOR'S SUPERVISOR

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

D6. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

- D6.1 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.
- D6.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.
- D6.3 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.
- D6.4 A Contractor who violates any provision of D6 may be determined to be in breach of Contract.

D7. NOTICES

- D7.1 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.
- D7.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D7.3 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the facsimile number identified in D4.1.
- D7.3 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following facsimile number:
- The City of Winnipeg
Legal Services Department
Attn: Director of Legal Services
Facsimile No.: 204-947-9155
- D7.4 **Bids Submissions must not be submitted to this facsimile number. Bids must be submitted in accordance with B8.**

D8. FURNISHING OF DOCUMENTS

- D8.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him/her at cost.

SUBMISSIONS

D9. AUTHORITY TO CARRY ON BUSINESS

D9.1 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.

D10. SAFE WORK PLAN

D10.1 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.

D10.2 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>

D11. INSURANCE

D11.1 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.

D11.2 Deductibles shall be borne by the Contractor.

D11.3 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.

D11.4 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.

D12. PERFORMANCE SECURITY

D12.1 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.

D12.1.2 Where the performance security is in the form of a certified cheque or draft, it will be osited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D12.2 If the bid security provided in his/her Bid was not a certified cheque or draft pursuant to B13.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site and in no event later than the date specified in the C4.1 for the return of the executed Contract.

D13. SUBCONTRACTOR LIST

D13.1 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.

D14. DETAILED WORK SCHEDULE

D14.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least o (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.

D14.2 The detailed work schedule shall consist of the following:

- (a) a Gantt chart for the Work based on the C.P.M. schedule.

D14.3 Further to D14.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:

D14.4 Further to D14.2(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

D15. COMMENCEMENT

D15.1 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.

D15.2 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 D9;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the twenty-four (24) hour emergency response phone number specified in D5.2.
 - (iv) the Safe Work Plan specified in D10;

- (v) evidence of the insurance specified in D11;
- (vi) the performance security specified in D12;
- (vii) the subcontractor list specified in D13; and
- (viii) the detailed work schedule specified in D14.

- (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.

D15.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.

D15.4 The City intends to award this Contract by March 17, 2017.

D16. RESTRICTED WORK HOURS

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

D17. WORK BY OTHERS

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

- (a) Manitoba Hydro – Manitoba Hydro will be removing shared hydro poles on Lily Street from Market Avenue to Disraeli Freeway in Spring of 2017;
- (b) Winnipeg Transit – Winnipeg Transit's Bus Platform is located on eastbound Pacific Avenue from Main Street to Martha Street. The Contractor can in no way disrupt Winnipeg Transit service without written approval from Contract Administrator. The Contractor is expected to cooperate with Winnipeg Transit to facilitate construction;
- (c) Sports Manitoba / Bockstael Construction. – Sports Manitoba is currently constructing a new building on Pacific Avenue. The Contractor is expected to cooperate with Sports Manitoba / Bockstael Construction to facilitate construction.
- (d) Centennial Concert Hall / Manitoba Museum. The Contractor is expected to cooperate with both Centennial Concert Hall and Manitoba Museum to accommodate any special events.
- (e) Shaw Cable - Shared hydro poles on Lily Street from Market Avenue to Disraeli Freeway is anticipated to be removed in Spring/Summer of 2017. Shaw Cable will be relocating existing overhead cables on Lily Street and is anticipated to be completed by April, 2017
- (f) Manitoba Telecom Services (MTS) – Shared hydro poles on Lily Street from Market Avenue to Disraeli Freeway is anticipated to be removed in Spring/Summer of 2017. MTS will be relocating existing overhead cables on Lily Street and is anticipated to be completed by April, 2017
- (g) City of Winnipeg / Borland Construction Inc.– Lily Street from Market Avenue to Galt Avenue is currently under construction as part of 2016 Northeast Exchange District Street Renewals (Bid Opportunity No. 345-2016). The Contractor is expected to cooperate with Borland Construction to facilitate construction. All remaining work of Lily Street is anticipated to be completed by June 16, 2017.

D18. SEQUENCE OF WORK

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

D18.1.1 The Work shall be divided into three (3) Phases. Each Phase shall be subdivided into stages. Stages are further subdivided into major items of work.

D18.1.2 **Phase I** – Lily/Galt Gate Chamber Upgrade

- (i) Pre-construction inspection described in D2.2 (d) ;

- (ii) Gate chamber upgrade described in D2.2 (d);,; and
- (iii) Pavement restoration described in D2.2 (d).

D18.1.3 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.

D18.1.4 **Phase II** – Pacific Avenue Rehabilitation from Main Street to Lily Street

(a) **Stage I** – Eastbound Parking Lane and Driving Lane Pavement Rehabilitation

- (i) Pavement Rehabilitation and Streetscaping as described in D2.2 (a) ; and
- (ii) Electrical described in D2.2 (d).

(b) **Stage II** – Westbound Gutter Lane Pavement Rehabilitation

- (i) Pavement Rehabilitation and Streetscaping as described in D2.2 (a) ; and
- (ii) Electrical described in D2.2 (d).

(c) **Stage III** – All Lanes

- (i) Placing bottom and final lift of asphalt on Stage I and Stage II

(d) **Stage IV** – Site Furnishing

- (i) Installation of site furniture (Bike racks, vault cover, tree grates, etc.);
- (ii) Planting of trees; and
- (iii) Installation of pedestrian light standards and associated electrical work.

D18.1.5 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.

D18.1.6 **Phase III** – Construction of 1919 General Strike Monument

(a) **Stage I** – Foundation Work

- (i) Installation of cast-in-place reinforced concrete piles and pile caps; and
- (ii) Installation of concrete anchor bolts ;

(b) **Stage II** – Surface Work

- (i) Construction of concrete sidewalk with concrete blockouts; and
- (ii) Installation of paving stones ;

(c) **Stage III** – Superstructure Work

- (i) Installation of steel columns ;
- (ii) Installation of concrete floor slabs;
- (iii) Construction of joint keys;
- (iv) Installation of steel beams;
- (v) Installation of concrete grade beam;
- (vi) Installation of roof panels;
- (vii) Installation of steel girts;
- (viii) Installation of monument panels, interpretive panels and map panels; and
- (ix) Installation of wood bench and stage;

(d) **Stage IV** – Electrical Work

- (i) Installation of outlet boxes; and
- (ii) Installation of luminaires with dimmer control

D18.1.7 **Construction activity will be strictly prohibited between July 21 and August 13, 2017. Storage/parking of materials, equipment or vehicles on site will not permitted between July 21 and August 13, 2017 to accommodate 2017 Canada Summer Games.**

- D18.1.8 The Contractor shall delay placing the final lift of asphalt on all lanes of the roadway, so that the final lift of all lanes is placed in one operation.
- D18.1.9 Placing the topsoil and finished grading of all boulevard and median areas shall be completed prior to commencing construction of asphaltic concrete overlays, including scratch courses.
- D18.1.10 Immediately following the completion of the asphaltic concrete works, 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.

D19. CRITICAL STAGES

- D19.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:
- (a) Complete **Phase I** by April 27, 2017
 - (b) Complete **Stage I, Stage II and Stage III of Phase II** by July 12, 2017
 - (c) Complete **Stage I and Stage II of Phase III** by July 12, 2017.
- D19.2 When the Contractor considers the Work associated with Lily/Galt Gate Chamber Upgrades 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.

D20. SUBSTANTIAL PERFORMANCE

- D20.1 The Contractor shall achieve Substantial Performance by September 22, 2017.
- D20.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D20.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

D21. TOTAL PERFORMANCE

- D21.1 The Contractor shall achieve Total Performance by September 29, 2017.
- D21.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D21.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

D22. LIQUIDATED DAMAGES

- D22.1 If the Contractor fails to achieve 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 D19.1(a) – Three Thousand dollars (\$3,000.00);
 - (b) Critical Stage D19.1(b) – Three Thousand dollars (\$3,000.00);
 - (c) Critical Stage D19.1(c) – Three Thousand dollars (\$3,000.00);
 - (d) Substantial Performance – Three Thousand dollars (\$3,000.00);
 - (e) Total Performance – One Thousand Five Hundred dollars (\$1,500.00).
- D22.2 The amount specified for liquidated damages in D22.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Critical Stages, Substantial Performance, or Total Performance by the day fixed herein for same.
- D22.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D23. SCHEDULED MAINTENANCE

- D23.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:
- (a) Reflective Crack Maintenance as specified in CW 3250; and
 - (b) Landscape Maintenance as specified in E30.1;
- D23.2 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

D24. JOB MEETINGS

- D24.1 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.
- D24.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

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

- D25.1 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).

D26. THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA) – QUALIFICATIONS

- D26.1 Further to B12.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B12.4.

MEASUREMENT AND PAYMENT

D27. PAYMENT

- D27.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

D28. PAYMENT SCHEDULE

- D28.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D29. WARRANTY

- D29.1 Notwithstanding C13.2, the warranty period shall begin on the date of Substantial Performance and shall expire two (2) years thereafter unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

FORM H1: PERFORMANCE BOND
(See D12)

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. 27-2017

2017 Northeast Exchange District Street Renewal, Pacific Avenue and 1919 General Strike Monument 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 D12)

(Date)

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

RE: PERFORMANCE SECURITY – BID OPPORTUNITY NO. 27-2017

2017 Northeast Exchange District Street Renewal, Pacific Avenue and 1919 General Strike Monument

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 April 29, 2017

(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 D13)

2017 Northeast Exchange District Street Renewal, Pacific Avenue and 1919 General Strike Monument

<u>Portion of the Work</u>	<u>Name</u>	<u>Address</u>
Supply of Materials		
Concrete		
Asphalt		
Bas Course & Sub Base		
Underground Materials (Catch Basin, Catch Pit, Frame & Covers, ect.)		
Paving Stone		
Pedestrian Lighting		
Structural Steel		
Monument panels, interpretive text panels, and map panels		
Electrical Panels		
Installation/Placement:		
Concrete		
Asphalt		
Bas Course & Sub Base		
Underground Materials (Catch Basin, Catch Pit, Frame & Covers, ect.)		
Paving Stone		
Pedestrian Lighting		
Structural Steel		
Monument panels, interpretive text panels, and map panels		
Electrical Panels		

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

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

<u>Drawing No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
C00	COVER SHEET	A1
5515038-C-01	PACIFIC AVENUE STA. 0+96.51 TO STA. 1+90.00	A1
5515038-C-02	PACIFIC AVENUE STA. 1+90.00 TO STA. 2+76.87	A1
L1.1	PACIFIC AVENUE FROM MAIN STREET TO LILY STREET, MATERIALS & PLANTING PLAN	A1
L2.1	PACIFIC AVENUE FROM MAIN STREET TO LILY STREET, SIDEWALK SECTIONS	A1
L3.1	PACIFIC AVENUE FROM MAIN STREET TO LILY STREET, LAYOUT, PAVING & DETAILS	A1
5515038-GC-01	LILY STREET/GALT AVENUE INTERSECTION UNDERGROUND COMMUNOTOR STRUCTURE ROOF REPLACEMENT, DEMOLITION DETAILS	A1
5515038-GC-02	LILY STREET/GALT AVENUE INTERSECTION UNDERGROUND COMMUNOTOR STRUCTURE ROOF REPLACEMENT, NEW ROOF CONCRETE, REINFORCING AND MANHOLE ISOLATION DETAILS	A1
E1.0	ELECTRICAL SYMBOL LEGEND, DRAWING LIST & DETAILS	A1
E1.1	SITE PLAN – ELECTRICAL LAYOUT	A1
A0.0	COVER	11x17
A1.0	SITE PLAN	11x17
A2.0	PLAN & PILING PLAN	11x17
A3.0	ELEVATION & ROOF PLAN	11x17
A3.1	ELEVATIONS – MONUMENT	11x17
A3.2	ELEVATION – INTERP. PANEL	11x17
A3.3	ELEVATION – INTERP. PANEL	11x17
A4.0	SECTIONS MONUMENT	11x17
A4.1	SECTIONS MONUMENT	11x17
A5.0	DETAILS - MONUMENT	11x17
A6.0	ISOMETRICS - SITE	11x17
A6.1	MONUMENT FRONT VIEWS	11x17
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A7.2	MODULES A01 TO A07	11x17
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A7.5	MODULES B09 TO C02	11x17
A7.6	MODULES C03 TO C09	11x17
A7.7	MODULES C10 TO D03	11x17
A7.8	MODULES D04 TO D10	11x17
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E2. PROTECTION OF EXISTING TREES

- E2.1 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.

