



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 742-2014**

**NORTH EAST EXCHANGE DISTRICT 2014 STREET RENEWALS**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 North East Exchange District 2014 Street Renewals

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, August 21, 2014.

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

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

### **B3. ENQUIRIES**

B3.1 All enquiries shall be directed to the Contract Administrator identified in D4.1.

B3.2 If the Bidder finds errors, discrepancies or omissions in the Bid Opportunity, or is unsure of the meaning or intent of any provision therein, the Bidder shall notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least five (5) Business Days prior to the Submission Deadline.

B3.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator to all Bidders by issuing an addendum.

B3.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator only to the Bidder who made the enquiry.

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

### **B4. CONFIDENTIALITY**

B4.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

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

B4.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Bid Opportunity to the media or any member of the public without the prior written authorization of the Contract Administrator.

### **B5. ADDENDA**

B5.1 The Contract Administrator may, at any time prior to the Submission deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.

B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.

B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>

B5.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

## **B6. SUBSTITUTES**

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

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

B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.

B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:

- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
- (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
- (c) identify any anticipated cost or time savings that may be associated with the substitute;
- (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
- (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.

B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an "approved equal" or as an "approved alternative", or may refuse to grant approval of the substitute.

B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.

B6.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.

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

- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B15.
- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.
- B6.10 Notwithstanding B6.2 to B6.9, in accordance with B7.6, deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B15.1(a).

## **B7. BID COMPONENTS**

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
  - (b) Form B: Prices, hard copy;
  - (c) Bid Security
    - (i) Form G1: Bid Bond and Agreement to Bond, or  
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or  
a certified cheque or draft;
- B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.
- B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B7.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B7.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.
- B7.4.2 A hard copy of Form B: Prices must be submitted with the Bid. If there is any discrepancy between the Adobe PDF version of Form B: Prices and the Microsoft Excel version of Form B: Prices, the PDF version shall take precedence.
- B7.5 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.
- B7.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B15.1(a).
- B7.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B7.8 Bids shall be submitted to:
- The City of Winnipeg  
Corporate Finance Department  
Materials Management Division  
185 King Street, Main Floor  
Winnipeg MB R3B 1J1

## **B8. BID**

- B8.1 The Bidder shall complete Form A: Bid, making all required entries.
- B8.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
  - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
  - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
  - (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.
- B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B8.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:
- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
  - (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
  - (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, shall be affixed;
  - (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.
- B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

## **B9. PRICES**

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.1.1 Notwithstanding C12.2.3(c), prices on Form B: Prices shall not include the Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.
- B9.1.2 For the convenience of Bidders, and pursuant to B7.4.2 and B15.4.2, an electronic spreadsheet Form B: Prices in Microsoft Excel (.xls) format is available along with the Adobe PDF documents for this Bid Opportunity on the Bid Opportunities page at the Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

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

B9.5 Form B: Prices is organized into Parts: Part 1 of the Work and Part 2 of the Work. Bidders shall provide a total price for each Part and, on the summary sheet, a Total Bid Price consisting of the sum of prices for Part 1 and Part 2.

## **B10. QUALIFICATION**

B10.1 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.

B10.2 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>

B10.3 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);

B10.4 Further to B10.3(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/>).

B10.5 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.



- B10.6 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.

## **B11. BID SECURITY**

- B11.1 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.
- B11.1.1 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.
- B11.1.2 All signatures on bid securities shall be original.
- B11.1.3 The Bidder shall sign the Bid Bond.
- B11.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.
- B11.2 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.
- B11.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B11.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.
- B11.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.
- B11.3 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.

## **B12. OPENING OF BIDS AND RELEASE OF INFORMATION**

- B12.1 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.
- B12.1.1 Bidders or their representatives may attend.
- B12.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B11 will not be read out.
- B12.2 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/>

- B12.3 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/>
- B12.4 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.

### **B13. IRREVOCABLE BID**

- B13.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.
- B13.2 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.

### **B14. WITHDRAWAL OF BIDS**

- B14.1 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.
- B14.1.1 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.
- B14.1.2 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.
- B14.1.3 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 B14.1.3(b), declare the Bid withdrawn.
- B14.2 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 B13.2 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.

### **B15. EVALUATION OF BIDS**

- B15.1 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 B10 (pass/fail);
  - (c) Total Bid Price;

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

B15.2 Further to B15.1(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.

B15.3 Further to B15.1(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.

B15.4 Further to B15.1(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.

B15.4.1 Further to B15.1(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.

B15.4.2 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.

## **B16. AWARD OF CONTRACT**

B16.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B16.2 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.

B16.2.1 Without limiting the generality of B16.2, 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.

B16.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B15.

B16.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

## PART C - GENERAL CONDITIONS

### C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Construction* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at [http://www.winnipeg.ca/matmgt/gen\\_cond.stm](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 Reconstruction
  - (i) Market Avenue from Rorie Street to Bertha Street
  - (ii) Elgin Avenue from Lily Street to Bertha Street
  - (iii) Bertha Walkway Corridor from Market Avenue to John Hirsch Place
  - (iv) John Hirsch Place Walkway Corridor from Bertha Walkway Corridor to Bannatyne Avenue
  - (v) John Hirsch Place Walkway Corridor & Bertha Walkway Corridor Seating Node
- (b) Streetscaping
  - (i) Market Avenue from Rorie Street to Bertha Street
  - (ii) Elgin Avenue from Lily Street to Bertha Street
  - (iii) Bertha Walkway Corridor from Market Avenue to John Hirsch Place
  - (iv) John Hirsch Place Walkway Corridor from Bertha Walkway Corridor to Bannatyne Avenue
  - (v) John Hirsch Place Walkway Corridor & Bertha Walkway Corridor Seating Node

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

- (a) Pavement Reconstruction
  - (i) Concrete pavement removal;
  - (ii) Asphalt pavement removal;
  - (iii) Sidewalk removal;
  - (iv) Salvaging existing paving stones;
  - (v) Removal of existing paving stones;
  - (vi) Planing of asphalt pavement;
  - (vii) Excavation;
  - (viii) Installation of subdrains;
  - (ix) Installation of utility ducts;
  - (x) Compaction of existing sub-grade;
  - (xi) Installation of catch basins and connection pipe;
  - (xii) Plugging of existing sewers and sewer services smaller than 300 mm;
  - (xiii) Placement of separation geotextile fabric;
  - (xiv) Placement of sub-base and base course materials;
  - (xv) Construction of 200 mm concrete pavement partial slab patches;
  - (xvi) Construction of 200 mm concrete pavement (reinforced);
  - (xvii) Adjustment of existing manholes and catch basins;
  - (xviii) Adjustment of valve boxes;
  - (xix) Supply and installation of valve box extensions;
  - (xx) Concrete curb renewal;

- (xxi) Construction of 180 mm barrier curb;
- (xxii) Construction of 180 mm barrier curb and gutter using slip form paving methods;
- (xxiii) Construction of 180 mm modified barrier curb and gutter using slip form paving methods;
- (xxiv) Installation of 100mm sidewalk;
- (xxv) Installation of paving stones; and
- (xxvi) Joint sealing.

(b) Streetscaping

- (i) Excavations and removals;
- (ii) Concrete works;
- (iii) Paving works;
- (iv) Tree wells and covers;
- (v) Trellis installation
- (vi) Site furniture;
- (vii) Electrical work; and
- (viii) Plant material.

**D4. CONTRACT ADMINISTRATOR**

D4.1 The Contract Administrator is MMM Group Limited, represented by:

Vilko Maroti, CET, P.Eng.  
Manager (Transportation Engineering)

Telephone No. 204 943-3178  
Facsimile No. 204 943-4948

D4.2 At the pre-construction meeting, Vilko Maroti 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 B7.8

**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

## **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.

D12.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D12.2 If the bid security provided in his/her Bid was not a certified cheque or draft pursuant to B11.1(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 (Form L: Detailed Work Schedule) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.
- D14.2 The detailed work schedule shall consist of the following:
- (a) a Gantt chart for the Work; and
  - all acceptable to the Contract Administrator.
- D14.3 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 September 4, 2014
- D15.4.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

### **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 – Manhole Adjustments. The Contractor is expected to cooperate with Manitoba Hydro to facilitate construction;
- (b) Shaw Cable. The Contractor is expected to cooperate with Shaw Cable to facilitate construction;
- (c) MTS. The Contractor is expected to cooperate with MTS to facilitate construction;
- (d) Winnipeg Transit. The Contractor is expected to cooperate with Winnipeg Transit to facilitate construction;
- (e) Bertha Watermain Construction by Others. The Contractor is expected to cooperate with the Contractor of the watermain renewal to facilitate construction.

**D18. SEQUENCE OF WORK**

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

- D18.1.1 Construction activity is to be limited to one lane of the roadway at a time. No construction shall commence on the subsequent lane until all work is completed on the lane under construction, or as otherwise approved .
- D18.1.2 Construction activity on Market Avenue and Elgin Avenue are not permitted to occur at the same time in order to provide access to local residents and businesses.

**D19. SUBSTANTIAL PERFORMANCE**

- D19.1 The Contractor shall achieve Substantial Performance by October 31, 2014.
- D19.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D19.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

**D20. TOTAL PERFORMANCE**

- D20.1 The Contractor shall achieve Total Performance by November 7, 2014.
- D20.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D20.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

## **D21. LIQUIDATED DAMAGES**

- D21.1 If the Contractor fails to achieve Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Calendar Day for each and every Calendar Day following the days fixed herein for same during which such failure continues:
- (a) Substantial Performance – Three Thousand dollars (\$3,000.00);
  - (b) Total Performance – One Thousand Five Hundred dollars (\$1,500).
- D21.2 The amounts specified for liquidated damages in D21.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve critical stages, Substantial Performance or Total Performance by the days fixed herein for same.
- D21.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

## **D22. SCHEDULED MAINTENANCE**

- D22.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:
- (a) Reflective Crack Maintenance as specified in CW 3250 – Joint and Crack Maintenance of the City of Winnipeg Standard Construction Specifications.
  - (b) Landscape Maintenance as specified in E29;
- D22.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

## **CONTROL OF WORK**

### **D23. JOB MEETINGS**

- D23.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.
- D23.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

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

- D24.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

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

- D25.1 Further to B10.4, 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 B10.4.