E2.2 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.

E2.3 No separate measurement or payment will be made for the protection of trees.

E2.4 Except as required in clause E2.1(c) and E2.1(e), Elm trees shall not be pruned at any time between April 1 and July 31.

E3. TRAFFIC CONTROL

E3.1 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.

E3.2 Notwithstanding E3.1, 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.

E3.2.1 An exception to E3.2 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.

E3.2.2 Further to E3.2, 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.

E4. TRAFFIC MANAGEMENT

E4.1 Further to clause 3.7 of CW 1130:

- (a) 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.

E4.1 Further to clause 3.7 of CW 1130:

E4.1.1 The Contractor shall schedule construction activities to meet the following:

- (a) Lily Street from Disraeli Freeway to Alexander Avenue will have one southbound lane maintained during construction.
- (b) Pacific Avenue from Main Street to Lily Street will have one eastbound lane maintained during construction
- (c) Maintain a minimum of one lane of traffic southbound and one lane of traffic northbound on Lily Street from Market Avenue to Alexander Avenue. When work is being performed on site essential intromit lane closures will be permitted;
- (d) Intersecting street and private approach access shall be maintained at all times.

E4.1.2 Flag persons may be necessary to maintain the flow of traffic during certain work operations.

E4.1.3 Should the Contractor be unable to maintain an existing 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 48 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.

E4.1.4 Pedestrian and ambulance/emergency vehicle access must be maintained at all times.

E5. REFUSE AND RECYCLING COLLECTION

E5.1 While access to refuse and/or recycling collection vehicles is restricted, on collection day(s) the Contractor shall move all of the affected property owners refuse and/or recycling materials to a nearby common area, prior to an established time, in accordance with E5.2 to permit the normal collection vehicles to collect the materials. Immediately following recycling collection the Contractor shall return recycling receptacles to the addresses marked on the receptacles.

E5.2 Collection Schedule:

Pacific Avenue from Main Street to Lily Street.

Collection Day(s): **Thursdays**

Collection Time: **6:00 a.m. – 6:00 p.m.**

Common Collection Area: **Refuse and Recycling is mixed, maintain access to back lanes and private approaches.**

E5.3 No measurement or payment will be made for the work associated with this specification.

E6. PEDESTRIAN SAFETY

E6.1 Construction of accessible walkway corridors will be fenced off and/or barricaded to prevent access from pedestrian traffic as directed by the contract administrator. No measurement for payment shall be made for this work.

E7. WATER OBTAINED FROM THE CITY

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

E8. SUPPLY AND INSTALLATION OF MOISTURE BARRIER/STRESS ABSORPTION GEOTEXTILE FABRIC

DESCRIPTION

E8.1 General

E8.1.1 This specification covers the supply and installation of Moisture Barrier/Stress Absorption Geotextile.

E8.1.2 Referenced Standard Construction Specifications
 .1 CW 3130 – Supply and Installation of Geotextile Fabrics.
 .2 CW 3410 – Asphaltic Concrete Pavement Works.

MATERIALS

E8.2 Mill Certificate and Bill of Lading

E8.2.1 Provide mill certificate and bill of lading in accordance with Section 2 of CW 3130.

E8.3 Storage and Handling

E8.3.1 Store and handle material in accordance with Section 2 of CW 3130.

E8.4 Moisture Barrier/Stress Absorption Geotextile Fabric

E8.4.1 Geotextile fabric will be non-woven.

E8.4.2 All physical property requirements are minimum average roll values determined in accordance with ASTM 4759. The moisture barrier/stress absorption geotextile fabric will meet or exceed the standards as follows:

PROPERTY	STANDARD	TEST METHOD
GrabTensile Strength	0.40 kN	ASTM D4632
Grab Elongation	50%	ASTM D4632
Mullen Burst	1240 Kpa	ASTM D3786

E8.4.3 Acceptable products will be Amoco-petromat 4599, ARMTEC PF1, NILEX-9W99, Scaps GC-130 or an approved equal.

E8.5 Tack Coat

E8.5.1 Tack coat will be 150 – 200 asphalt cement supplied in accordance with Clause 5.4.2 of CW 3410.

CONSTRUCTION METHODS

E8.6 General

- E8.6.1 Install moisture barrier/stress absorption geotextile fabric at the locations as shown on the Drawings or as directed by the Contract Administrator.
- E8.6.2 Proceed with installation upon completion and acceptance of the asphalt levelling course.
- E8.6.3 Ensure pavement surface is clean and free of all dirt, water, oil or foreign materials.
- E8.6.4 Apply tack coat with a distribution truck in accordance with manufacturer's specifications and recommendations. Ensure uniform coverage of entire pavement surface.
- E8.6.5 Install geotextile fabric in accordance with the manufacturer's specifications and recommendations.
- E8.6.6 Only construction equipment required to place the final asphalt surface course will be allowed to travel on the exposed geotextile fabric.
- E8.6.7 Replace damaged or improperly placed geotextile fabric.
- E8.6.8 All fabric installed must be covered with asphalt the same day.
- E8.6.9 Commence placement of asphalt material after the fabric has been placed over the full width of the pavement surface and accepted by the Contract Administrator.
- E8.6.10 Ensure temperature of asphalt material does not exceed the melting point of the fabric.

MEASUREMENT AND PAYMENT

E8.7 Moisture Barrier/Stress Absorption Geotextile Fabric

- E8.7.1 Supply and installation of Moisture Barrier/Stress Absorption Geotextile Fabric will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Moisture Barrier/Stress Absorption Geotextile Fabric". The area to be paid for will be the total number of square metres of geotextile fabric supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.
- E8.7.2 The supply and application of the tack coat will be included in the payment for "Moisture Barrier/Stress Absorption Geotextile Fabric".

E9. PARTIAL DEPTH PATCHING OF EXISTING JOINTS

DESCRIPTION

E9.1 General

- E9.1.1 This specification covers the Partial Depth Patching of existing concrete pavement joints.

E9.2 Referenced Standard Construction Specifications

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

MATERIALS

E9.3 Asphalt Materials

- E9.3.1 Asphalt material will be Type 1A supplied in accordance with Sections 5 and 6 of CW 3410.

E9.4 Tack Coat

- E9.4.1 Tack Coat will be undiluted SS-1 emulsified asphalt or approval equal.

CONSTRUCTION METHODS

E9.5 Planing of Joints

- E9.5.1 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.
- E9.5.2 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
- E9.5.3 Dispose of material in accordance with Section 3.4 of CW 1130.

E9.6 Placement of Asphalt Material

- E9.6.1 Prior to placement of asphalt material, the planed joint shall be swept or blow clean of any loose material.
- E9.6.2 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.
- E9.6.3 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.
- E9.6.4 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 %.
- E9.6.5 Ensure that no traffic is allowed to travel over the patched area until the asphalt has cooled to atmospheric temperature.

MEASUREMENT AND PAYMENT

E9.7 Partial Depth Planing of Existing Joints

- E9.7.1 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.

E9.8 Asphalt Patching of Partial Depth Joints

- E9.9 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.

E10. PATCHING OF EXISTING PAVEMENT

DESCRIPTION

E10.1 General

- E10.1.1 This specification covers patching of existing concrete pavement in preparation for an asphalt overlay.
- E10.1.2 Referenced Standard Construction Specifications
- (a) CW 3110 – Sub-Grade, Sub-Base and Base Course Construction.
 - (b) CW 3130 – Supply and Installation of Geotextile Fabrics.
 - (c) CW 3410 – Asphaltic Concrete Pavement Works.

MATERIALS

E10.2 Crushed Sub-Base Material

E10.2.1 Crushed Sub-base material will have a maximum aggregate size of 50 millimetre and be supplied in accordance with Section 2.1 of CW 3110.

E10.3 Geotextile Fabric

E10.3.1 Geotextile fabric will be supplied in accordance with Section 2 of CW 3130.

E10.4 Asphalt Material

E10.4.1 Asphalt material will be Type 1A and will be supplied in accordance with Sections 5 and 6 of CW 3410.

CONSTRUCTION METHODS

E10.5 General

E10.5.1 Remove existing concrete pavement to a minimum width of 1.5 metres at locations as shown on the Drawings or as directed by the Contract Administrator in accordance with Section 3.1 of Specification CW 3110.

E10.5.2 Excavate to a depth of 350 millimetres below the top of the existing pavement.

E10.5.3 Compact existing sub-grade to a minimum of 95% Standard Proctor Density.

E10.5.4 Place separation/reinforcement geotextile fabric in accordance with Specification CW 3130.

E10.5.5 Place and compact crushed sub-base material in accordance with CW 3110 to a 300 millimetres compacted depth. Compact to a minimum of 100% Standard Proctor Density.

E10.5.6 Place and compact asphalt material to a 50 millimetres compacted depth matching the top of the existing concrete pavement. Compact to an average of 95% percent of the 75 Blow Marshall Density of the paving mixture with no individual test being less than 90% percent.

E10.5.7 Each layer must be levelled and accepted by the Contract Administrator before the succeeding layer may be placed.

E10.5.8 Additional excavation and placement of sub-base material beyond the identified pavement structure will be completed in accordance with CW 3110 as directed by the Contract Administrator.

MEASUREMENT AND PAYMENT

E10.6 Pavement Patching

E10.6.1 Pavement patching will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Pavement Patching". The area to be paid for will be the total number of square metres of pavement patched in accordance with this specification, accepted and measured by the Contract Administrator.

E11. MATERIALS SUPPLIED BY THE CITY

E11.1 The City will supply the following materials:

E11.1.1 Materials:

(a) None

E12. MOBILIZATION AND DEMOBILIZATION

- E12.1 Mobilization and Demobilization will include but not be limited to start-up costs, equipment setup and removal, field office and storage facilities set-up, removal and site cleanup.
- E12.2 Mobilization and Demobilization will not be measured and shall be included in the lump sum cost for "Cast-In-Place Concrete Gate Chamber Upgrades".

E13. TRUCK WEIGHT LIMITS

- E13.1 The City shall not pay for any portion of material which results in the vehicle exceeding the maximum gross vehicle weight allowed under The City of Winnipeg Traffic By-Law, unless such vehicle is operating under special permit.

E14. DANGEROUS WORK CONDITIONS

- E14.1 The Contractor shall be aware that underground chambers, manholes, and sewers are considered a confined space and shall follow the "Guidelines for confined Entry Work" as published by the Manitoba Workplace Safety and Health Division. Prior to the commencement of any work, the Contractor shall submit a Safety and Health – Safe Work Plan to the Contract Administrator for review and acceptance by the City.
- E14.2 The Contractor shall be aware of the potential hazards that can be encountered in gate chambers, manholes and sewers such as explosive gases, toxic gases and oxygen deficiency.
- E14.3 The air in a confined space must be tested before entry and continuously during the time that personnel are inside the space. Equipment for continuous monitoring of gases must be explosion-proof and equipped with a visible and audible alarm. The principal tests are for oxygen deficiency, explosion range and toxic gases. Testing equipment must be calibrated in accordance with manufacturer's specifications.
- E14.4 The Contractor shall ventilate all confined spaces including underground chambers, tunnels, pipes and shafts as required and approved by the Manitoba Workplace Safety and Health Act (the "Act"). If no ventilation is supplied, a Worker must wear a respirator or supplied air to enter the confined space.
- E14.5 Workers must wear a respirator or supplied air at all times when entering a chamber, manhole or sewer where live sewage is present.
- E14.6 If products containing volatile organic carbons (VOCs) are used, the Contractor shall provide a photoionization detector (PID) on Site to monitor potential VOCs in the confined spaces. The gas detector and safety equipment conforming to the Act shall be made available to the Contract Administrator for his use during inspections. In addition, the Contract Administrator may collect discrete air samples for laboratory analysis.
- E14.7 The Contract Administrator may issue a Stop Work order to the Contractor if the above guidelines are not being followed. The Contractor shall not resume his operations until the Contract Administrator is satisfied the Contractor is following the appropriate procedures. The Contractor shall have no claim for extra time or costs due to the Stop Work order for not following these safety guidelines.

E15. SHOP DRAWINGS

- E15.1 Description
- (a) This Specification shall revise, amend and supplement the requirements of CW1110.
- (i) The term 'shop drawings' means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, including site erection drawings which are to be provided by the Contractor to illustrate details of a portion of the work.

- (ii) The Contractor shall submit specified shop drawings to the Contract Administrator for review. All submissions must be in metric units. Where data is in imperial units, the metric equivalent shall also be on all submissions for Engineering review.
- (b) Shop Drawings
- (i) Original drawings are to be prepared by Contractor, Subcontractor, supplier, distributor, or manufacturer, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate sections.
 - (ii) Shop drawings for the following structural components shall bear the seal of a Professional Engineer registered to practice in the Province of Manitoba.
 - (a) Shoring;
 - (b) Reinforcing steel;
- (c) Contractor's Responsibilities
- (i) Review shop drawings, product data and samples prior to submission and stamp and sign drawings indicating conformance to the Contract requirements.
 - (ii) Verify:
 - (i) Field Measurements
 - (ii) Field Construction criteria
 - (iii) Catalogue numbers and similar data
 - (iii) Coordinate each submission with requirements of Work and Contract Documents. Individual shop drawings will not be reviewed until all related drawings are available.
 - (iv) Notify Contract Administrator, in writing at time of submission, of deviations from requirements of Contract Documents
 - (v) Responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator's review of submission, unless the Contract Administrator gives written acceptance of specified deviations.
 - (vi) Responsibility for errors and omissions in submission is not relieved by the Contract Administrator's review of submittals.
 - (vii) The Contractor shall make any corrections required by the Contract Administrator and shall resubmit the required number of corrected copies of Shop Drawings. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Contract Administrator on the previous submission.
 - (viii) After Contract Administrator's review and return of copies, distribute copies to subtrades as required.
 - (ix) Maintain one (1) complete set of reviewed shop drawings, filed by Specification Section Number, at the site of the work for use and reference of the Contract Administrator and Subcontractors.
- (d) Submission Requirements
- (i) Schedule submissions at least 7 Calendar days before dates reviewed submissions will be needed, and allow for a 7 Calendar day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.
 - (ii) Submit five (5) paper prints of shop drawings. The Contractor is advised that the Contract Administrator will retain three (3) copies of all submittals and return two (2) copies to the Contractor.
 - (iii) Accompany submissions with transmittal letter, containing:
 - (i) Date
 - (ii) Project title and Bid Opportunity Number
 - (iii) Contractor's name and address
 - (iv) Number of each shop drawing, product data and sample submitted
 - (v) Specification Section, Title, Number and Clause

- (vi) Drawing Number and Detail/ Section Number
- (vii) Other pertinent data
- (iv) Submission shall Include:
 - (i) Date and revision dates.
 - (ii) Project title and Bid Opportunity number.
 - (iii) Name of:
 - (i) Contractor
 - (ii) Subcontractor
 - (iii) supplier
 - (iv) manufacturer
 - (v) separate detailer when pertinent
 - (iv) Identification of product of material.
 - (v) Relation to adjacent structure or materials.
 - (vi) Field dimensions, clearly identified as such.
 - (vii) Specification section name, number and clause number or drawing number and detail/section number.
 - (viii) Applicable standards, such as CSA or CGSB numbers.
 - (ix) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract Documents.
- (e) Other Considerations
 - (i) Fabrication, erection, installation or commissioning may require modifications to equipment or systems to conform to the design intent. Revise pertinent shop drawings and resubmit.
 - (ii) Material and equipment delivered to the site of the works will not be paid for at least until pertinent shop drawings have been submitted and reviewed.
 - (iii) Incomplete shop drawing information will be considered as stipulated deductions or the purposes of progress payment certificates.
 - (iv) No delay or cost claims will be allowed that arise because of delays in submission, re-submissions and review of shop drawings.

E15.2 Measurements and Payment

- (a) Preparation and submittal of Shop Drawings shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

E16. SITE DEVELOPMENT AND RESTORATION

E16.1 Description

- (a) This Specification shall supplement the requirements of CW1130.
- (b) This Specification shall cover all aspects of the Site Development and Restoration Work, including:
 - (i) Erection, maintenance and removal of safety fencing;
 - (ii) Snow clearing;
 - (iii) General access development;
 - (iv) Start-up costs;
 - (v) Equipment setup and removal;
 - (vi) Access maintenance; and
 - (vii) Site restoration.

E16.2 Materials

E16.2.1 Equipment

All equipment, implements, tools and facilities used shall be of a size and type as required to complete the Work in a reasonable time, approved by the Contract Administrator. The Contractor shall keep all equipment in good working order, and have sufficient standby equipment available at all times, as required.

E16.3 Construction Methods

E16.3.1 Site and Construction Access

The Contractor shall be responsible to develop suitable Site access. This includes but is not limited to, temporary bridging over structures, temporary removal and reinstallation of safety fencing, any landscaping and grading repairs, restoration of vegetation, etc. necessary to restore any Site and construction access area to their pre-existing condition.

E16.3.2 Site Security

At the end of each Work Day, all excavations and underground structure openings shall be secured to prevent access. Safety fence shall also be closed and secured to prevent public access.

E16.4 General Site Cleanup and Restoration

All areas of the construction Site shall be restored to a condition at least equivalent to its original condition prior to initiation of Work. This may include, but is not necessarily limited to the Contractor's lay down area, and removal of all temporary fencing.

E16.5 Method of Measurement and Payment

- (a) Site Development and Restoration shall be considered incidental to the Works of this Contract and no measurement or payment will be made for this item.

E17. PROTECTION OF EXISTING STRUCTURES

E17.1 The Contractor shall take all precautions to prevent damage to existing structures and adjacent property. In the event of damage, the Contractor will be held liable, and shall be required to provide appropriate restoration at his cost, to the satisfaction of the Contract Administrator.

E17.2 A third party representative of the Contractor having a minimum of three (3) years of residential inspection experience to the satisfaction of the Contract Administrator shall carry-out a pre-construction inspection of adjacent properties and structures to fully catalogue all existing conditions prior to the commencement of any Site construction activities. This inspection will serve as a baseline of existing conditions in the event of damage claims due to construction activities.

E17.3 The pre-construction inspection shall include both interior and exterior inspections of the residential house immediately west side of the Work Site as identified by the Contract Administrator. The inspection shall document all existing conditions including:

- (i) Photographic and written documentation of all existing interior condition of house along the east side of the structure, including drywall or plaster cracking, chipping or other existing damage observed. Measurements of existing damage shall be made, including length, width and depths as appropriate.
- (ii) Photographic and written documentation of all existing exterior conditions along the east face of the structure. The inspector shall comment on any observed damage and take measurements as appropriate.
- (iii) Photographic and written documentation of any visible existing foundation damage.

E17.4 The City of Winnipeg will be responsible for distribution of a notification letter indicating that a representative of the Contractor is requesting access to the property for inspection

- E17.5 The inspection shall be completed with the assistance of the property owner. Following completion of the inspection, the inspector shall review all inspection findings with the owner and have the owner sign and date the report.
- E17.6 The resulting inspection report, including all photographs shall be submitted to the Contract Administrator following completion. The property owner shall receive a duplicate copy of the inspection report.
- E17.7 Access to and inspection of private property shall be only by personnel having submitted a valid background check in accordance with Part F of these specifications and reviewed by the Contract Administrator.
- E17.8 The Contractor is advised that two (2) vibration monitors shall be installed by a testing contractor concurrently with any on site work associated with this Contract. These instruments shall be set up at two separate locations immediately adjacent to the Work Site.
- E17.9 The vibration monitor data will be reviewed at regular intervals throughout construction to ensure that construction-induced vibrations are kept below established threshold values to preclude aesthetic and structural damage to adjacent properties.
- E17.10 The City of Winnipeg will be responsible for distribution of a notification letter indicating that the Contractor is requesting access to the property for purposes of installation of a vibration monitor.
- E17.11 Access to private property shall be only by personnel having submitted a valid background check in accordance with Part F of this specification, to the satisfaction of the Contract Administrator.
- E17.12 Measurement and Payment
- (a) Pre-construction inspections shall be measured on a lump sum basis and paid for at the Contract Lump Sum Price for "Pre-Construction Inspections." Said price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.
 - (b) Allowance for vibration monitoring will be measured on a lump sum basis and paid for at the Contract Lump Sum price for "Vibration Monitoring Allowance." Said price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E18. CAST-IN-PLACE CONCRETE GATE CHAMBER UPGRADES

E18.1 Description

- E18.1.1 This specification will cover demolition and reconstruction of a cast-in-place concrete gate chamber roof and shall supplement, revise and amend CW 2160.

E18.2 Materials

(a) Concrete Mix Design

The Contractor shall be responsible for the design and performance of all concrete mixes supplied under this Specification. Concrete shall be supplied in accordance with the requirements of CSA A23.1-14 (with the exception of air content), with the minimum properties as provided below:

- (i) Cast-In-Place Concrete Gate Chamber Construction
 - Class of Exposure S-1
 - Maximum Size of Aggregate 20 mm

Cement Type	Type HS
Maximum Water/Cementing Materials Ratio	0.40
Compressive Strength at 7 Days	20 MPa
Compressive Strength at 56 Days	35 MPa
Slump/Flow	80 mm +/- 20 mm
Air Content	5.0% to 8.0%

(ii) Lean Mix Concrete

Cement Type	Type HS
Maximum Water/Cementing Materials Ratio	0.49
Compressive Strength at 28 Days	15 MPa
Slump/Flow	80 mm
Air Content	nil

(b) Provide a "Mix Design Statement" for each type of concrete to be used certifying constituent materials and mixing proportions to the Contract Administrator at least 2 weeks prior to delivery of Concrete to the Site. Supply reasonable evidence to the Contract Administrator that the mix proportions selected will produce concrete meeting the specified strength, workability and yield.

(c) Admixtures

- (i) All admixtures shall be compatible.
- (ii) Air entraining agent shall meet ASTM C260.
- (iii) Chemical water reducing admixtures shall meet ASTM C494.

(d) Epoxy Grout

- (i) Grout shall be Sika AnchorFix-2001 or approved equivalent

(e) Reinforcing Steel

- (i) Bar accessories:
 - To be made of a non-corroding material
 - Shall not stain, blemish or spall the concrete surface for the life of the concrete
 - Shall be approved by the Contract Administrator
 - Bar chairs shall be PVC.

(f) Bonding Agent shall be Sika Latex R or approved equivalent in accordance with B7.

(g) Waterproofing

- (i) Waterproofing shall be in accordance with E20 of this specification.

(h) Manhole Frames and Covers

- (i) Cover: Unmarked Titan TF-114-5" cast iron solid cover.
- (ii) Frame: 127-millimetre high cast iron frame.

(i) Shop Drawings:

- (i) Provide shop drawings in accordance with E8 of this specification.
- (ii) Submit shop drawings for reinforcing steel a minimum of two (2) weeks prior to the fabrication of any reinforcing steel.

(j) Backfill

- (i) In accordance with CW 2030. Class of backfill to be as shown on the Drawings.