## **MEASUREMENT AND PAYMENT**

### **D26. PAYMENT**

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

## **WARRANTY**

### **D27. WARRANTY**

- D27.1 Notwithstanding C13.2, the warranty period shall begin on the date of Substantial Performance and shall expire 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.
- D27.2 Notwithstanding C13.2 or D27.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Substantial Performance if:
- (a) a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.
- D27.2.1 In such case the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

**FORM H1: PERFORMANCE BOND**  
(See 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. 742-2014

North East Exchange District 2014 Street Renewals  
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. 742-2014

North East Exchange District 2014 Street Renewals

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

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

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

\_\_\_\_\_ Canadian dollars.

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

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

Partial drawings are permitted.

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

\_\_\_\_\_  
(Address)

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

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

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

\_\_\_\_\_  
(Date)

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

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

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

\_\_\_\_\_  
(Name of bank or financial institution)

Per: \_\_\_\_\_  
(Authorized Signing Officer)

Per: \_\_\_\_\_  
(Authorized Signing Officer)



**FORM J: SUBCONTRACTOR LIST**  
 (See D13)

North East Exchange District 2014 Street Renewals

<u>Portion of the Work</u>	<u>Name</u>	<u>Address</u>
<b>SURFACE WORKS</b>		
<b>Supply of Materials:</b>		
Concrete		
Asphalt		
Base Course & Sub-Base		
Geotextile Materials		
Underground Materials (CB, CP, Frames and Covers)		
Trees/Shrubs/Ground Cover		
Paving Stone		
Streetscaping Furniture		
Window Well Grates		
Steel for Trellis		
Top Soil/Sod/Seed		
<b>Installation/Placement:</b>		
Concrete		
Asphalt		
Base Course & Sub-Base		
Geotextile Materials		
Underground Materials (CB, CP, Frames and Covers)		
Trees/Shrubs/Ground Cover		
Paving Stone		
Streetscaping Furniture		
Window Well Grates		
Steel for Trellis		
Top Soil/Sod/Seed		

**FORM L: DETAILED WORK SCHEDULE**  
 (See D14)

North East Exchange District 2014 Street Renewals

For each item of Work, indicate the proposed date that each cumulative percentage to be completed will be achieved.					
Items of Work	Percentage of Work Completed				
	Start	25%	50%	75%	100%
<i>Market Avenue from Rorie Street to Bertha Street</i>					
<i>Elgin Avenue from Lily Street to Bertha Street</i>					
<i>Bertha Walkway Corridor from Market Avenue to John Hirsch Place</i>					
<i>John Hirsch Place Walkway Corridor from Bertha Walkway Corridor to Bannatyne Avenue</i>					
<i>John Hirsch Place Walkway Corridor &amp; Bertha Walkway Corridor Seating Node</i>					

## 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
C01	Market Avenue	A1
C02	Elgin Avenue	A1
L1.1	Elgin, Market & Bertha Materials Plan	A1
L1.2	John Hirsch Demolition Plan/Bertha & John Hirsch Materials Plan	A1
L2.1	Market, Bertha & John Hirsch Planting & Furniture Plan	A1
L3.1	Paving Pattern Details	A1
L4.1	Market, John Hirsch, Bertha & Elgin Sections	A1
L4.2	Bertha & John Hirsch Stair & Ramp	A1
L4.3	Market Stair	A1
L4.4	John Hirsch Stair	A1
L5.1	Bertha Trellis & Greenscreen Details	A1
L5.2	Hardscape Details	A1
L5.3	Fencing, Furniture & Soft Landscaping Details	A1
S1.1	Market Stairs & Ramp	A1
S1.2	Bertha & John Hirsch Stair & Ramp	A1
S1.3	John Hirsch Stair	A1
S2.1	Bertha Trellis Details	A1
S3.1	Bertha Window Wells Details	A1
E1.0	Electrical Symbol Legend & Drawing List	A1
E1.1	Site Plan - Electrical layout	A1
E1.2	Electrical Specification	A1

#### E2. TRAFFIC CONTROL

- E2.1 Further to clauses 3.6 and 3.7 of CW 1130:
- (a) Where directed, 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 in Work Areas on City Streets, the Contractor ("Agency" in the manual) shall make arrangements with the Traffic Services Branch of the City of Winnipeg to place all temporary regulatory signs. The Contractor shall bear all 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.

### **E3. TRAFFIC MANAGEMENT**

E3.1 Further to clause 3.7 of CW 1130:

E3.1 Further to clause 3.7 of CW 1130:

E3.1.1 The Contractor shall schedule construction activities to meet the following:

- (a) On Market Avenue at least one lane for local access traffic shall be maintained along this street during construction.
- (b) On Market Avenue intersecting streets and private approach access shall be maintained at all times.
- (c) As per D19.1.2, work on Market Avenue and Elgin Avenue are not permitted to be performed at the same time. The Contractor must complete one street prior to beginning the next.
- (d) Access to John Hirsch Place is not to be disrupted.
- (e) Provide access to all surrounding parking lots at all times.

E3.1.2 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 24 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.

E3.1.3 Pedestrian and ambulance/emergency vehicle access must be maintained at all times.

### **E4. PEDESTRIAN SAFETY**

E4.1 During the project, on Market Avenue, a temporary snow fence shall be installed where open excavation for underground and road works is not monitored by the Contractor after working hours. The Contractor shall be responsible for maintaining the snow fence in a proper working condition. No measurement for payment shall be made for this work.

E4.2 Construction of walkway corridors will be properly fenced off and/or barricaded to prevent access from pedestrian traffic.

### **E5. WATER OBTAINED FROM THE CITY**

E5.1 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.

### **E6. SURFACE RESTORATIONS**

E6.1 Further to clause 3.3 of CW 1130, when Total Performance is not achieved in the year the Contract is commenced, the Contractor shall temporarily repair any Work commenced and not completed to the satisfaction of the Contract Administrator. The Contractor shall maintain the temporary repairs in a safe condition as determined by the Contract Administrator until permanent repairs are completed. The Contractor shall bear all costs associated with temporary repairs and their maintenance.

## **E7. INFRASTRUCTURE SIGNS**

- E7.1 The Contractor shall obtain infrastructure signs from the Traffic Services Sign Shop at 421 Osborne Street. The Contractor shall mount each sign securely to a rigid backing material approved by the Contract Administrator. The Contractor shall fasten each sign to a suitable support and erect and maintain one sign at each street as directed by the Contract Administrator. When the Contract Administrator considers the Work on the street complete, the Contractor shall remove and dispose of the signs and supports. No measurement for payment will be made for performing all operations herein described and all other items incidental to the work described

## **E8. PROVISIONAL ITEMS**

- E8.1 The Provisional Items listed in the Schedule of Prices are a part of the Contract.
- E8.2 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.
- E8.3 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

## **E9. TREE PROTECTION**

- E9.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing trees within the limits of the construction area. If you require further information on these specifications, please contact the City of Winnipeg Forestry Branch at 204-986-2004:
- (a) For trees greater than 100mm in diameter, attach wood strapping material having a minimum thickness of 25mm and minimum length of 2440mm around tree trunks in a manner that will not harm the trees. Do not use nails or other fasteners that penetrate into trees. The width of strapping should suit the size of the tree being protected. Length of strapping may be reduced to suit tree being protected as approved by the Contract Administrator.
  - (b) For trees less than 100mm in diameter, install snow fencing around the tree to a 2.0 meter radius complete with installation hardware. The 2.0 meter radius of the snow fencing may be reduced to suit the tree being protected as approved by the Contract Administrator.
  - (c) Operation equipment within the dripline of the trees shall be kept to the minimum required to perform the work. Equipment shall not be parked, repaired, refueled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of the 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.
  - (d) Repair replace and maintain tree protection material during construction of the Work.
  - (e) Remove snow fencing and strapping material without harming trees as soon as the construction and restoration work is completed.
- E9.2 Obtain approval from the Contract Administrator to excavate within 2.0 meters of a tree.
- E9.3 Excavate in a manner to minimize damage to root systems. Keep exposed roots in excavations and trenches moist or shaded.
- E9.4 Prune exposed roots with equipment such as trenchers, chain saws, root cutters or other methods acceptable to the Contract Administrator in a manner that will leave a neat, clean root end.

- E9.5 Take precautions to ensure tree limbs overhanging the Site are not damaged by construction equipment. Contact the Forestry Branch for consultation on pruning of overhanging or damaged limbs and branches and other unanticipated problems with trees during construction of the Works.
- E9.6 American elm trees are not to be pruned between April 1<sup>st</sup> and August 1<sup>st</sup> and Siberian elm trees between April 1<sup>st</sup> and July 1<sup>st</sup> of any year under provisions of The Dutch Elm Disease Act.
- E9.7 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the Forestry Branch. Damages must be repaired by an individual with a Manitoba Arborist licence or by the Forestry Branch.
- E9.8 The Forestry Branch will remove and replace any trees deemed to have died or that are dying due to damage from carelessness during construction. Removal and replacement costs will be determined by size, market price of the largest transplantable tree of same or different species and may include appraised value of existing tree as determined by current International Society of Arboriculture evaluation procedure presently used by Forestry Branch in conjunction with City Claims Branch. Estimated replacement cost of a 250 and 600mm diameter American elm on a boulevard based on an appraised value is approximately \$4,700.00 and \$27,000.00 respectively.
- E9.9 Measurement and Payment
- E9.9.1 Protection of existing trees, repair of trees and pruning of damaged limbs will not be measured for payment and will be included with Underground or Surface Works. Removal and replacement of existing trees by the Forestry Branch deemed to have died or that are dying due to damage from carelessness during construction will be at own costs and will be invoiced for or deducted from any payments owing.

## **E10. PRUNING OF EXISTING TREES**

- E10.1 Description
- E10.1.1 Provide all labour, materials, methods, equipment and accessories for pruning of existing trees within the limit of Work.
- E10.2 Quality Assurance
- E10.2.1 The Contractor shall provide a person with a Manitoba Arborists Certificate with demonstrable experience sourcing the Work.
- E10.2.2 Pruning shall be provided by a person with a Manitoba Arborists Certificate with demonstrable experience sourcing and Work.
- E10.2.3 Contact the City of Winnipeg Forestry Branch at 204-986-2004 to arrange an on site meeting to review trees to be pruned. Meeting to include the Contract Administrator.
- E10.3 Pruning Methodology
- E10.3.1 Prune as required to remove dead, broken or damaged limbs.
- E10.3.2 Prune back to healthy growth while maintaining balanced crown shape.
- E10.3.3 Employ clean sharp tools.
- E10.3.4 Make cuts smooth and flush with outer edge of branch collar near the main stem or branch.
- E10.3.5 Cuts must be smooth and sloping to prevent accumulation of water on cut.
- E10.3.6 Do not leave little stumps ("horns") on trunks or main branches.
- E10.3.7 Prune according to accepted horticultural practices as outline in "The Pruning Manual", Publication No. 1505-1977 by Agriculture Canada.
- E10.4 Measurement and Payment

- E10.4.1 Pruning of existing trees shall be paid for on a lump sum basis. Price shall be payment in full for supplying materials and for performing the Work.

## **E11. TREE VAULTS**

### **E11.1 Description**

- E11.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of tree vaults with precast concrete sidewalk panels and related excavation, granular drainage material, drainage pipe, pipe conduit, geotextile, planting medium, wood mulch and black granite mulch.

### **E11.2 Materials**

- E11.2.1 Granular drainage material in accordance with specification CW3120 - Installation of Sub Drains.
- E11.2.2 Drainage pipe: 150mm dia. perforated PVC pipe.
- E11.2.3 Pipe conduit: 150mm dia. PVC pipe.
- E11.2.4 Geotextile per CW3120.
- E11.2.5 Concrete materials and accessories in accordance with Specification CW 3310 – Portland Cement Concrete Pavement Works, to suit loads designed by Structural Engineer.
- E11.2.6 Precast Concrete Sidewalk Panel
- (a) 150mm thick reinforced precast concrete panel to accommodate AASHTO HS-20 loading. Manufacturer to supply shop stamped by a Structural Engineer.
  - (b) Medium sandblast finish for sidewalk panels.
  - (c) Precast concrete sidewalk panels supplied by Barkman Concrete Ltd, contact: Wayne Wiebe, ph. 204-667-3310.
- E11.2.7 Planting medium in accordance with specification Planting Medium and Finished Grading specification.
- E11.2.8 Wood mulch and black granite mulch in accordance with Trees, Shrubs & Groundcover Plantings specification.

### **E11.3 Submittals**

- E11.3.1 Prior to construction, submit samples of the following materials to the Contract Administrator:
- (a) Precast concrete sidewalk panel shop drawing.
  - (b) Geotextile: 1 sq. m.
- E11.3.2 Prior to installation, arrange for inspection and approval of the following materials by the Contract Administrator:
- (a) Precast concrete sidewalk panel.

### **E11.4 Construction Method**

- E11.4.1 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.
- E11.4.2 Soft dig around existing trees to determine extent of existing root system.
- E11.4.3 From extent of existing root system measure 400mm to create a temporary vertical subgrade wall barrier between the existing tree roots and the tree vault excavation.
- E11.4.4 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 / roadway drainage system (min 1.0% slope).

- E11.4.5 Remove roadway base and sub base where required to achieve width indicated on the Drawings. Do not remove any base or sub-base material within 450mm of back of curb.
- E11.4.6 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.
- E11.4.7 All excavated material shall be disposed of off site in accordance with specification CW1130.
- E11.4.8 Backfill between roadway base gravel and tree vault edge with compacted granular where required.
- E11.4.9 Install 150mm depth granular drainage course 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 into existing catch basin.
- E11.4.10 Cover drainage course and sides of tree pit with geotextile in accordance with specification CW3120 and as shown on the Drawings.
- E11.4.11 Install pipe conduit between tree vaults and raised planters. Pipe conduits are to connect tree vaults and raised planters together for future irrigation or electrical (by others).
- E11.4.12 Install geotextile and planting medium.
- E11.4.13 Remove temporary vertical subgrade wall barrier between the existing tree roots and tree vault and replace with planting medium.
- E11.4.14 After tree planting, ensure that finished soil level is 75mm below finished grade of sidewalk at trees to accommodate black granite mulch and 25mm below bottom edge of sidewalk panel.
- E11.4.15 Install sidewalk panels and tree covers ensuring edges are supported by tree well.

#### E11.5 Measurement and Payment

- E11.5.1 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, and geotextile. Over-excavation will not be paid.
- E11.5.2 Supply and install of precast concrete sidewalk panel will be measured on a unit each basis. Price shall be payment in full for supplying materials and for performing the Work.
- E11.5.3 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.
- E11.5.4 Pipe conduit shall be paid for on a lineal metre basis. Price shall be payment in full for supplying materials and for performing the Work.

## E12. REMOVALS

- E12.1 Further to Specification CW 3110 and due to the extent and nature of underground services in the street right-of-way, the Contractor shall be permitted to use only backhoe type equipment when excavating sub-grade material.
- E12.2 Further to Specifications CW 3230 and CW 3235, the Contractor shall sawcut and remove existing concrete sidewalk paving as shown on the Drawings and as directed by the Contract Administrator. The removal shall include all existing concrete and base course where applicable.



### E12.3 Description

E12.3.1 This Specification shall cover the removal and/or relocation of existing:

- (a) Concrete sidewalk;
- (b) Remove and disposal of wood lattice fence;
- (c) Removal of existing waste receptacle and bike loop and delivery to Public Works;
- (d) Removal of existing stairs and landing at #113 Market Avenue.

E12.3.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work hereinafter specified.

### E12.4 Equipment

E12.4.1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order.

### E12.5 Construction Methods

E12.5.1 The Contractor shall restrict his activities strictly to within the limits of the Works, unless receiving prior written approval from the Contract Administrator.

E12.5.2 The Contractor shall sawcut and remove existing concrete sidewalk paving. Sawcuts shall be straight and clean to be used as new edge of construction.

E12.5.3 The Contractor shall remove and dispose of the wood lattice fence as shown on within the limit of Work as shown on the Drawings.

E12.5.4 The Contractor shall remove existing waste receptacles, bike loop as shown on the drawings. Site furniture is to be delivered to City of Winnipeg storage facilities.

E12.5.5 The Contractor shall ensure that upon completion of the removal operations, the Site shall be left free of any hazardous depressions and in a neat condition.

E12.5.6 Upon removal of the stairs and landing at #113 Market Avenue the Contractor shall provide a temporary stair way or ramp for access to the entrance until construction of the new stairs and landing pad.

E12.5.7 If required and at locations directed by the Contract Administrator, the Contractor shall excavate and remove unsuitable subgrade material and replace it with compacted granular material in accordance with Specification CW3110.

### E12.6 Measurement and Payment

E12.6.1 Removal of concrete sidewalk paving will be measured and paid for at the contract square metre price for "Removal of Concrete Sidewalk", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E12.6.2 Removal and disposal of wood lattice fence will be measured and paid for at the contract linear metre price for "Removal of Wood Lattice Fence", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E12.6.3 Removal of existing waste receptacle and bike loop and delivery to Public Works will be measured and paid for at the contract lump sum price for "Removal of Existing Waste Receptacle and Bike Loop and Delivery to Public Works", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E12.6.4 Removal of the existing stairs and landing at #113 Market Avenue will measured and paid for at the contract lump sum price for "Removal of Existing #113 Market Avenue Stairs and

Landing", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification

### **E13. REMOVAL OF EXISTING UNIT PAVING STONE AND BRICK PAVER FOR DELIVERY TO PUBLIC WORKS**

#### **E13.1 Description**

E13.1.1 This Specification shall supplement Standard Construction Specification CW 3330 and shall cover all operations related to the removal and stockpiling of existing pavers for delivery to Public Works.

#### **E13.2 Construction Methods**

E13.2.1 Removal of existing pre-cast concrete unit paving stone and brick pavers for stockpiling and delivery to Public Works shall include removal of paving stones and base courses as required, disposal of unusable paving stone and base course material and stockpiling of paving stones in approved area for Public Works.

E13.2.2 Removal of interlock paving stone for delivery shall include the removal of paving stones and base courses as required, disposal of unusable paving stone and base course material and stockpiling of paving stones on wood pallets and delivery of paving stone to the address indicated below:

Pacific Avenue Yard  
1220 Pacific Avenue  
Winnipeg, MB R3E 1G6

E13.2.3 Any existing lean mix concrete base found is to be removed and disposed to City of Winnipeg Standards.

E13.2.4 Any existing lean mix concrete base at the limits of the designated area shall be sawcut for the full depth of the pavement prior to the demolition and removal operations. All costs in connection with sawcutting are incidental and shall be included in the unit price bid for "Removal and Stockpile of Unit Pavers for Delivery to Public Works".

E13.2.5 The Contractor shall exercise due caution during the Interlock paving stone removal Works so as to limit vibration. The Contractor shall take all necessary precautions when Working in the vicinity of any existing duct lines, trees, hedges, etc.