E18.3 Construction Methods

E18.3.1 Construction Method Submission

- (i) No Work shall commence on construction of cast-in-place concrete chamber until after the Contract Administrator's review of the Contractor's Construction Method submission.
- (ii) Excavation for the construction of the gate chambers shall be by the shored excavation method.
- (iii) The Contractor shall prepare for the Contract Administrators review a Construction Method submission detailing:
 - (i) Construction sequence to be followed including all methods to be employed.
 - (ii) Shoring system to be used.
 - (iii) Proposed method of gate chamber demolition and reconstruction.
 - (iv) Specialized equipment to be used.
 - (v) Any design revisions proposed to accommodate the Contractor's proposed construction method.
 - (vi) Water control consideration including details on the Contractor's proposed method of groundwater and surface runoff control.
- (i) The Contractor shall respond to any concerns that may be raised by the Contract Administrator after review of Construction Method submission.

E18.3.2 Cast-in-place Concrete Gate Chamber Roof Construction

- (a) Demolish the existing gate chamber roof and walls to the limits shown on the drawings.
- (b) The Contractor shall take special care to avoid damaging existing structures during the course of the Work. Any damage caused by the Contractor to the structure shall be repaired by the Contractor, at the Contractor's cost, to the satisfaction of the Contract Administrator.
- (c) Construct cast in place concrete gate chamber roof in accordance with CW 2160, except as supplemented, revised or amended in this specification and as indicated in the construction notes on the Drawings.
- (d) Adjust the location of reinforcing steel adjacent to openings to frame those openings in accordance with good practice, and maintain the bar spacing intent.
- (e) Do not use welded splices for reinforcing steel.
- (f) Install foundation waterproofing in accordance with E20 of this Specification and as detailed on the Drawings.
- (g) The Contractor shall note that existing formwork may be present around the existing gate chamber and will have to be removed prior to construction of the gate chamber at the Contractor's expense.

E18.3.3 Backfill

- (ii) Place and compact backfill material as indicated in the drawings and in accordance with CW 2030.
- (iii) Do not place backfill material in a frozen state.
- (iv) Supply heating and hoarding in accordance with CW 2160 if required to ensure material does not freeze before compaction is complete.
- (v) Notify the Contract Administrator at least one (1) full Working Day in advance of any backfilling operation. No Backfill shall be placed against concrete until approved by the Contract Administrator and in no case before field cured test cylinders show the concrete strength to be 75% of that specified.

E18.3.5 Epoxy Grout

- (a) Mix and apply grout in accordance with the manufacturer's instructions. Consistency is to be suitable for the intended application

E18.4 Measurement and Payment

- (a) Construction of the cast-in-place concrete gate chamber will be paid for at the Contract Lump Sum Price for "Cast-In-Place Concrete Gate Chamber Upgrades." Said price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this specification.

E19. COLD WEATHER REQUIREMENTS

E19.1 Should any concrete Work be required to be carried out when the daily mean temperature is below 5°C or anticipated to be below 5°C within the next 24 hours, cold weather requirements will be specified herein.

E19.2 All freshly placed concrete shall be protected from the elements and from defacements due to construction operations.

E19.3 The following are minimum requirements for protecting concrete during and after placement during freezing weather, but mere adherence to these requirements will not relieve the Contractor of the necessity for producing concrete which has not been weakened or injured by frost or freezing, or replacing such damaged Work at no additional cost to the City;

- (a) Before any concrete is placed, all ice, snow, and frost shall be completely removed from all formwork, and other surfaces against which concrete temperatures of such surfaces raised above 7°C for twenty-four (24) hours minimum prior to concreting. Where concrete Work is to come in contact with the earth, the surface of the earth shall be completely free of frost when concrete is placed thereon.
- (b) Concrete aggregates shall be heated to not over 80°C. Concrete shall be not less than 20°C or more than 30°C in temperature when deposited. Concrete when placed during cold weather, or if cold weather is anticipated during curing period, shall be fully enclosed and the temperature of same maintained at not less than 20°C for five (5) days nor less than 5°C for an additional five (5) days.
- (c) Heating enclosures shall be strong and wind-proof, well ventilated with heating units so located as to prevent local overheating or drying of the concrete or damage from combustion gases. Only indirect fired heaters will be accepted. Units must be vented outside the enclosure. No direct fired units will be accepted.
- (d) The Contractor shall inform the Contract Administrator well in advance as to the methods of enclosure and frost protection he proposes to employ.

E19.4 Measurement and Payment

- (a) Cold weather requirements shall be considered incidental to the Contract Lump Sum Price for "Cast-In-Place Concrete Gate Chamber Upgrades" and no separate payment will be made for this item.

E20. FOUNDATION WATERPROOFING

E20.1 Description

(a) General

- (i) This Specification shall cover the supply and placement of underground concrete gate chamber foundation waterproofing.

E20.2 Materials

- (i) Waterproofing membrane: Styrene-Butadiene-Styrene (SBS) elastomeric polymer, prefabricated sheet, reinforced with non-woven polyester weighing 180 g/m². Top

surface polyethylene film. Bottom surface: thermofusible plastic film. Acceptable material: Soprema Sopralene Flam 180, IKO Aquabarrier TG or approved equal.

- (ii) Primes, mastic sealant and accessories: as recommended by membrane manufacturer, applicable for substrate.
- (iii) Protection board: insulating fibreboard to CAN/CSA-A247, Type II, 12 millimetres thick.

E20.3 Construction Methods

E20.3.1 Quality Assurance

- (i) Installation of waterproofing membrane shall be performed by workers approved and trained by manufacturer for application of its products. Applicators must have minimum 5 years proven experience. If requested, submit proof of experience, in writing, from manufacturer.

E20.3.2 Warranty

- (a) Provide written warranty, signed and issued in the name of The City of Winnipeg stating that the waterproofing is guaranteed against leaking, loss of adhesion, for a period of five (5) years from the date of acceptance.

E20.3.3 Environmental Requirements

- (i) Maintain air temperature and structural base temperature at installation area above membrane manufacturer's recommendations before, during and 72 hours after installation.
- (ii) Applications in cold weather shall not commence until authorized by membrane manufacturer.
- (iii) For enclosed applications ensure adequate forced air circulation during curing period.
- (iv) Install membrane on dry substrates, free of snow and ice. Use only dry materials and apply only during weather that will not introduce moisture beneath waterproofing membrane.

E20.3.4 Preparation

- (i) Examine substrates and site conditions to ensure acceptability for application of waterproofing membranes. Notify Contract Administrator, in writing, of unsuitable surfaces or working conditions.
- (ii) Do not commence application until all other work that will penetrate membrane is complete.
- (iii) Clean substrates of all snow, ice, loose particles, oil, grease, dirt, curing compounds, or other foreign matter detrimental to application of primers and waterproofing membranes.
- (iv) Ensure concrete surfaces are fully cured and dry using test methods recommended by membrane manufacturer.
- (v) Repair defects in concrete surfaces such as spalled or poorly consolidated concrete. Remove sharp protrusions, sharp edges and form lines.
- (vi) Patch rough areas with a weld-adhered parge coat to provide smooth surface. Allow to fully cure and dry.

E20.3.5 Priming

- (i) Apply primer in accordance with manufacturer's instructions at recommended rate of application.
- (ii) Do not apply primer to frozen or damp surfaces.
- (iii) Apply primer only when air and surface temperatures are within manufacturer's recommended limits.
- (iv) Avoid pooling of primer and allow to cure until tack-free.
- (v) Prime only the area to be covered with membrane in a working day. Re-prime areas not covered with waterproofing within 24 hours of application of primer.

E20.3.6 Membrane Application

- (i) Apply membrane in accordance with manufacturer's instructions and with good construction practice to maintain continuity of waterproofing over building elements below finished grade elevation.
- (ii) Place membrane in position without stretching, taking care to avoid trapped air, creases or fish mouths.
- (iii) Ensure membrane is totally bonded to substrate.
- (iv) Apply membrane in longest possible lengths to reduce number of end joints.
- (v) Overlap side laps minimum 75 millimetres and end laps minimum 150 millimetres. Stagger end laps minimum 300 millimetres in adjacent rows.
- (vi) Seal all terminations by applying heavy pressure to edges with a roller to ensure positive bond. Apply a continuous bead of mastic sealant to all terminations. Make watertight. Seal daily terminations with mastic sealant.
- (vii) Terminate membrane 500 millimetres below construction joints as shown on drawings.

E20.3.7 Membrane Application at Corners

- (i) Remove sharp or protruding edges from external corners prior to application of membrane.
- (ii) Reinforce external corners with cushion strip of membrane minimum 300 mm wide at each corner. Install cushion strip below main membrane.

E20.3.8 Membrane Application Over Protrusions and Penetrations

- (i) Apply two layers of membrane flashing around protrusions and extend at least 150 millimetres in all directions. Cut and fit membrane neatly and snug fitting, leave no gaps. Seal all terminations with mastic sealant. Flash protrusions with liquid mastic extending 150 millimetres along protrusions.
- (ii) Seal with liquid mastic all protrusions or difficult detail areas which do not allow easy installation of membrane. Make watertight.

E20.3.9 Inspection and Repair

- (iii) Inspect membrane thoroughly before covering and make corrections immediately.
- (iv) Patch and repair misaligned or inadequately lapped seams, tears, punctures or fishmouths.
- (v) Patch with piece of waterproofing membrane and extend minimum 150 millimetres in all directions from fault and seal edges with mastic sealant.

E20.3.10 Protection Board

- (vi) Install protection board against all waterproofing membranes to protect against backfilling operations.
- (vii) Install boards vertically without fasteners or adhesives.
- (viii) Install protection board during backfilling operations to allow backfill materials to hold protection board tight to waterproofing membrane.
- (ix) Terminate protection board 500 millimetres below construction joints as shown on drawings

E20.4 Measurement and Payment

- (a) Supply and installation of waterproofing membrane and protection board shall be included in the Contract Lump Sum price for "Cast-in-Place Concrete Gate Chamber Upgrades" and no separate payment will be made for this item.

E21. METAL FABRICATIONS

E21.1 Description

(a) General

- (a) This Specification shall cover the supply, fabrication, transportation, handling, delivery and placement of metal fabrications including but not limited to the Public Monument to the 1919 Winnipeg General Strike.

E21.2 Materials

- E21.2.1 All material shall be of a type acceptable to the Contract Administrator, and shall be subject to inspection and testing by the Contract Administrator.
- E21.2.2 Material intended for use in the various assemblies shall be new, straight, and clean with sharply defined profiles.
- E21.2.3 Steel Sections and Plates: to CAN/CSA G40.20/G40.21, Grade 300 W, except W, HP AND HSS sections, which shall be Grade 350 W.
- E21.2.4 Steel Pipe: to ASTM A53/A53M, seamless, galvanized, as specified by item.
- E21.2.5 Welding materials: to CSA W59.
- E21.2.6 Hot dipped galvanized steel repair material: Galvalloy and Gal-Viz
- E21.2.7 Anchor bolts and fasteners: ASTM A276, Type 316 stainless steel, of ample section to safely withstand the forces created by operation of the equipment or the load to which they may be subjected.
- E21.2.8 All exposed steel in the Public Monument to the 1919 Winnipeg General Strike to be of weathering steel, to ASTM standards A588, A242, and A606-4. Sizes, gauges, thicknesses, sections, and shapes as per architectural and structural engineering drawings.
- E21.2.9 Exposed "rivets" on the monument panels as per architectural drawing A7.0, and numbers on the map panels as per architectural drawing A3.3, are to be fabricated of solid brass to ASTM standard B-121 and UNS C360.

E21.3 Construction Methods

E21.3.1 Submittals

- (a) The Contractor shall submit the qualifications of the fabricator and welders to the Contract Administrator for acceptance. Submit shop drawings in accordance with E15 clearly indicating material, core thickness, finishes, connections, joints, methods of anchorage, number of anchors, supports, reinforcement, details and accessories. Indicate field measurements on shop drawings.