#### **E13.3 Measurement and Payment**

E13.3.1 Removal and stockpiling of existing unit pavers and delivery to Public Works will be measured on an area basis and will be paid for at the Contract Unit Price per square metre for "Removal and Stockpiling of Existing Unit Pavers and Delivery to Public Works" measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

### **E14. UNIT PAVING**

#### **E14.1 Description**

E14.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of stockpiled granite pavers in formed blockouts, stockpiled unit pavers on granular base, and the supply and installation of unit pavers and brick pavers in formed blockouts, as indicated on the Drawings.

#### **E14.2 References**

E14.2.1 CW3330 – Installation of Interlocking Paving Stones

E14.2.2 CW3335 – Installation of Interlocking Paving Stones on a Lean Concrete Base

### E14.3 Materials

E14.3.1 Stockpiled granite pavers shall be as shown on the Drawings and as follows:

- (a) 200 x 200 x 60mm granite.
- (b) 200 x 100 x 60mm granite.
- (c) 400 x 100 x 60mm granite.

E14.3.2 Stockpiled unit pavers.

E14.3.3 Concrete interlocking paving stones (unit pavers) shall be as shown on the Drawings and as follows:

- (a) Holland unit paver 210 x 105 x 60mm, colour: sierra grey.
- (b) Broadway unit paver 300 x 151 x 100mm, colour: buff.
- (c) Broadway unit paver 300 x 151 x 100mm, colour: charcoal.
- (d) Broadway unit paver 300 x 151 x 100mm, colour: mahogany.
- (e) Broadway 318 unit paver 451 x 75 x 100mm, colour: charcoal.
- (f) Unit pavers supplied by Barkman Concrete Ltd, contact: Wayne Wiebe, ph. 204-667-3310.

E14.3.4 Brick pavers shall be Endicott brick pavers as shown on the Drawings and as follows:

- (a) Dark Ironspot Endicott Brick Paver 194 x 93 x 57mm.
- (b) Brick pavers supplied by Alsip's Building Products and Services, contact: Jason Alsip, ph. 204-667-3330.

E14.3.5 Compacted granular base to CW3330.

E14.3.6 Bedding Sand

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

E14.3.7 Joint Sand

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

### E14.4 Construction Method

E14.4.1 Contractor to verify the exact dimensions of pavers prior to construction of blockouts in concrete sidewalk and roadway.

E14.4.2 Install concrete sidewalk and blockouts as specified on Drawings.

E14.4.3 Install compacted granular base (for area with stockpiled unit pavers only).

E14.4.4 Preparation of Sand Base

- (a) Install bedding sand to a minimum of 13mm as specified on the drawings and to CW3330.
- (b) Do not compact sand base prior to installing pavers.

E14.4.5 Installation of Stockpiled Granite Pavers, Stockpiled Unit Pavers, Unit Pavers and Brick Pavers

- (a) Confirm colour of unit pavers at existing Market and Lily pedestrian crosswalk. Review with Contract Administrator. All unit pavers for pedestrian crosswalk to match existing pedestrian crosswalk.
- (b) Stockpiled granite pavers, 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 5mm unless otherwise indicated, and shall be uniform and consistent while maintaining true patterns as indicated on the Drawings.

- (c) Stockpiled unit pavers shall be installed on compacted granular base in accordance with specification CW3335, set in locations and patterns as shown on the Drawings. Spaces between joints shall be 5mm and shall be uniform and consistent while maintaining true patterns as indicated on the Drawings.
- (d) Remove adjacent pavers in bands as required to ensure that pavers do not require cutting to fit existing paving pattern
- (e) Commence installation of pavers against edge to obtain straightest possible course for installation.
- (f) Pavers shall be cut with saw only to obtain true even undamaged edges. Chipped pavers are unacceptable.
- (g) Crews shall work on installed pavers, not on sand layer.
- (h) Spread and fine grade joint sand over paving surface and sweep into joints.
- (i) Sweep remaining sand over all paving areas and remove from site.
- (j) Replace at no extra cost all whole or cut stones marked as unacceptable.
- (k) Remove cracked, chipped, broken or otherwise damaged paving materials from Site immediately.
- (l) Upon completion, clean in accordance with manufacturers recommendations.

#### E14.5 Quality Assurance

- E14.5.1 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.

#### E14.6 Measurement and Payment

- E14.6.1 The supply and installation of stockpiled granite pavers, stockpiled unit pavers will be paid for at the Contract Unit Price per square metre as follows:
- (a) (a) Removal and Stockpile of Unit Pavers for reinstallation:
    - (i) Stockpiled Granite Paver
    - (ii) Stockpiled Unit Pavers
- Measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.
- E14.6.2 The supply and installation unit pavers will be measured on an area basis and will be paid for at the Contract Unit Price per square metre for "Supply and Installation of Unit Pavers" measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

### E15. REMOVAL AND STOCKPILE OF EXISTING GRANITE BOLLARDS FOR REINSTALLATION

#### E15.1 Description

- E15.1.1 This Specification shall cover all operations related to the removal and stockpiling of existing granite bollards for reinstallation.

#### E15.2 Materials

- E15.2.1 Stockpiled Granite Bollards

- (a) Existing Granite Bollard: 360 x 360 x 762mm.
- (b) Existing Steel Plate: 510 x 510 x 12mm stainless steel plate, matte finish.
- (c) New Welded Wire Mesh: 152 x 152 - MW9.1 x MW91.1, one (1) layer, available from Dupont Wire Ltd. (1-866-312-8540), or approved equal.
- (d) New Anchor Bolts: 12 x 100mm stainless steel anchor bolts.

#### E15.3 Construction Methods

E15.3.1 The Contractor shall remove and stockpile all granite bollards including base plates as shown on the Drawings or as directed by the Contract Administrator. The Contractor shall fill all holes from bollards and signs and replace with clean granular base course and compact to 98% SPD. The Contractor shall install asphalt as per CW3410 in all areas where landscaped island are removed as shown on the Drawings or as directed by the Contract Administrator.

E15.3.2 Review condition of steel plates with Contract Administrator. Steel plates that are damaged are to be repaired to ensure plate sits flat on top of concrete sidewalk. If steel plates are deemed unsalvageable due to excessive damage, Contractor to supply new steel plate and relevant components to match existing, at no additional cost to the City.

#### E15.4 Method of Measurement and Basis of Payment

E15.4.1 Removal and stockpile of existing granite bollards shall be measured on a unit basis and will be paid for at the Contract Price per unit for the "Removal and Stockpile of Existing Bollards for Reinstallation" measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

### E16. PLACEMENT OF UTILITY CONDUITS

#### E16.1 Description

E16.1.1 This specification will cover the placement of utility supplied conduits as identified on the drawings.

#### E16.2 Materials

E16.2.1 Conduit shall be supplied by the identified utilities.

E16.2.2 The Contractor shall contact the utility companies to obtain the conduits.

#### E16.3 Construction Methods

E16.3.1 Construct all work as shown on the Drawings or as directed by the Contract Administrator.

E16.3.2 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.

#### E16.4 Backfill General

E16.4.1 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.

E16.4.2 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.

E16.4.3 Place conduit in accordance with Section 3.11 of this specification.

E16.4.4 Place sand backfill on top of conduit in such a manner that the conduit is not bent or kinked.

E16.4.5 Tamp sand firmly from the sides of the conduit, down and under the conduit.

E16.5 Installation of Conduit

E16.5.1 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.

E16.5.2 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.

E16.5.3 Install conduits so that in no cases shall the conduit be formed into a bend radius of less than 500 millimetres.

E16.5.4 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.

E16.5.5 Open trench as directed by the Contract Administrator. The width of the trench shall be 200mm maximum, or in accordance with the drawings.

E16.5.6 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.

E16.5.7 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.

E16.5.8 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.

E16.6 Measurement and Payment

E16.6.1 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.

E16.6.2 Items of Work:

- (i) Installation of Conduit in Open Trench

E16.6.3 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.

- E16.6.4 No measurement or payment shall be made for Joining of Conduit.
- E16.6.5 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.
- E16.6.6 No measurement or payment shall be made for Manitoba Hydro safety watches.
- E16.6.7 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.

## **E17. CONCRETE PAVEMENT AND SIDEWALK CONSTRUCTION**

### **E17.1 Description**

- E17.1.1 This specification will cover this installation of concrete pavement and concrete sidewalk as identified on the drawings, including areas under paving patterns and fields.

### **E17.2 Materials**

- E17.2.1 Concrete mix design shall comply with Clause 6.2a) of CW 3310
- E17.2.2 All other materials as per Clause 5 of CW 3310.

### **E17.3 Construction Methods**

- E17.3.1 Construction as per Contract Drawings and as per CW 3310 and CW3325.
- E17.3.2 Blockouts for all paving patterns and paving fields in concrete pavement and sidewalk to be constructed as per the Drawings. All forming is incidental to the unit price Bid for this specification.
- E17.3.3 Thickened edge of concrete pavement and sidewalk will be incidental to the unit price Bid for the concrete sidewalk.

### **E17.4 Measurement and Payment**

- E17.4.1 Supply and Installation of 200mm concrete pavement will be measured on an area basis and paid for at the Contract Unit Price for "Construction of 200 mm Concrete Pavement (Reinforced)". The area to be paid for shall be the total number of square metres supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator.
- E17.4.2 Supply and Installation of concrete sidewalk will be measured on an area basis and paid for at the Contract Unit Price for "100 mm Concrete Sidewalk". The area to be paid for shall be the total number of square metres supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator.

## **E18. SOFT EXCAVATION TO EXPOSE UNDERGROUND UTILITIES**

### **E18.1 Description**

- E18.1.1 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.
- E18.1.2 These underground utilities include, but are not limited to, Manitoba Hydro cables, MTS cables, CPR, existing sewers, and existing watermains.

### **E18.2 Materials**

- E18.2.1 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.

#### E18.3 Construction Methods

- E18.3.1 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.
- E18.3.2 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.

#### E18.4 Measurement and Payment

- E18.4.1 Soft excavation to expose underground utilities will be considered incidental to the Work. No measurement and payment will be made within this section.

### E19. SAW CUTTING PAVEMENT

- E19.1 At the limits of excavation as directed by the Contract Administrator, the Contractor shall saw cut the existing pavement to produce a clean straight edge when excavated. The edge must be clean and straight prior to pouring new concrete pavement.

#### E19.2 Measurement and Payment

- E19.2.1 Sawcutting pavement and disposal of surplus material will be considered incidental to Clause 4.1 of CW 3110 "Pavement Removal." No measurement and payment will be made within this section.

### E20. EXTERIOR METAL FABRICATION

#### E20.1 Description

- E20.1.1 Provide all labour, materials, methods, equipment and accessories for the fabrication and installation of handrails and steel bollards.

#### E20.2 References

- E20.2.1 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.
- E20.2.2 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.

#### E20.3 Materials



- E20.3.1 Handrail
- (a) Handrail: 38mm T- 316L stainless steel seamless round tube.
  - (b) Handrail End Cap: 38mm dia. T-316L stainless steel to be welded and polished to seamless design.
  - (c) Post: 38mm T-316L stainless steel square tubing.
  - (d) Post Cap: 3mm T-316L stainless steel flat bar.
  - (e) Post Support: 20mm DIA. T-316L stainless steel round tube.
  - (f) Flange Cover: 107 x 107 x 19mm 16 gauge T-316L stainless steel.
  - (g) Plate: 101 x 101 x 6mm T-316L stainless steel.
  - (h) Anchor Bolts: 10 x 76mm stainless steel.
- E20.3.2 Structural Steel
- (a) The trellis post is required to have a minimum grade of 300W.
  - (b) The trellis post will be made of galvanized steel.
- E20.3.3 Steel Bollard
- (a) Post: to match trellis post (see E20.3.2).
  - (b) Base Plate: to match trellis base plate as per drawings.
  - (c) Anchor Bolts: to match trellis anchor bolts as per drawings.
  - (d) Levelling grout: contractor to provide a product for review by Contract Administrator.
- E20.3.4 Window Well Heavy Duty Steel Bar Grating
- (a) Steel used in bearing bars, cross bars and reticuline bars of rectangular section shall conform to ASTM A 1011/A 1011M, Commercial Steel (CS Type B) for hot rolled carbon steel sheet and strip and ASTM A 36/A 36M for structural steel bars.
  - (b) Cross bars made of wire rod shall conform to ASTM A 510 (A 510M) for carbon steel wire rods and coarse round wire, except that permissible tolerance on diameter of coarse round wire shall be  $\pm 0.005$  in. ( $\pm 0.13$  mm). Combinations of these steels are not prohibited from being welded together.
  - (c) Tru-Weld grating produced by Fisher & Ludlow is an accepted product for this use. The Contractor is permitted to provide an alternative to be approved by the Contract Administrator.
- E20.3.5 Accessories
- E20.3.6 Welding materials: to CSA W59.
- E20.3.7 Welding electrodes: to CSA W48 Series.
- E20.3.8 Caulk: GE Silicone II window and door caulking, clear, or approved equal.
- E20.4 Submittals
- E20.4.1 Submit product data, samples and shop drawings of the following to the Contract Administrator: handrail and steel bollard.
- E20.4.2 Clearly indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number and size of anchors, supports, reinforcement, details and accessories.
- E20.4.3 Indicate and list hardware and miscellaneous items.
- E20.4.4 Provide templates, patterns, fixing diagrams as required.
- E20.4.5 Indicate related, adjacent materials, and connections.
- E20.5 Delivery, Storage and Handling

- E20.5.1 Deliver materials to site, suitably packaged, clearly marked indicating manufacturer name and any other identifying symbols or information. Do not deliver materials long before they are required on site. Cause no delays to scheduling.
- E20.5.2 Cover exposed stainless steel and tempered glass surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
- E20.5.3 Leave protective covering in place until final cleaning of site. Provide instructions for removal of protective covering.
- E20.5.4 Store materials in a dry location off the ground, and prevent damage.
- E20.5.5 Materials that have been damaged or deemed unfit for use during delivery or storage shall be immediately replaced at no cost.
- E20.6 Site Conditions
  - E20.6.1 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.
  - E20.6.2 Report any discrepancies or omissions to the Contract Administrator, who will issue written clarification. Oral interpretations or instructions are not acceptable.
- E20.7 Construction Method
  - E20.7.1 Obtain approval of shop drawings prior to ordering materials and commencing fabrication.
  - E20.7.2 Fabricate work square, true, straight and accurate to required sizes, with joints closely fitted and properly secured.
  - E20.7.3 Use self-tapping, shake-proof, counter-sunk or hidden screws on items requiring assembly by screws.
  - E20.7.4 Where possible, fit and shop assemble work, ready for erection.
  - E20.7.5 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
  - E20.7.6 De-grease and be-bur all sharp edges in the shop left behind after fabrication is complete.
- E20.8 Installation
  - E20.8.1 Erect metalwork square, plumb, straight and true, accurately fitted, with tight joints and intersections.
  - E20.8.2 Provide suitable and acceptable means of anchorage, such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
  - E20.8.3 Handrail and steel bollards to be surface mounted to concrete sidewalk.
  - E20.8.4 Exposed fastening devices to match finish and be compatible with material through which they pass, as per the drawings.
  - E20.8.5 Do welding work in accordance with CSA W59, unless specified otherwise.
  - E20.8.6 Make field connections with high tensile bolts, or weld to CSA S16.1-M (latest).
  - E20.8.7 Touch up rivets, field welds, bolts and burnt or scratched surfaces after erection.
- E20.9 Acceptance
  - E20.9.1 Work will be accepted only if it is erected true to the design intent in conformation with shop drawings and site instructions.
- E20.10 Measurement and Payment

- E20.10.1 Supply and Installation of handrails will be measured on a linear metre basis and paid for at the Contract Unit Price for "Supply and Installation of Handrail". The length to be paid for shall be the total number of metres supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator.
- E20.10.2 Supply and Installation of steel bollards will be measured on a unit basis and paid for at the Contract Unit Price for "Supply and Installation of Steel Bollards". 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.
- E20.10.3 Supply and Installation of steel trellis will be measured on a lump sum bases and paid for at the Contract Unit Price for " Supply and Installation of Steel Trellis". The quantity to be paid for will be paid in full for the supply and placement in accordance with this Specification and as measure and accepted by the Contract Administrator.
- E20.10.4 Supply and Installation of window well heavy duty steel grating will be measure on a unit basis and paid for at the Contract Unit Price for "Supply and Installation of Window Well Heavy Duty Steel Grating". 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.

## **E21. EXTERIOR SITE CARPENTRY**

### **E21.1 Description**

- E21.1.1 Provide labour, materials, methods, equipment and accessories for the fabrication and installation of lattice screen fence.

### **E21.2 References**

- E21.2.1 American Wood-Preservers' Association (AWPA)
- (a) AWPA M2, Standard for Inspection of Treated Wood Products.
  - (b) AWPA M4, Standard for the Care of Preservative-Treated Wood Products
- E21.2.2 American Society for Testing and Materials International, (ASTM)
- (a) ASTM A53/A53M, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - (b) ASTM A269, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
  - (c) ASTM Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- E21.2.3 Canadian Standards Association (CSA International)
- (a) CSA B111, Wire Nails, Spikes and Staples
  - (b) CSA O141 Softwood Lumber
  - (c) CSA O80, Wood Preservation
  - (d) CSA O80.20, fire-retardant treatment of lumber by pressure processes
  - (e) CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel
  - (f) CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles
  - (g) CAN/CSA-S16.1, Limit States Design of Steel Structures.

### **E21.3 Materials**

#### **E21.3.1 Pressure Treated Wood**

- (a) Material: to be pressure treated wood, no. 1 grade, colour: brown, moisture content 19% or less in accordance with following standards: CAN/CSA-O141; NLGA Standard Grading Rules for Canadian Lumber; Forest Stewardship Council (FSC) certified.

- (b) Preservative for above ground use: to CSA-O80 Series, ACQ-C treatment, clear finish. Minimum net retention: 4.0 kg/m<sup>3</sup>.
- (c) Preservative for ground contact: to CSA-O80 Series, ACQ-C treatment, clear finish. Minimum net retention: 6.4 kg/m<sup>3</sup>.

E21.3.2 Pedra Wood

- (a) Material: pedra wood sanded four sides S4S.
- (b) Source and delivery: this material shall be from one supplier and shipped by rail.

E21.3.3 Hardware

- (a) Nails and spikes: to CAS B111, galvanized, for exterior works and for treated lumber. Use spiral thread nails.
- (b) Bolts nuts, washers, lag screws to be hot dipped galvanized, sizes to suit application.
- (c) Lag screws: hot dipped, galvanized, sizes to suit application.

E21.4 Submittals

E21.4.1 Submit product data and samples of the following to Contract Administrator: pedra wood and pressure treated wood.

E21.4.2 Shop Drawings

- (a) Submit shop drawings of the wood lattice fence.
- (b) Indicate dimensions, sizes, assembly, anchorage and installation details. Use construction drawings as reference. Confirm existing conditions on site by taking as-built field measurements to prepare shop drawings.
- (c) Clearly indicate materials, core thickness, finishes, connections, joints, method of anchorage, number and size of anchors, supports, reinforcement, details and accessories.

E21.5 Quality Assurance

E21.5.1 Carpentry shall be performed by trained and qualified craftspeople with demonstrable experience sourcing and work.

E21.5.2 Conduct a pre-installation meeting with the Contract Administrator to verify requirements.