E21.4 Fabrications

- (a) Fabricate Work square, true, straight and accurate to required size, with joints close fitted and properly secured. Assemble Work in such a way that no disfigurements show in the finished Work, or impair the strength.
- (b) Confirm measurements for all fabrications before fabricating.
- (c) Pieces shall be of the sizes indicated on the Drawings and shall not be built up from scrap pieces. Confirm sizes with field measurements,
- (d) Where possible, fit Work and shop assemble, ready for erection.
- (e) Remove and grind smooth burrs, filings, sharp protrusions, and projections from metal fabrications to prevent possible injury. Correct any dangerous or potential harmful installations as directed by the Contract Administrator.
- (f) All steel welding shall conform to CSA Standard W.59. Fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with CSA Standard W.47.1. Welding shall be done by currently licensed welders only.
- (g) Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- (h) Seal exterior steel fabrications to provide corrosion protection in accordance with CAN3-S16.1.
- (i) Letters and other shapes are to be cut into steel panels using laser or plasma cutter. All cut edges to be even and square, and smooth to the touch. All excess material to be fully and cleanly removed.

- (j) All edges of the raised sections of the map panels to be cut even and square, and smooth to the touch. All excess material to be fully and cleanly removed.
- (k) All exposed steel and brass on the Public Monument to the 1919 Winnipeg General Strike to receive no final finishing applications.

E21.5 Erection

- (a) Do steel welding Work in accordance with CSA W59.
- (b) Erect metal Work in accordance with reviewed shop drawings, square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- (c) Provide suitable means of anchorage acceptable to Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles where not specifically indicated on the Drawings.
- (d) Provide components for building in accordance with shop drawings and schedule.
- (e) Touch-up rivets, bolts and burnt or scratched surfaces that are to receive paint finish, with zinc primer after completion of erection.
- (f) Repair damaged galvanized surfaces and field welds with self-fluxing, low temperature, zinc-based alloy rods in accordance with ASTM A780, Repair of Damaged Hot Dip Galvanizing Coatings. The general procedure shall be to allow a small amount of the repair alloy to flow then spread by brushing briskly with a wire brush. Brushing shall be sufficient to obtain a bright finish. Repeat process three times to ensure a proper thickness is achieved. Temperatures shall be kept below 177°C (350°F) at all times. All heating of structural steel Work shall be done in the presence of the Contract Administrator.

E21.6 Measurement and Payment

- (a) Supply, fabrication, transportation, handling, delivery and placement of metal fabrications will be included in the Contract Lump Sum price for "Cast-in-Place Concrete Gate Chamber Upgrades" and no separate payment will be made for this item.

E22. TEMPORARY SURFACE RESTORATION AND MAINTENANCE

- E22.1 Further to CW 1130, if the Contractor fails to maintain disturbed surfaces as directed and within the time period given by the Contract Administrator, the City or its designate may perform the work required and the cost may be deducted from payments owed.
- E22.2 The Contractor shall monitor and maintain temporarily restored surfaces as required until permanent restoration is complete.
- E22.3 If, in the opinion of the Contract Administrator, temporarily restored surfaces are not being adequately maintained or were not properly constructed and pose a danger to the public, maintenance or reconstruction will be done by the City forces with no advance notification to the Contractor.
- E22.4 Temporary Surface Restoration and Maintenance shall be considered incidental to the Works of this Contract and no separate payment will be made for this item.

E23. SNOW CLEARING

- E23.1 All required snow clearing shall be performed by the Contractor at their own expense.
- E23.2 The Contractor will be required to perform snow clearing and sanding operations on City streets and sidewalks within the Site where access to City snow clearing and sanding crews is blocked due to construction activities or where construction activities have created unsafe, icy conditions.
- E23.3 Snow built-up on sidewalks and roadway shall be maintained to the condition of the surrounding sidewalks and roadways.

E24. TREE VAULTS

E24.1 Description

E24.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of tree vaults with precast concrete vault covers and related excavation, granular drainage material, drainage pipe, non-woven geotextile, and planting medium.

E24.2 Materials

E24.2.1 Granular drainage material in accordance with specification CW3120 - Installation of Sub Drains.

E24.2.2 Drainage pipe: 150mm dia. perforated PVC pipe.

E24.2.3 Non-woven geotextile to CW3120.

E24.2.4 Concrete materials and accessories in accordance with Specification CW 3310 – Portland Cement Concrete Pavement Works, to suit loads designed by Structural Engineer.

E24.2.5 Precast Concrete Vault Cover

(a) 1245 x 1242 x 150mm reinforced precast concrete vault cover, medium sandblast finish, to accommodate AASHTO HS-20 loading, including 4-19mm plastic lift rings and 4-19mm PVC pipe SCH 40 bottom, drilled thru.

(b) Available from Barkman Concrete Ltd. Ph. 204-667-3310, or approved equal.

E24.2.6 Planting medium in accordance with Planting Medium and Finished Grading specification.

E24.3 Submittals

E24.3.1 Prior to construction, submit samples of the following materials to the Contract Administrator:

(a) Shop drawing for vault cover stamped by and Engineer.

(b) Non-woven geotextile: 1 sq. m.

E24.3.2 Prior to installation, arrange for inspection and approval of the following materials by the Contract Administrator:

(a) One (1) precast concrete vault cover.

E24.4 Construction Method

E24.4.1 The Contractor must ensure that all buried utilities and services are located and, if necessary, protected and exposed prior to any excavation in accordance with specification CW1120.

E24.4.2 Obtain approval of tree grate with frame mock-up from Contract Administrator prior to construction of tree vaults. Refer to Exterior Metal Fabrication specification.

E24.4.3 Excavate tree vaults to the dimensions and depth shown on the Drawings. Soft dig / day lighting process to be used in area of existing underground utilities. Ensure base of tree pit slopes to drain toward perforated drainage pipe (min 1.0% slope).

E24.4.4 Clear excavation of all construction debris, trash, rubble and any foreign material. Excavate and remove oil spills and other soil contamination sufficiently to remove the harmful material. Fill over excavations with approved fill and compact to the required subgrade compaction.

E24.4.5 All excavated material shall be disposed of off site in accordance with specification CW1130.

E24.4.6 Backfill between roadway base gravel and tree vault edge with compacted granular where required.

- E24.4.7 Install 200mm depth granular drainage material with drainage pipe in accordance with specification CW3120, and as shown on the Drawings. Ensure pipe has minimum 25mm cover of drainage course above and below. Tie drainage pipe into nearest catch basin (min 0.25% slope).
- E24.4.8 Cover drainage course and sides of tree vault with geotextile in accordance with specification CW3120 and as shown on the Drawings.
- E24.4.9 Install soil mound, planting medium and trees.
- E24.4.10 Install vault covers on tree vault thickened edge. Remove debris from lip and/or grind down concrete as required to ensure vault covers do not wobble and are flush with adjacent surfaces.

E24.5 Measurement and Payment

- E24.5.1 Construction of Tree Vaults will be measured on a volume basis and paid for at the Contract Unit Price per cubic metre. The quantity to be paid for will be the total volume constructed in accordance with this specification, accepted and measured by the Contract Administrator. Tree Vault pricing includes excavation, granular drainage material, geotextile and root barrier. Over-excavation will not be paid.
- E24.5.2 Supply and install of precast concrete vault covers will be measured on a unit each basis. Price shall be payment in full for supplying materials and for performing the Work.
- E24.5.3 Drainage pipe shall be paid for on a lineal metre basis. Price shall be payment in full for supplying materials and for performing the Work.

E25. UNIT PAVING

E25.1 Description

- E25.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of unit pavers and brick pavers as indicated on the Drawings.

E25.2 References

- E25.2.1 CW 3330 – Installation of Interlocking Paving Stones
- E25.2.2 CW 3335 – Installation of Interlocking Paving Stones on a Lean Concrete Base

E25.3 Materials

E25.3.1 Unit Pavers:

- (a) 300 x 151 x 100mm Broadway paver, running bond, mahogany colour – pedestrian crossings.
- (b) Available from Barkman Concrete Ltd. Ph. 204-667-3310, or approved equal.

E25.3.2 Brick Pavers:

- (a) 194 x 93 x 57mm Endicott paver, running bond, dark ironspot.
- (b) Available from Alsip's Building Products and Services Ph. 204-667-3330, or approved equal.

E25.3.3 Bedding Sand

- (a) Bedding sand shall be fine aggregate to the requirements of specification CW3330.

E25.3.4 Joint Sand

- (a) Joint sand to the requirements of specification CW3330.

E25.4 Construction Method

- E25.4.1 Contractor to verify the exact dimensions of unit pavers and brick pavers prior to the construction of blockouts in concrete sidewalk. Have unit paver and brick pavers on site for reference when constructing blockouts.
- E25.4.2 Install concrete sidewalk w/blockouts and approaches w/blockouts as specified on Drawings.
- E25.4.3 Sidewalk indicator strip blockouts must be in direct alignment with approach indicator strip blockouts.
- E25.4.4 Preparation of Sand Base
- (a) Verify with Contract Administrator that drains and geotextile fabric are installed in pedestrian crossing blockouts.
 - (b) Remove all accumulated debris from blockouts.
 - (c) Install bedding sand to the depths indicated on the Drawings and to CW3330.
 - (d) Do not compact sand base prior to installing pavers.
- E25.4.5 Installation of Unit Pavers and Brick Pavers
- (a) Unit pavers and brick pavers shall be installed in formed concrete blockouts in accordance with the specification CW3335, set in locations and patterns as shown on the Drawings. Spaces between joints shall be uniform, consistent, shall not exceed 5mm, and shall maintain true patterns as indicated on the Drawings.
 - (b) Commence installation of pavers against edge to obtain straightest possible course for installation.
 - (c) Pavers shall be cut with saw only to obtain true even undamaged edges. Chipped pavers are unacceptable.
 - (d) Crews shall work on installed pavers, not on sand layer.
 - (e) Spread and fine grade joint sand over paving surface and sweep into joints.
 - (f) Sweep remaining sand over all paving areas and remove from site.
 - (g) Replace at no extra cost all whole or cut stones marked as unacceptable.
 - (h) Remove cracked, chipped, broken or otherwise damaged paving materials from Site immediately.
 - (i) Upon completion, clean in accordance with manufacturers recommendations.

E25.5 Quality Assurance

- E25.5.1 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 of 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.

E25.6 Measurement and Payment

The supply and installation of unit pavers and brick pavers shall be paid for on a square metre basis. Price shall be payment in full for supplying materials and for performing the Work.

E26. EXTERIOR METAL FABRICATION

E26.1 Description

- E26.1.1 Provide all labour, materials, methods, equipment and accessories for the fabrication and installation of galvanized tree grate frames.

E26.2 References

- E26.2.1 American Society for Testing and Materials International, (ASTM)
- (a) ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - (b) ASTM A269-02, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - (c) ASTM A307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- E26.2.2 Canadian Standards Association (CSA International).
- (a) CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.
 - (b) CAN/CSA-G164-M93(R1998), Hot Dip Galvanized or Irregularly Shaped Articles, or latest.
 - (c) CAN/CSA-S16.1-01, Limit States Design of Steel Structures.
 - (d) CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - (e) CSA W59-1989, R2001, Welded Steel Construction, Metal Arc Welding, Imperial Version.

E26.3 Materials

- E26.3.1 Tree Grate Frame
- (a) Frame: 112 x 76mm x 6mm thk. steel tube.
 - (b) Lip: 9mm thk. Steel flat bar.
 - (c) Free Standing Support:
 - (i) 112 x 112mm x 6mm thk. steel tube.
 - (ii) 6mm flat bar plate.
 - (d) All components to be hot-dip galvanized following assembly.
- E26.3.2 Accessories
- (a) Welding materials: to CSA W59.
 - (b) Welding electrodes: to CSA W48 Series.

E26.4 Submittals

- E26.4.1 Submit shop drawing for tree grate frame:
- (a) Shop drawing to clearly indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number and size of anchors, supports, reinforcement, details and accessories.
 - (b) Indicate and list hardware and miscellaneous items.
 - (c) Provide templates, patterns, fixing diagrams as required.
 - (d) Indicate related, adjacent materials, and connections.
- E26.4.2 Submit mock up of one tree grate with galvanized frame fully assembled for review and approval by Contract Administrator.

E26.5 Delivery, Storage and Handling

- E26.5.1 Deliver materials to site, suitably packaged. Do not deliver materials long before they are required on site. Cause no delays to scheduling.
- E26.5.2 Store materials in a dry location off the ground, and prevent damage.