E21.5.3 Lumber Identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

E21.5.4 For products treated with preservative by pressure impregnation, submit following information certified by authorized signing officer of treatment plant:

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

E21.5.5 All wood to be free of defects. Any warped, checked or bent materials will be rejected.

E21.6 Construction Method

E21.6.1 Handle and use treated and non-treated wood in a manner which will avoid damage or field fabrication causing alteration in original treatment.

E21.6.2 Re-treat pressure treated wood surfaces exposed by cutting, trimming or boring with liberal brush application of clear preservative and fire retardant before installation. Ensure that damaged areas such as abrasions, nail and spike holes, area thoroughly saturated with field treatment solutions as per CSA-O80 and CSA-O80.20

E21.6.3 Construct all work as indicated on the drawings using adequate fastening methods to ensure solid durable finished work suitable for the purpose intended.

- E21.6.4 Do all nailing and fastening neatly, evenly and thoroughly.
- E21.6.5 Frame anchor, fasten, tie and brace members to provide necessary strength and rigidity. Install all members true to line, levels and elevations.
- E21.6.6 Set plumb and space uniformly. Countersink bolts where necessary to provide clearance for other work.
- E21.7 Measurement and Payment
- E21.7.1 Supply and Installation of lattice screen fence will be measured on a linear metre basis and paid for at the Contract Unit Price for "Supply and Installation of Lattice Screen Fence". The length to be paid for shall be the total number of metres supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator.

## **E22. EXTERIOR METAL PAINTING**

- E22.1 Description
- E22.1.1 Provide all labour, materials, methods, equipment and accessories for the painting of the trellis, steel bollards, junction boxes, and electrical conduit.
- E22.2 References
- E22.2.1 Painting for Exterior Applications:
- (a) SSPC – Steel Structures Painting Council.
  - (b) CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
  - (c) CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.
- E22.3 Materials
- E22.3.1 Exterior Grade Paint Coatings for Metal Surfaces (Trellis and Steel Bollards):
- (a) Tremclad 27048X 125 Flat Black.
- E22.4 Submittals
- E22.4.1 Product Data: Submit two copies of WHMIS MSDS - Material Safety Data Sheets for paint product.
- E22.5 Samples
- E22.5.1 Submit one (1) sample of finished paint on W200 x 46 steel post 300mm long. Sandblast, clean and paint with specified colour to 1/3 of the overall sample length. Sample will be subject to durability testing and coating thickness review by the Contract Administrator. Once approved the sample will become the standard of finish for all exterior metal painting.
- E22.6 Quality Assurance
- E22.6.1 Painter shall be trained and qualified industrial metal painting professionals with more than five (5) years of experience. Shop must be ISO certified and fully equipped to prepare, prime and paint large scale structural metal members and deliver them to site for field erection.
- E22.6.2 All workmanship and all materials furnished and supplied under this specification shall be of the highest standards and are subject to close and systematic inspection and testing by the Contract Administrator including all operations, from the selection of materials, through to final acceptance of the Work.
- E22.6.3 Strict conformance to this specification will be enforced. 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 the requirements of this specification.

#### E22.7 Construction Method

- E22.7.1 Ensure that sample is approved prior to proceeding.
- E22.7.2 Preparation, priming and painting of members shall be completed in the controlled environment of a paint shop if at all possible. If painting operations must occur in the field obtain Contract Administrators to review the Work that is to be completed in the field, prior to proceeding.
- E22.7.3 Debur and degrease metal surfaces using products approved by the paint manufacturer.
- E22.7.4 Conduct abrasive blasting to fully clean the metal.
- E22.7.5 Pressure wash metal in accordance with all Federal, Provincial and local water consumption and disposal regulations.
- E22.7.6 Contact Contract Administrator for review and approval of prepared surface.
- E22.7.7 Conduct abrasive blasting a second time to fully clean the metal if first inspection of cleaned surface reveals imperfections or early signs of rust.
- E22.7.8 Paint shall be stored, thinned, handled, mixed and applied in accordance with SSPC-PA 1, Shop Field and Maintenance Coating of Steel, and per the express written specifications of the manufacturer.
- E22.7.9 Apply paint coats only when temperatures can be controlled or predicted to be within the manufacturers acceptable window. When there is a drop in temperature after the coating is applied adjust recoat time period per manufacturers specifications.
- E22.7.10 Paint shall be applied within 24 hours of completion of surface preparation.
- E22.7.11 Use spray gun system for main application and brushes of suitable size for field touch ups. Point spray gun at outside edges coating edges and seams thoroughly prior to coating remaining areas.
- E22.7.12 Touch-up runs and snags immediately while paint application is in progress.
- E22.7.13 Application related failures shall be corrected prior to the application of a subsequent coat.
- E22.7.14 Where excessive coating thickness produces 'Mud Cracking' coating shall be scraped back to bare metal, and sanded to a soundly bonded coating layer then reapplied to the specified thickness.
- E22.7.15 Apply as many coats as necessary to ensure even and proper coating of metal, to be reviewed and approved by the Contract Administrator.

#### E22.8 Delivery to Site

- E22.8.1 Allow all shop painted members to fully cure before preparing for shipment.
- E22.8.2 Once fully cured wrap members in cellophane plastic or bubble wrap designed to protect finished surfaces without scratching or marring them during transport. Secure wrappings with appropriate tape or adhesives that are sturdy but can easily be removed at the site.
- E22.8.3 Deliver to site with equipment suitable for carrying steel loads and capable of hoisting steel members over other features into their final locations.

#### E22.9 Touch-Ups

- E22.9.1 Ensure all welding work and mechanical fasteners are wiped clean and free of oil, debris and grit.
- E22.9.2 Apply touch-ups with appropriately sized brushes to get into all grooves and voids.
- E22.9.3 Thickness of touch-ups shall match thickness of adjacent paint.

E22.9.4 Once all touch-ups are complete contact Contract Administrator for review and approval of metal work and coating.

E22.10 Standard of Acceptance

E22.10.1 Products shall be accepted if they meet the performance standards of the product supplier and match the sample accepted as the standard of performance at the commencement of painting.

E22.10.2 Painted surfaces shall be warrantied against corrosion, peeling and general failure for two (2) years after date of total performance.

E22.11 Final Acceptance

E22.11.1 Provide the City of Winnipeg with maintenance manual inserts detailing products and methods used to achieve metal painting finishes.

E22.11.2 Provide City of Winnipeg with one (1) gallon of paint.

E22.12 Measurement and Payment

E22.12.1 Painting of the trellis, steel bollards, junction boxes, electrical conduits and anchor bolts will not be measured for payment and will be included in the supply and install of the trellis, steel bollards and lighting components.

**E23. SALVAGE AND REINSTALLATION OF EXISTING RAIL LINES IN CONCRETE BLOCKOUTS**

E23.1 Description

E23.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of rail line in concrete blockouts.

E23.2 Materials

E23.2.1 Rail line from stockpile: tee-rail: 4-1/4" height x 4-1/4" base width x 2-3/8" width of head.

E23.2.2 60# ASCE Enclosed Flangeway

- (a) 6mm thick rail pad (width to be confirmed by supplier).
- (b) Epflex Railseal field side on either side of rail.
- (c) 62 rail clip and bolt (bolt sizes to be confirmed by supplier).
- (d) Supplied by Polycorp Ltd., contact: John Hale, ph. 1-800-265-2710.
- (e) Geotextile per CW3120.

E23.3 Submittals

E23.3.1 Submit product data and samples to the Contract Administrator for:

- (a) Rail pad.
- (b) EPflex Railseal, field side.
- (c) 62 rail clip and bolt.
- (d) Geotextile.

E23.3.2 Submit shop drawings to the Contract Administrator for:

- (a) 60# ASCE Enclosed Flangeway.
- (b) Clearly indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number and size of anchors, supports, reinforcement, details and accessories.
- (c) Indicate and list hardware and miscellaneous items.

- (d) Provide templates, patterns, fixing diagrams as required.
- (e) Indicate related, adjacent materials, and connections.

#### E23.4 Delivery, Storage and Handling

- E23.4.1 Deliver materials to site, suitably packaged, clearly marked indicating manufacturer name and any other identifying symbols or information. Do not deliver materials long before they are required on site. Cause no delays to scheduling.
- E23.4.2 Store all materials in a dry location off the ground, and prevent damage.
- E23.4.3 Materials that have been damaged or deemed unfit for use during delivery or storage shall be immediately replaced at no cost.

#### E23.5 Site Conditions

- E23.5.1 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.
- E23.5.2 Report any discrepancies or omissions to the Contract Administrator, who will issue written clarification. Oral interpretations or instructions are not acceptable.

#### E23.6 Construction Method

- E23.6.1 Salvage of Existing Rails
- E23.6.2 The Contractor shall salvage existing rail lines on Elgin Avenue in a manner to preserve their integrity and minimize deflection of the lines.  
  
The Contractor shall carefully expose the concrete bedding and/or rail ties to determine the existing method of connection in order to determine removal.  
  
Prior to removal the Contractor shall contact the Contract Administrator to be on site during removal.  
  
Existing rail ties shall be removed and disposed of off site.  
  
Once removed the rails shall be stored in a secure location that will maintain existing integrity of the rails.
- E23.6.3 Reinstallation of Rails in Concrete Blockouts  
  
Obtain approval of shop drawings prior to ordering materials and commencing installation.  
  
All work is to be located and installed in accordance with the Drawings and manufacturers specifications.

#### E23.7 Measurement and Payment

- E23.7.1 The salvage and reinstallation of rail line in concrete blockouts, and 60#ASCE enclosed flangeway shall be paid for on a linear metre basis and paid for at the Contract Unit Price for "Items of Work" as described below:
  - (i) Salvage and Reinstallation of Rails in Concrete Blockout
  - (ii) Supply and Installation of 60#ASCE Enclosed Flangeway  
The length to be paid for shall be the total number of metres supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator.
- E23.7.2 Removal of concrete rail ties will be measured on a cubic metre basis and paid for at the Contract Unit Price for "Removal of Concrete Rail Ties". The volume to be paid for shall be the total number of cubic metres removed in accordance with this Specification and as measured and accepted by the Contract Administrator.



## **E24. DETECTABLE STRIPS**

- E24.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of detectable strips.
- E24.2 Materials
  - E24.2.1 Detectable Strips: R300 single component stair nosing, colour: black, available from Balco Inc. ph. 1-800-767-0082.
- E24.3 Construction Method
  - E24.3.1 Install detectable strips per manufacturers written specifications.
- E24.4 Measurement and Payment
  - E24.4.1 The supply and installation of detectable strips shall be paid for on a linear metre basis and paid for at the Contract Unit Price for "Detectable Strips - Balco R300 Single Component Stair Nosing, Black Colour". The length to be paid for shall be the total number of metres supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator.

## **E25. PAVEMENT STAINING**

- E25.1 Description
  - E25.1.1 Provide all labour, materials, methods, equipment and accessories for the chemical staining of pavement.
- E25.2 Materials
  - E25.2.1 Lithicrome chemistain classic, colour: CS-1 black, available form Brock White ph., 204-694-3600.
- E25.3 Submittals
  - E25.3.1 Submit product data and MSDC for Lithicrome chemistain classic.
  - E25.3.2 Submit sample of Lithicrome chemistain classic, colour CS-1 black, applied to broom finished concrete to CW3310.
- E25.4 Construction Methods
  - E25.4.1 Install per manufacturers written specifications.
- E25.5 Measurement and Payment
  - E25.5.1 Chemical etching shall be paid for on a square metre basis and paid for at the Contract Unit Price for "Chemical Etching - Lithicrome Chemistain Classic, CS-1 Black Colour". The area to be paid for shall be the total number of square metres applied in accordance with this Specification and as measured and accepted by the Contract Administrator.

## **E26. SITE FURNISHINGS**

- E26.1 Description
  - E26.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and install of benches, and greenscreen panels.
- E26.2 Submittals
  - E26.2.1 Submit product data for Greenscreen panel.
  - E26.2.2 Submit sample of greenscreen panel including colour and finish.

E26.2.3 Submit shop drawings for greenscreen panel. Indicated sizes, assembly, method of anchorage to trellis, and installation details. Use Drawings and as-built field measurements to prepare shop drawings.

**E26.3 Materials**

**E26.3.1 Bench**

- (a) Victor Stanley Inc. Classic Series C-140 with centre arm rest, black powdercoated, IPE hardwood slats. Supplied by Victor Stanley inc., contact: David Skalka 1-800-368-2573.
- (b) Anchor Bolts for Benches on Concrete Sidewalk: 6mm dia. x 100mm stainless steel anchor bolts.
- (c) Anchor Bolts for Benches on Unit Pavers in Concrete Blockout: 6mm dia. x 200mm stainless steel anchor bolts.

**E26.3.2 Greenscreen Panels**

- (a) 3049 x 1070 x 75mm Greenscreen panels mounted to steel trellis I-beam. Finish: wrinkled black. Available from Architek Sustainable Building Products Inc., contact: Ron Schwenger ph. 888-317-5585.

**E26.4 Construction Methods**

E26.4.1 All work is to be located and installed in accordance with the Drawings and manufacturers specifications.

E26.4.2 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.

E26.4.3 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.

E26.4.4 Review condition of steel plates with Contract Administrator. Steel plates that are damaged are to be repaired to ensure plate sits flat on top of concrete sidewalk. If steel plates are deemed unsalvageable due to excessive damage, Contractor to supply new steel plate and relevant components to match existing, at no additional cost to the City.

**E26.4.5 Greenscreen Panel Installation**

- (a) Measure as-built conditions and verify Greenscreen panel sizes prior to ordering.
- (b) Provide shop drawing to Contract Administrator. Do not proceed with construction until shop drawings are reviewed by Contract Administrator.
- (c) Install Greenscreen panels as per manufacturers written specifications.
- (d) Touch-up up damaged finishes to approval of the Contract Administrator.

**E26.5 Measurement and Payment**

E26.5.1 The supply and installation of benches and Greenscreen panels shall be paid for on a unit each basis. Price shall be payment in full for supplying materials and for performing the Work.

**E27. PLANTING MEDIUM & FINISH GRADING**

**E27.1 Description**

E27.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of planting medium in tree vaults and planting beds.

**E27.2 References**

#### E27.2.1 Agriculture and Agri-Food Canada

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

#### E27.2.2 Canadian Council of Ministers of the Environment (CCME) Guidelines.

#### E27.2.3 The City of Winnipeg Standard Construction Specifications

.1 CW 1130 – Site Requirements

.2 CW 3540 – Topsoil and Finish Grading for Establishment of Turf Areas

#### E27.3 Submittals

E27.3.1 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.

E27.3.2 Submit two (2) copies of soil analysis and recommendations for corrections to Contract Administrator.

#### E27.4 Quality Assurance

E27.4.1 Inform Contract Administrator of proposed source of materials to be supplied and provide a sample for review by Contract Administrator prior to installation.

E27.4.2 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.

E27.4.3 Test planting medium for nutrients N, P, K, micronutrients, soluble salt content, pH value and OM (organic matter).

E27.4.4 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.

#### E27.5 Delivery, Storage and Handling

E27.5.1 Store materials in a dry area, protected from freezing, sedimentation and contamination.

E27.5.2 Deliver and store fertilizer in waterproof bags labeled with weight, analysis and name of manufacturer.

#### E27.6 Materials

E27.6.1 Planting Medium: In accordance with CW 3540 for topsoil except organic matter to be in the range of 5-10%.

E27.6.2 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.

E27.6.3 Sand: hard fine silica sand, well washed and free of impurities, chemical or organic matter. Coarse texture, and to the following gradation:

Particle Size (mm)	% Passing through Screen
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%

E27.6.4 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 m<sup>2</sup> which is 8 pounds per 100 sq ft.

## E27.7 Construction Method

### E27.7.1 Excavation

- (a) Excavate tree vaults and planting beds 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 enters excavations and planters prior to planting. Ensure source of water is not groundwater.
- (d) Scarify bottom of planting beds to a depth of 150mm.
- (e) Cover bottom of tree pit and planting bed with bone meal fertilizer.
- (f) Verify and obtain approval by Contract Administrator of tree vaults with geotextile and planting beds prior to compacted soil mound and planting medium placement

### E27.7.2 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.

### E27.7.3 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.

### E27.7.4 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.

## E27.8 Surplus Material

### E27.8.1 Dispose of unused planting medium off Site in accordance with CW1130.

## E27.9 Cleaning

### E27.9.1 Perform cleaning to remove accumulated environmental dirt from all paved surfaces of building faces. Remove surplus materials, rubbish, tools and equipment barriers.

## E27.10 Measurement and Payment

### E27.10.1 Planting Medium shall be paid for a cubic metre basis. Price shall be payment in full for supplying materials and for performing the Work.

## **E28. TREES, SHRUBS, AND GROUNDCOVER PLANTINGS**

### E28.1 Description

#### E28.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of trees, shrubs, groundcovers, vines, perennials, wood mulch, and black granite mulch.

### E28.2 References

#### E28.2.1 Agriculture and Agri-Food Canada (AAFC)

- (a) Plant Hardiness Zones in Canada-2000.

#### E28.2.2 Canadian Nursery Landscape Association (CNLA)

- (a) Plant Canadian Standards for Nursery Stock-2001.
- E28.2.3 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.
- E28.2.4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - (a) Materials Safety Data Sheets (MSDS).
- E28.3 Submittals
- E28.3.1 Submit product data for:
  - (a) Fertilizer.
  - (b) Wood mulch.
- E28.3.2 Submit samples for:
  - (a) Wood mulch.
  - (b) Black granite mulch.
- E28.4 Source Quality Control
- E28.4.1 Obtain approval from Contract Administrator of plant material at source.
- E28.4.2 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.
- E28.4.3 Acceptance of plant material at source does not prevent rejection on Site prior to or after planting operations.
- E28.4.4 Plant material imported from other nations will not be accepted.
- E28.4.5 Bare root plant material will not be accepted.
- E28.5 Storage and Protection
- E28.5.1 Coordinate the shipping of plants and excavation of holes to ensure minimum time laps between digging and planting.
- E28.5.2 Protect plant material from frost, excessive heat, wind and sun during delivery.
- E28.5.3 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.
- E28.5.4 Protect stored plant material from frost, wind and sun as follows:
  - (a) For bare root plant material, preserve moisture around roots by heeling-in or burying roots in topsoil and watering to full depth of root zone.
  - (b) For pots and containers, maintain moisture level in containers.
  - (c) For balled and burlapped and wire basket rootballs, place to protect branches from damage. Maintain moisture level in root zones.
- E28.5.5 Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 20mm (3/4") diameter with wound dressing.
- E28.5.6 Keep roots moist and protect from sun and wind. Heel-in trees that cannot be planted immediately in shaded areas and water well.

## E28.6 Scheduling

- E28.6.1 Order plant material as soon as possible after award of contract to ensure plant availability. Request substitutes as required.
- E28.6.2 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.

## E28.7 Warranty of Nursery Stock

- E28.7.1 For all plant material an eighteen (18) month warranty period is required.
- E28.7.2 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.
- E28.7.3 End-of-Warranty inspection will be conducted by Contract Administrator.
- E28.7.4 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.