E26.5.3 Materials that have been damaged or deemed unfit for use during delivery or storage shall be immediately replaced at no cost.

E26.6 Site Conditions

E26.6.1 Make a careful examination of the site and structures and investigate all matters relating to the nature of the work to be undertaken, the means of access and egress, the rights and interests which may be interfered with during the construction of the Work.

E26.6.2 Report any discrepancies or omissions to the Contract Administrator, who will issue written clarification. Oral interpretations or instructions are not acceptable.

E26.7 Construction Method

E26.7.1 Review and understand tree grate dimensions and details.

E26.7.2 Obtain approval of shop drawings and mock-up prior to fabrication.

E26.7.3 Have a tree grate on hand prior to fabrication. Tree grate shall sit flush with top of frame lip. Know thickness of hot-dipped galvanization material to ensure that tree grate is flush with top of lip following galvanization.

E26.7.4 Lip shall sit flush with adjacent surfaces. Adjust height of frame steel tube as required to make flush.

E26.7.5 Fabricate work square, true, straight and accurate to required sizes, with joints closely fitted and properly secured.

E26.7.6 Do welding work in accordance with CSA W59.

E26.7.7 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

E26.7.8 De-grease and be-bur all sharp edges in the shop left behind after fabrication is complete, prior to galvanization.

E26.7.9 Hot-dip galvanize after fabrication. No touch-up, welding, drilling or grinding will be accepted after galvanization.

E26.8 Installation

E26.8.1 Erect metal work square, plumb, straight and true, accurately fitted, with tight joints and intersections.

E26.8.2 Install tree grate frame on tree vault thickened edge. Remove debris from lip and/or grind down concrete as required to ensure tree grate frames do not wobble. Remove debris from lip and/or grind down concrete as required to ensure tree grate frame is flush with adjacent surfaces.

E26.9 Acceptance

E26.9.1 Work will be accepted only if it is erected true to the Drawings and conforms to the approved shop drawings and mock-up.

E26.10 Measurement and Payment

E26.10.1 The fabrication and installation of tree grate frames shall be paid for on a unit each basis. Price shall be payment in full for supplying materials and for performing the Work.

E27. SITE FURNISHINGS

E27.1 Description

E27.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and install of tree grates, bollards with plastic sleeves and bike racks.

E27.2 Submittals

E27.2.1 Submit product data for tree grates.

E27.2.2 Submit shop drawings for tree grates.

E27.2.3 Submit mock up of one tree grate with galvanized frame fully assembled for review and approval by Contract Administrator. Refer to Exterior Metal Fabrication specification.

E27.3 Materials

E27.3.1 Tree Grate

(a) 1219 x 1219mm Metropolitan tree grate model# R-8706-1A, excluding frame, grey iron finish. Available from Crozier Enterprises ph. 416-214-7727, or approved equal.

E27.3.2 Bollards With Plastic Sleeves

(a) Plastic Sleeve: 1320mm ht. plastic sleeve model # R-7173, colour black. Available from Reliance Foundry ph. 1-888-735-5680, or approved equal.

(b) Bollard: schedule 40 steel pipe, 150mm dia. min., size as recommended by manufacturer to suit plastic sleeve.

E27.3.3 Bike Rack

(a) Hoop style surface mounted bike racks, powdercoated black, to match hoop style bike racks in the Exchange District. Available from Rackworks ph. 204-955-5221, or approved equal.

(b) Anchor Bolts for Bike Racks on Concrete Sidewalk: 6mm dia. x 100mm stainless steel anchor bolts.

E27.4 Construction Methods

E27.4.1 All work is to be located and installed in accordance with the Drawings and manufacturers specifications.

E27.4.2 All furnishings to be installed plumb and true to correct elevations and location, as directed by the Contract Administrator. The Contractor shall confirm proposed locations of all site furnishings with Contract Administrator prior to installation.

E27.4.3 All furnishings to be carefully handled so that no parts will be bent, broken, or otherwise damaged. Contractor is responsible for replacing any damaged furnishings, prior to installation, at no cost to the City.

E27.4.4 Install tree grate in galvanized tree grate frame. Tree grate to sit flush with top of frame lip.

E27.5 Measurement and Payment

E27.5.1 The supply and installation of tree grates, bollards and bike racks shall be paid for on a unit each basis. Price shall be payment in full for supplying materials and for performing the Work.

E28. PLANTING MEDIUM & FINISHED GRADING

E28.1 Description

E28.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of planting medium in tree vaults.

E28.2 References

E28.2.1 Agriculture and Agri-Food Canada

.1 The Canadian System of Soil Classification, Third Edition, 1998.

E28.2.2 Canadian Council of Ministers of the Environment (CCME) Guidelines.

E28.2.3 The City of Winnipeg Standard Construction Specifications

- .1 CW 1130 – Site Requirements
- .2 CW 3540 – Topsoil and Finish Grading for Establishment of Turf Areas

E28.3 Submittals

E28.3.1 Submit 0.5kg sample of topsoil to National Testing Laboratory, or approved alternate, and indicate present use and intended use. Prepare and ship sample in accordance with Provincial regulations and testing laboratory requirements.

E28.3.2 Submit two (2) copies of soil analysis and recommendations for corrections to Contract Administrator.

E28.4 Quality Assurance

E28.4.1 Inform Contract Administrator of proposed source of materials to be supplied and provide a sample for review by Contract Administrator prior to installation.

E28.4.2 Testing of planting medium to be carried out and paid for by Contractor. Prepare and ship planting medium samples to approved laboratory in accordance with Provincial regulations and laboratory requirements, indicating intended use on each sample.

E28.4.3 Test planting medium for nutrients N, P, K, micronutrients, soluble salt content, pH value and OM (organic matter).

E28.4.4 Acceptance of planting medium is subject to an inspection of material and confirmation of test results. Do not commence soft landscaping work until Contract Administrator has accepted planting medium.

E28.5 Delivery, Storage and Handling

E28.5.1 Store materials in a dry area, protected from freezing, sedimentation and contamination.

E28.5.2 Deliver and store fertilizer in waterproof bags labeled with weight, analysis and name of manufacturer.

E28.6 Materials

E28.6.1 Planting Medium: In accordance with CW 3540 for topsoil except organic matter to be in the range of 5-10%.

E28.6.2 Peatmoss: deliver from partially decomposed fibrous or cellular stems and leaves of species of sphagnum mosses. Elastic and homogeneous, brown in colour. Free of wood and deleterious material that could prohibit growth. Shredded particle minimum size: 5 mm.

E28.6.3 Sand: hard fine silica sand, well washed and free of impurities, chemical or organic matter. Coarse texture, and to the following gradation:

<u>Particle Size (mm)</u>	<u>% Passing through Screen</u>
2.0	100%
1.0	95 to 100%
0.5	80 to 100%
0.25	0 to 30%
0.15	0 to 8%
0.075	0 to 1%

E28.6.4 Fertilizer: Synthetic start-up slow release fertilizer with a N-P-K analysis of 12-36-15 ratio at a rate of 4 kg per 100 m² which is 8 pounds per 100 sq ft.

E28.7 Construction Method

E28.7.1 Excavation

- (a) Excavate tree vaults by hand unless otherwise directed by Contract Administrator. Dispose of all rock, clay soils and other deleterious materials off Site.
- (b) Protect bottom of excavations against freezing.
- (c) Remove water that has entered the excavated tree pit prior to planting. Notify Contract Administrator if water source is groundwater.
- (d) Verify and obtain approval by Contract Administrator of tree vaults with geotextile prior to compacted soil mound and planting medium placement.

E28.7.2 Planting Medium Placement

- (a) Place planting medium in uniform layers over approved, unfrozen sub-grade, to the depth indicated on the Drawings.
- (b) Eliminate rough spots and low areas, Prepare a loose, friable bed, boot firm and level.

E28.7.3 Soil Amendments

- (a) Apply lime, sulphur, or other soil amendment at a rate determined and recommended from planting medium sample test.
- (b) Mix soil amendment well into full depth topsoil prior to application of fertilizer.

E28.7.4 Finished Grading

- (a) Per CW3540.
- (b) Fine grade entire soil area to elevations as indicated on the Drawings. Eliminate rough spots and low areas Leave surfaces smooth, uniform and firm against foot printing with a fine loose texture.

E28.8 Surplus Material

E28.8.1 Dispose of unused planting medium off Site in accordance with CW1130.

E28.9 Cleaning

E28.9.1 Perform cleaning to remove accumulated environmental dirt from all paved surfaces of building faces. Remove surplus materials, rubbish, tools and equipment barriers.

E28.10 Measurement and Payment

E28.10.1 Planting Medium shall be paid for a cubic metre basis. Price shall be payment in full for supplying materials and for performing the Work.

E29. EXTERIOR SITE CARPENTRY

E29.1 Description

E29.1.1 Provide labour, materials, methods, equipment and accessories for the fabrication and installation timber bench and stage at Public Monument to the 1919 Winnipeg General Strike.

E29.2 References

E29.2.1 American Society for Testing and Materials International, (ASTM)

- (a) ASTM Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- (b) ASTM A588 Specification for weathering steel bars.

E29.2.2 Canadian Standards Association (CSA International)

- (a) CSA B111, Wire Nails, Spikes and Staples
- (b) CSA O141 Softwood Lumber
- (c) CSA O80, Wood Preservation

- (d) CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel
- (e) CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles

E29.3 Materials

E29.3.1 White Oak Lumber

- (a) white oak, kiln dried and sanded sides faces and edges from a local source.

E29.3.2 Hardware

- (a) Nails and spikes: to CAS B111, galvanized, for exterior works and for treated lumber. Use spiral thread nails.
- (b) Threaded rods, bolts nuts, washers, lag screws to be hot dipped galvanized, sizes to suit application.
- (c) Lag screws: hot dipped, galvanized, sizes to suit application.
- (d) Joist Hangers: galvanized steel.
- (e) Handrails on bench, and plates with threaded rods to accept timbers; ¼" x 2" weathering steel bar.

E29.4 Submittals

E29.4.1 Submit product data and samples for:

- (a) Sample of white oak.

E29.5 Quality Assurance

E29.5.1 Carpentry shall be performed by trained and qualified craftspeople with demonstrable experience sourcing and work.

E29.5.2 Conduct a pre-installation meeting with the Contract Administrator to verify requirements.

E29.5.3 Lumber Identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

E29.5.4 For products treated with preservative by pressure impregnation, submit following information certified by authorized signing officer of treatment plant:

- (a) Information listed in AWWA.M2 and revisions specified in CAN/CSA-080 Series, Supplementary Requirement to AWWA Standard M2 applicable to specified treatment.
- (b) Moisture content after drying following treatment with water-borne preservative.

E29.5.5 All wood to be free of defects. Any warped, checked or bent materials will be rejected.

E29.6 Construction Method

E29.6.1 Handle and use treated and non-treated wood in a manner which will avoid damage or field fabrication causing alteration in original treatment.

E29.6.2 Construct all work as indicated on the Drawings using adequate fastening methods to ensure solid durable finished work suitable for the purpose intended.

E29.6.3 Do all nailing and fastening neatly, evenly and thoroughly.

E29.6.4 Frame anchor, fasten, tie and brace members to provide necessary strength and rigidity. Install all members true to line, levels and elevations.

E29.6.5 Set plumb and space uniformly. Countersink bolts where necessary to provide clearance for other work.

E29.7 Measurement and Payment

E29.7.1 The supply and installation of Wood Bench (including seat, bench arm, and bench back) and Platform shall be paid as a lump sum. Price shall be payment in full for supplying materials and for performing the Work.

E30. TREE PLANTING

E30.1 Description

E30.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of trees.

E30.2 References

E30.2.1 Agriculture and and Agri-Food Canada (AAFC)

(a) Plant Hardiness Zones in Canada-2000.

E30.2.2 Canadian Nursery Landscape Association (CNLA)

(a) Plant Canadian Standards for Nursery Stock-2001.

E30.2.3 Department of Justice Canada (JUS)

(a) Plant Canadian Environmental Protection Act (CEPA), 1999, c. 33.

(b) Transport of Dangerous Goods Act (TDGA), 1992, c.34.

E30.2.4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)

(a) Materials Safety Data Sheets (MSDS).

E30.3 Submittals

E30.3.1 Submit product data for:

(a) Fertilizer.

E30.4 Source Quality Control

E30.4.1 Obtain approval from Contract Administrator of plant material at source.

E30.4.2 Notify Contract Administrator of source of material at least seven (7) days in advance of shipment. No work under this Section is to proceed without approval.

E30.4.3 Acceptance of plant material at source does not prevent rejection on Site prior to or after planting operations.

E30.4.4 Plant material imported from other nations will not be accepted.

E30.4.5 Bare root plant material will not be accepted.

E30.5 Storage and Protection

E30.5.1 Coordinate the shipping of plants and excavation of tree vaults to ensure minimum time laps between digging and planting.

E30.5.2 Protect plant material from frost, excessive heat, wind and sun during delivery.

E30.5.3 Protect plant material from damage during transportation:

(a) When delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.

(b) When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.

(c) Protect foliage and rootballs using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.

E30.5.4 Protect stored plant material from frost, wind and sun as follows:

- (a) For balled and burlapped and wire basket rootballs, place to protect branches from damage. Maintain moisture level in root zones.

E30.5.5 Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 20mm (3/4") diameter with wound dressing.

E30.5.6 Keep roots moist and protect from sun and wind. Heel-in trees that cannot be planted immediately in shaded areas and water well.

E30.6 Scheduling

E30.6.1 Order plant material as soon as possible after award of contract to ensure plant availability. Request substitutes as required.

E30.6.2 Provide Contract Administrator a written schedule fourteen (14) days in advance of shipment of plant material. Schedule to include: quantity and type of plant material, shipping dates, arrival dates on Site, and planting dates.

E30.7 Warranty of Nursery Stock

E30.7.1 For all plant material a two (2) year warranty period is required.

E30.7.2 During the warranty period, upon written notification from the Contract Administrator, the Contractor warrants to replace and replant any nursery stock found dead and/or in poor condition as soon as possible thereafter, without cost to The City. "Poor Condition" shall be interpreted as meaning nursery stock on which branches are dead or dying, or have not shown satisfactory growth in leaves. Exempted is nursery stock damaged by accidental causes or vandalism, which stock shall be replaced at the cost of The City.

E30.7.3 At the end of the two (2) year warranty period an inspection will be conducted by Contract Administrator.

E30.7.4 Contract Administrator reserves the right to extend Contractor's warranty responsibilities for an additional one (1) year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

E30.8 Replacements

E30.8.1 During warranty period, remove and replace any plant material that has died or failed to grow satisfactorily, at no cost to the owner, as directed by the Contract Administrator.

E30.8.2 A two (2) year warranty period shall be required on all replacement plant material.

E30.8.3 All replacement plant material shall be the same size and species as specified, and shall be supplied and planted in accordance with the original Drawings and Specifications.

E30.8.4 Should the replaced plant material not survive, the Contractor will be responsible for a third replacement and a two (2) year warranty period shall be required.

E30.8.5 Type of root preparation, sizing, grading and quality shall comply to the Canadian Standards for Nursery Stock.

E30.8.6 Source of plant material: grown in Zone 3 only in accordance with Plant Hardiness Zones in Canada. Plant material must be planted in zone indicated as appropriate for its species.

E30.8.7 Plant material free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

E30.8.8 Substitutions to plant material as indicated on planting plan are not permitted unless written approval has been obtained as to type, variety and size. Plant substitutions must be of similar species and of equal size as those originally specified.

E30.8.9 Refer to Plant Specification List on the Drawings and the Drawings for species, quantities, size and quality of plant materials.

E30.9 Water

- E30.9.1 Water free of impurities that would hinder plant growth. The Contractor shall provide water, so that all costs to provide water for the watering operation and all associated costs shall be borne by the Contractor. These costs may include hydrant permit and meter rental fees.
- E30.9.2 Further to clause 3.7 of CW 1120, the Contractor shall pay for all costs associated with obtaining water in accordance with the Waterworks By-law. Sewer charges will not be assessed for water obtained from a hydrant.
- E30.10 Planting Medium: backfill with planting medium as specified in Planting Medium Specification.
- E30.11 Fertilizer: synthetic start-up slow release fertilizer with a N-P-K analysis of 12-36-15 ratio at a rate of 4 kg per 100 m² which is 8 pounds per 100 sq ft.
- E30.12 Pre-Planting Preparation
- E30.12.1 Obtain approval from Contract Administrator of finish grading, and planting medium installation prior to commencing Work in this section.
- E30.12.2 Ensure plant material is acceptable to the Contract Administrator.
- E30.12.3 Remove damaged roots and branches from plant material with sharp clean equipment treating wounds as necessary to maintain plant health.
- E30.12.4 Apply anti-desiccant to deciduous trees in leaf in accordance with manufacturer's instructions.
- E30.13 Plant Material Layout
- E30.13.1 Prepare planting beds. Refer to Planting Medium Specification.
- E30.13.2 For individual trees:
- (a) Stake out locations of all trees and obtain approval from Consultant prior to excavating tree pits.
 - (b) Excavate tree pits to depths and widths indicated on the Drawings.
Remove rocks, roots, debris and toxic material from the tree pit.
- E30.13.3 Remove water that has entered the excavated tree pit prior to planting. Notify Contract Administrator if water source is groundwater.
- E30.14 Planting
- E30.14.1 For jute burlap rootballs, cut away top one third of wrapping and wire basket without damaging rootball. Do not pull burlap or rope from under rootball.
- E30.14.2 For container stock or rootballs in non-degradable wrapping, remove entire container or wrapping without damaging rootball. Loosen rootball to encourage bonding with planting medium and subgrade.
- E30.14.3 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.
- E30.14.4 For trees:
- (a) Backfill soil in 150 mm (6") lifts. Tamp each lift to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade.
 - (b) Form watering saucer as indicated on the Drawings.
- E30.14.5 Water plant material thoroughly. Report extreme ponding in planters indicative of malfunctioning drains to the Contract Administrator immediately.
- E30.14.6 After soil settlement has occurred, fill with soil to finish grade.
- E30.14.7 Dispose of burlap, wire and container material off Site.

E30.15 Pruning

E30.15.1 Undertake corrective pruning after planting to eliminate torn and broken branches. Do not damage lead branches or remove smaller twigs along main branches. Do not prune to compensate for root loss.

E30.16 Maintenance

E30.17 Maintain plant material from date of planting to the end of the warranty period. Refer to Landscape Maintenance Specification.

E30.18 Measurement and Payment

E30.18.1 Trees shall be paid for on a unit each basis. Price shall be payment in full for supplying materials and for performing the Work.

E31. LANDSCAPE MAINTENANCE

E31.1 Description

E31.1.1 Provide all labour, materials, methods, equipment and accessories for the maintenance of trees in tree vaults following the installation of trees and the acceptance of trees to start the maintenance and warranty period.

E31.1.2 In general, the Work shall include:

- (a) Fertilizing
- (b) Watering
- (c) Weed Control
- (d) Pest and disease Control
- (e) Winter Preparation

E31.1.3 Maintenance shall be performed on an as required basis.

E31.2 Maintenance and Warranty Period

E31.2.1 Thirty (30) days after tree installation, the Contract Administrator shall perform an inspection of the trees to determine if the plant material is acceptable to start maintenance and warranty period.

E31.2.2 The maintenance and warranty period shall begin following acceptance of trees by Contract Administrator and shall be for a period of two (2) years.

E31.3 Materials and Equipment

E31.3.1 Materials shall conform to the requirements of related Specification sections.

E31.3.2 Provide all equipment to properly execute Work. Maintain such equipment in a workable, safe condition while in use during this project.

E31.3.3 Contract Administrator shall review equipment to be used to execute Work prior to execution.

E31.4 Method

E31.4.1 General

- (a) Provide watering service within 24 hours, weeding services within 48 hours of the request by the Contract Administrator. Monitor the Site and advise the Contract Administrator of conditions that might void the Contractor's warranty responsibilities.
- (b) The Contractor shall maintain a log noting times, dates, equipment used, and quantity of materials used and areas treated for each maintenance application. Forms shall be provided by Contract Administrator. Submit log to Contract Administrator upon

request. Contractor shall notify Contract Administrator of the exact time Contractor proposes to commence each application.

- (c) Schedule operations in accordance with growth, health, weather conditions, and use of Site.
- (d) Perform each operation continuously and completely within a reasonable time period.
- (e) Store equipment and materials off Site.
- (f) Collect and dispose of debris or excess material on the day the maintenance is undertaken.

E31.4.2 Maintenance of Trees:

- (a) Fertilizing: Apply fertilizer only at frequency, ratio and rates as recommended by manufacturer. Water immediately after fertilizing. Apply fertilizer no later than May 30th of each maintenance year.
- (b) Watering: Apply water as required to supplement rainfall and to maintain optimum growing conditions. In general, water once a week to achieve rates as indicated. Allow soil to adequately dry between watering to prevent over saturation without creating water stress. Subject to the above-noted requirements, the Contractor must water at least once a week between May 1st and October 15th inclusive. A complete record is to be kept of each series of waterings for all planted trees noting location and date of watering. This record is to be given to the Contract Administrator when requested. Apply 40 litres of water per 25 mm calliper per application using a deep root feeder or low pressure open flow nozzle and hose. The water stream must not gouge the soil and mulch.
- (c) Weed Control: Inspect and undertake weed control weekly during the first year of maintenance and monthly during the second year. By hand, remove all weeds with their roots from tree pits and tree beds and dispose of off Site. When weeding operation is complete, replace and rake displaced mulch to its original condition.
- (d) Pests and Diseases: Obtain written approval of Contract Administrator prior to using any pesticide. Control pests and disease through pruning or application of pesticides. Use species specific pesticides where possible. Use only pesticides of low mammalian toxicity. Strictly follow manufacturer's written instructions.
- (e) Pruning: The Contractor shall provide a person with a Manitoba Arborists Certificate for each work crew or Work Site. Prune as required to remove dead, broken or damaged limbs. Prune back to healthy growth while maintaining balanced crown shape. Employ clean sharp tools. Make cuts smooth and flush with outer edge of branch collar near the main stem or branch. Cuts must be smooth and sloping to prevent accumulation of water on cut. Do not leave little stumps ("horns") on trunks or main branches. Prune according to accepted horticultural practices as outline in "The Pruning Manual", Publication No. 1505-1977 by Agriculture Canada.
- (f) Winter Preparation: Ensure adequate moisture in tree root zones prior to freeze-up.

E31.5 Measurement and Payment

E31.5.1 Landscape maintenance shall be paid for on a lump sum basis for the items of work listed below. Price shall be payment in full for supplying all material and performing all operations herein described and all other items incidental to the Work included in this Specification.

Items of Work:

- (i) Landscape Maintenance Year 1
- (ii) Landscape Maintenance Year 2

E32. PLACEMENT OF UTILITY CONDUITS

E32.1 Description

- E32.1.1 This specification will cover the placement of utility supplied conduits as identified on the drawings.
- E32.2 Materials
- E32.2.1 Conduit shall be supplied by the identified utilities.
- E32.2.2 The Contractor shall contact the utility companies to obtain the conduits.
- E32.3 Construction Methods
- E32.3.1 Construct all work as shown on the Drawings or as directed by the Contract Administrator.
- E32.3.2 Minor deviations from Standard Details may be required in the field where unknown underground obstructions are encountered. The Contractor shall not deviate from the Drawings or standard details without prior approval by the Contract Administrator.
- E32.4 Backfill General
- E32.4.1 Place sand backfill as the bottom layer of all trenched excavations. Sand is placed to a depth of 200 millimetres over the full width of the area of excavation. Install plastic conduit so it is vertically and horizontally centred in the sand backfill.
- E32.4.2 Place the sand bottom layer of backfill so that the in situ ground in the excavated area is covered and the conduit is protected from ridges, bumps or other features that may cause damage to the conduit.
- E32.4.3 Place conduit in accordance with Section 3.11 of this specification.
- E32.4.4 Place sand backfill on top of conduit in such a manner that the conduit is not bent or kinked.
- E32.4.5 Tamp sand firmly from the sides of the conduit, down and under the conduit.
- E32.5 Installation of Conduit
- E32.5.1 Install conduit of either a single length of 38 mm or 52 mm plastic conduit, or use multiple lengths of 38 mm or 52 mm plastic conduit placed side by side in accordance with the Drawings.
- E32.5.2 Install conduit at a preferred depth of one metre (1 m) below street level. The preferred one metre (1m) depth may be increased for the purpose of avoiding underground obstructions or decreased to minimum of 900mm as directed by the Contract Administrator.
- E32.5.3 Install conduits so that in no cases shall the conduit be formed into a bend radius of less than 500 millimetres.
- E32.5.4 Install conduit either by directional boring or open trenching, subject to the following conditions:
- (a) Open cut to facilitate pushing operations only at termination locations and cutovers, where required by outside utilities, or as directed by the Contract Administrator.
 - (b) Install conduit along landscaped boulevards by directional boring, unless otherwise directed by the Contract Administrator.
- E32.5.5 Open trench as directed by the Contract Administrator. The width of the trench shall be 200mm maximum, or in accordance with the drawings.
- E32.5.6 Terminate all conduit installations in accordance with the Drawings. Types of terminations are as follows:
- (a) Joining onto an existing conduit.
 - (b) Entry into a base or service box to be constructed under this Specification.
 - (c) Above ground level affixed to a wood pole or structure.
 - (d) Below ground level for a stub.

- (e) Through a drill hole into pavement to be used as a lead-in conduit for vehicle detector loops.

E32.5.7 When the conduit is terminated above ground level on a wood pole or structure the conduit shall have a true vertical position below the termination point starting at ground level immediately adjacent to the designated pole or structure. The conduit projection left above ground shall have a length of at least 450 mm.

E32.5.8 Immediately following installation, fit plastic conduit plugs snugly into the open ends of conduit terminated above and below ground, except for lead-in conduit for vehicle detector loops as noted in SD-332. Install plastic conduit plugs prior to placing any concrete for signal bases or service boxes, and before backfilling over conduit stubs. Leave plastic conduit plugs in place except for temporarily removal required for the installation of twine.

E32.6 Measurement and Payment

E32.6.1 Installation of Conduit

- (a) Installation of Conduit shall be measured on a length basis and paid for at the Contract Unit price per metre for "Items of Work". The length to be paid for shall be the total number of metres of trench for conduit placement, including conduit stubs installed in accordance with this specification, accepted and measured by the Contract Administrator.

E32.6.2 Items of Work:

- (i) Placement of Utility Conduits

E32.6.3 The length of conduit installed shall be measured horizontally between the centre points of the specified terminal points of the conduit. Installed conduit shall be measured along the path of installation.

E32.6.4 No measurement or payment shall be made for Joining of Conduit.

E32.6.5 No measurement or payment shall be made for the removal of blockages or water from the conduit unless the Contract Administrator determines that the cause of the blockage or water was not caused by the Contractor.

E32.6.6 No measurement or payment shall be made for Manitoba Hydro safety watches or MTS/Shaw supervision.

E32.6.7 No measurement or payment shall be made for the repair of conduit that is damaged by the Contractor and cannot accept wiring. This includes work and materials to remove pavement, excavate, and restoration of the cut.

E33. HYDRO-EXCAVATION

Description

E33.1 This specification shall cover the removal of earthen material immediately adjacent to underground utilities infrastructure by means of high pressure water spray, and the recovery of excavated material by vacuum type means or equivalent method as approved by the Contract Administrator.

Equipment

E33.2 Hydro-Excavation equipment shall be capable of maintaining a minimum working pressure of 10,000 psi, at a rate of flow of 10 to 12 gallons per minute. The unit should be adjustable, so as to provide adequate pressure to remove earthen material identified by the Contract Administrator.

E33.3 Spray head shall be equipped with a rotating type nozzle in order to provide a wider path of cut.

Construction Methods

E33.4 Hydro-Removal of Earthen Material

E33.4.1 Earthen material adjacent to utility entity shall be sprayed with high pressure water so as to remove all such material identified by the Contract Administrator.

E33.5 Recovery of Excavated Material

E33.5.1 The recovery of excavated material shall be done using a vacuum type method, or other type method as approved by the Contract Administrator.

E33.5.2 The recovery of material shall follow immediately behind the excavation, to avoid excavated areas from filling with excavated material.

E33.5.3 The use of mechanical sweepers will not be allowed.

E33.5.4 Dispose of material in accordance with Section 3.4 of CW 1130-R2.

E33.6 Measurement and Payment

E33.6.1 Hydro-Excavation will not be measured and shall be included in the unit price for "Cast-In-Place Concrete Piles" and "CIP Reinforced Concrete Pile for Pedestrian Light"

E34. SOFT EXCAVATION TO EXPOSE UNDERGROUND UTILITIES

E34.1 Description

E34.1.1 This specification covers the soft excavation to expose underground utilities to determine the depth of the underground utility and whether it will interfere with the installation of proposed Works on site.

E34.1.2 These underground utilities include, but are not limited to, Manitoba Hydro cables, MTS cables, CPR, existing sewers, and existing watermains.

E34.2 Materials

E34.2.1 Backfill Material

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

E34.3 Construction Methods

E34.3.1 Prior to commencement of any construction works adjacent to underground utilities, the Contractor shall use soft digging or hand excavation to expose the underground utilities.

E34.3.2 Once the elevation of the top of the pipe or duct has been determined the resulting excavation shall be backfilled with bedding sand to the elevation of the existing ground.

E34.4 Measurement and Payment

E34.4.1 Soft excavation to expose underground utilities will be considered incidental to the Work. No measurement and payment will be made within this section.

E35. WORKING IN CLOSE PROXIMITY TO THE AQUEDUCT

E35.1 Prior to any construction, the Aqueduct must be exposed by soft dig method so as to confirm depth and location.

E35.2 Granular material, construction material, soil or other material shall not be stockpiled on the Aqueduct or within 5 meters of centreline of the Aqueduct.

E35.3 Stage construction such that the Aqueduct is not subjected to significant asymmetrical loading at any time.

E35.4 Where work is in close proximity to the Aqueduct, utilize construction practices and procedures that do not impart excessive vibration loads on the Aqueduct or that would cause the settlement of the subgrade below the Aqueduct.

E35.5 Concrete pavement removal and excavation within 3 metres horizontally of the Aqueduct shall be completed by saw cutting and removal, or use of hand held jack hammers. Use of machine mounted concrete breakers above the Aqueduct shall not be permitted.

E36. CAST-IN-PLACE CONCRETE

E36.1 Description

- (a) The Work covered under this Item shall include all concreting operations related to construction of cast-in-place concrete 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.

E36.2 Materials

E36.2.1 General

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

E36.2.2 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 A23.1-14.

E36.2.3 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.

E36.2.4 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.

E36.2.5 Cement

- (a) Cement shall be Type HS or HSb, high-sulphate-resistant hydraulic cement, conforming to the requirements of CSA Standard A23.1-14.

E36.2.6 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 @ 28 days = 32 MPa
 - (iii) Water / Cementing Materials Ratio = 0.45
 - (iv) Air Content: Category 2 per Table 4 of CSA A23.1-04 (4-7%)
 - (v) Cement – shall be as specified in E14.2.5.
- (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.

E36.2.7

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.

E36.2.8 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.

E36.2.9 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.

E36.2.10 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.

E36.2.11 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 90 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.

E36.2.12 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. Reinforcing steel supply and installation will be incidental to construction of concrete foundation and no separate payment will be made.

E36.2.13 Miscellaneous Materials

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

E36.3 Construction Methods

E36.3.1 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.

E36.3.2 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.

E36.3.3 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.

E36.3.4 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.

E36.3.5 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.

E36.3.6 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.

E36.3.7 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.
- (o) For piles foundation, the top of the piles shall be formed with tubular forms (Sonotube) to the depth shown on the Drawings.

E36.3.8 Placing Concrete

- (a) 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 100 mm. The concrete shall be vibrated throughout the entire length.
- (b) Concrete shall be placed to the elevations as shown on the Drawings. The top surface of the pile/bench shall be finished smooth and even with a hand float.
- (c) 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.

E36.3.9 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.

E36.3.10 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 10°C 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 3° in one hour or 20° in twenty-four hours.

E36.3.11 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.

E36.3.12 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 wellbrushed 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.

E36.3.13 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 10°C for a minimum of

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

E36.3.14 Anti-Graffiti Coating

- (a) Anti-graffiti coating shall be applied to all planter walls and grade beams supporting wooden bench and stage at Public Monument to the 1919 Winnipeg General Strike 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.

E36.3.15 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.

E36.3.16 Drilling Anchor Rods

- (a) The anchor rods shall be aligned with a steel template to match the steel plates/angels holes as per Drawings. Extreme care shall be used in this operation to ensure rods are aligned properly and avoid direct contact with internal reinforcing steel.
- (b) Size and embedment of the anchor rods shall be as per Drawings.
- (c) Anchor rods doweling shall be performed using SIKA AnchorFix-3 / SIKA AnchorFix-4 epoxy adhesive or equivalent product. Installation of the anchor rods shall be done in accordance with manufacturer's instructions or recommendation.

E36.3.17 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.

E36.4 Measurement and Payment

E36.4.1 Supply and Installation of CIP Reinforced Concrete Pile for Pedestrian Light will be measured on a unit basis and paid for at the Contract Unit Price for "CIP Reinforced Concrete Pile for Pedestrian Light". The quantity to be paid for shall be the total number of units supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator.

E36.4.2 Supply and Installation of CIP Reinforced Concrete Bench will be measured on a lump sum basis and paid for at the Contract Unit Price for "CIP Reinforced Concrete Bench". The quantity to be paid for each unit of supplied and placed in accordance with this Specification and accepted by the Contract Administrator.

E36.4.3 Construction of Cast-in-Place Concrete

- (a) Construction of cast-in-place concrete will be measured on a unit basis for CIP Reinforced Concrete Pile for Pedestrian Light,

E37. MISCELLANEOUS ASPHALT REMOVAL

- E37.1 Remove existing asphalt, at locations as shown on the Drawings or as directed by the Contract Administrator. Remove all asphalt to a combined thickness of 100 millimetres, unless otherwise indicated in the Specifications.
- E37.2 Saw-cut the existing pavement full-depth along the limits designated for removal.
- E37.3 Utilize backhoe type equipment unless approved otherwise by the Contract Administrator.
- E37.4 Dispose of material in accordance with Section 3.4 of CW 1130.
- E37.5 Measurement and Payment
- E37.5.1 Pavement removal will be measured on an area basis and paid for at the Contract Unit Price per square meter for the "Miscellaneous Asphalt Removal". The area to be paid for will be the total number of square metres of existing pavement removed in accordance with this specification, accepted and measured by the Contract Administrator.

E38. FULL DEPTH SAW-CUTTING

- E38.1 Complete full depth saw-cuts at the depth of the existing concrete pavement at locations as directed by the Contract Administrator.
- E38.2 Measurement and Payment
- E38.2.1 Full depth saw-cutting will be measured on a length basis and paid for at the Contract Unit Price per metre for "Full Depth Saw-Cutting". The length to be paid for will be the total number of metres of existing concrete pavement saw-cut in accordance with this specification, accepted and measured by the Contract Administrator.

E39. PROVISIONAL ITEMS

- E39.1 The Provisional Items listed in the Schedule of Prices are a part of the Contract.
- E39.2 The Contractor shall not perform Work included in the Provisional Items without prior authorization from the Contract Administrator. All Work included in the Provisional Items will be carried out within the construction areas shown on the Drawings.
- E39.3 Notwithstanding GC:7, the City reserves the right to diminish all or any portion of the Items of Work listed in the Provisional Items and no claim shall be made for damages on grounds of loss of anticipated profit or for any other reason.