## E28.8 Replacements

- E28.8.1 During warranty period, remove from Site any plant material that has died or failed to grow satisfactorily as determined by the Contract Administrator.
- E28.8.2 Extend warranty on replacement plant material for a period equal to the original warranty period.
- E28.8.3 All required replacements shall be by plants of at least the same size and species as specified, and shall be supplied and planted in accordance with the original Drawings and Specifications.
- E28.8.4 Should the replaced plant material not survive, the Contractor will be responsible to replace it a third time and guarantee it for a period equal to the original warranty period unless it is determined that unique Site conditions or inadequate maintenance causes the death of plants

## E28.9 Plant Material

- E28.9.1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
- E28.9.2 Source of plant material: grown in Zone 3 only in accordance with Plant Hardiness Zones in Canada.
- E28.9.3 Plant material must be planted in zone indicated as appropriate for its species.
- E28.9.4 Plant material free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.
- E28.9.5 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.
- E28.9.6 Refer to Plant Specification List on the Drawings and the Drawings for species, quantities, size and quality of plant materials.

## E28.10 Water

- E28.10.1 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.
- E28.10.2 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.
- E28.11 Planting Medium: backfill with planting medium as specified in Planting Medium Specification.
- E28.12 Stakes: 76mm dia. x 2440mm ht. wooden stakes.
- E28.13 Heavy duty Baler Twine: Polypropylene baler twine, UV protected.
- E28.14 Tree Tie: biodegradable or polyethylene fabric strapping min. 3bmm wide.
- E28.15 Guying Wire: 9 gauge, flexible, non-corrosive strand wire.
- E28.16 Wire Tightener: PG wire tightener.
- E28.17 Clamps: U- bolt: galvanized, 12mm (1/2")  $\varnothing$ , c/w curved retaining bar and hex nuts.
- E28.18 Anchor: Drive-in Type: 12mm (1/2")  $\varnothing$  x 300mm (12") long, aluminum.
- E28.19 Tree Protection: Plastic, 13 mm  $\varnothing$ , nylon reinforced garden hose over guy wire.
- E28.20 Flagging Tape: Fluorescent, orange or red colour.
- E28.21 Anti-Desiccant: wax-like emulsion.
- E28.22 Wood Chip Mulch: wood chip mulch varying in size from 50 mm to 75 mm and 5 to 20 mm thick, free of bark. Wood chip shall be mulched locally within 80 km of the Site,
- E28.23 Black Granite Mulch: granite mulch, black in colour.
- E28.24 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 m<sup>2</sup> which is 8 pounds per 100 sq ft.
- E28.25 Pre-Planting Preparation
- E28.25.1 Obtain approval from Contract Administrator of finish grading, and planting medium installation prior to commencing Work in this section.
- E28.25.2 Ensure plant material is acceptable to the Contract Administrator.
- E28.25.3 Remove damaged roots and branches from plant material with sharp clean equipment treating wounds as necessary to maintain plant health.
- E28.25.4 Apply anti-desiccant to deciduous trees in leaf in accordance with manufacturer's instructions.
- E28.26 Plant Material Layout
- E28.26.1 Prepare planting beds. Refer to Planting Medium Specification.
- E28.26.2 Lay out plants in pots on beds for Contract Administrator approval prior to installation.
- E28.26.3 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.
  - (c) Remove rocks, roots, debris and toxic material from the tree pit.
  - (d) Scarify sides of planting hole.

- E28.26.4 For shrubs, shrubs, groundcovers, vines, perennials:
- (a) Lay out plants per drawings carefully ensuring spacing specified on the Drawings.
  - (b) Obtain Contract Administrator approval of plant layouts and make any necessary adjustments on Site.
- E28.26.5 Remove water which enters excavations or planting beds prior to planting. Notify Contract Administrator if water source is groundwater.
- E28.27 Planting
- E28.27.1 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.
- E28.27.2 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.
- E28.27.3 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.
- E28.27.4 For trees and shrubs:
- (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.
- E28.27.5 For groundcovers, vines and perennials: backfill soil evenly to finish grade and tamp to eliminate air pockets.
- E28.27.6 Water plant material thoroughly. Report extreme ponding in planters indicative of malfunctioning drains to the Contract Administrator immediately.
- E28.27.7 After soil settlement has occurred, fill with soil to finish grade.
- E28.27.8 Dispose of burlap, wire and container material off Site.
- E28.28 Tree Supports
- E28.28.1 Install tree supports as indicated on the Drawings taking care not to damage or puncture underground utilities.
- E28.28.2 Use double stake tree support for deciduous trees:
- (a) Place first stake on prevailing wind side of tree trunk.
  - (b) Drive stakes minimum 150mm into undisturbed soil beneath bottom of roots. Ensure stakes are secure, vertical and unsplit.
  - (c) Install tree tie 1500mm above grade.
- E28.28.3 Use three (3) guy wires and anchors for coniferous trees:
- (a) Install guying collars above branch to prevent slipping at approximately two thirds of plant height for evergreens. Collar mounting height is not to exceed 2.44m (8') above grade.
  - (b) Guying collars to be of sufficient length to encircle tree plus 50mm (2") space for trunk clearance. Thread guy wire through collar encircling tree trunk and secure to lead wire by clamp or multi-wraps; cut wire ends close to wrap. Spread lead wires equally proportioned about trunk at 120°.
  - (c) Install anchors at equal intervals about tree and away from trunk so that guy wire will form 30° angle with ground. Install anchor at angle to achieve maximum resistance for guy wire.  
Attach guy wire to anchors. Tension wire and secure by multi-wraps installing clamps.



- (d) .5 Install wire tightener ensuring that guys are secure and leave room for slight movement of tree.
- (e) Install fluorescent flagging tape to guys as indicated.

**E28.29 Pruning**

- E28.29.1 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.

**E28.30 Mulching**

- E28.30.1 Obtain approval of planting placement from Contract Administrator before mulching material is applied.
- E28.30.2 Ensure soil settlement has been corrected prior to mulching.
- E28.30.3 Spread wood chip mulch as indicated on all planting beds. Spread mulch to minimum thickness of 75mm.
- E28.30.4 Spread black granite mulch to the locations and levels indicated on the Drawings.

**E28.31 Maintenance**

- E28.32 Maintain plant material from date of planting to the end of the warranty period. Refer to Landscape Maintenance Specification.

**E28.33 Measurement and Payment**

- E28.33.1 Trees, shrubs, groundcovers, vines, and perennials shall be paid for on a unit each basis. Price shall be payment in full for supplying materials and for performing the Work.
- E28.33.2 Wood mulch and black granite mulch shall be paid for on a square metre basis. Price shall be payment in full for supplying materials and for performing the Work.

**E29. LANDSCAPE MAINTENANCE**

**E29.1 Description**

- E29.1.1 Provide all labour, materials, methods, equipment and accessories for the maintenance of trees, shrubs, groundcovers, vines, and perennials following acceptance of the plant material to start warranty.
- E29.1.2 In general, the Work shall include:
- (a) Fertilizing
  - (b) Watering
  - (c) Weed Control
  - (d) Pest and disease Control
  - (e) Mulching
  - (f) Winter Preparation
- E29.1.3 Maintenance shall be performed on an as required basis.

**E29.2 Maintenance and Warranty Period**

- E29.2.1 Maintenance shall occur between the date of installation and up to a period of two (2) years from date landscaped areas are accepted to start warranty. The warranty period for plant materials will be coincidental to the maintenance period.

E29.2.2 Thirty days after the planting installation has been completed, the Contract Administrator shall perform an inspection of the plant material to determine if the plant material is acceptable to start warranty.

### E29.3 Materials and Equipment

E29.3.1 Materials shall conform to the requirements of related Specification sections.

E29.3.2 Provide all equipment to properly execute Work. Maintain such equipment in a workable, safe condition while in use during this project.

E29.3.3 Contract Administrator shall review equipment to be used to execute Work prior to execution.

### E29.4 Method

#### E29.4.1 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.

#### E29.4.2 Maintenance of Trees, Shrubs, Groundcovers, Vines, and Perennials:

- (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) Mulching: add mulch as required to maintain original thickness. Contractor is to provide replacement mulch material.
- (g) Winter Preparation: Ensure adequate moisture in tree root zones prior to freeze-up.

#### E29.5 Measurement and Payment

E29.5.1 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

### E30. CAST-IN-PLACE CONCRETE

#### E30.1 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.

#### E30.2 Materials

##### E30.2.1 General

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

##### E30.2.2 Handling and Storage of Materials

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

##### E30.2.3 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.

##### E30.2.4 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.

E30.2.5 Cement

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

E30.2.6 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 = 35 MPa
  - (iii) Water / Cementing Materials Ratio = 0.4
  - (iv) Air Content: Category 2 per Table 4 of CSA A23.1-04 (4-7%)
  - (v) Cement – shall be as specified in E30.2.5.
- (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.

E30.2.7 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.

#### E30.2.8 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.

#### E30.2.9 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.

#### E30.2.10 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.

#### E30.2.11 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.

E30.2.12 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.

E30.2.13 Anchor Rods, Nuts, and Washers

- (a) All anchor rods shall be threaded-type.
- (b) Anchor rods, nuts and washers shall be in accordance with ASTM F1554 and shall be hot-dip galvanized in accordance with CSA Standard G164 for a minimum net retention of 600 g/m<sup>2</sup>. Supply and installation will be incidental to construction of concrete foundation and no separate payment will be made.
- (c) It is the Contractor's responsibility to ensure that the threaded rods are not in direct contact with the foundation reinforcing steel.

E30.2.14 Anchor Rod Templates

- (a) Anchor rod templates shall be CSA G40.21 Grade 300W, minimum 10 mm thick, and will be incidental to construction of new concrete foundation and no separate payment will be made.

E30.2.15 Fibre Joint Filler

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

E30.2.16 Waterproofing Membrane

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

E30.2.17 Miscellaneous Materials

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

E30.3 Construction Methods

E30.3.1 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.

E30.3.2 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.

#### E30.3.3 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.

#### E30.3.4 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.

#### E30.3.5 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.

#### E30.3.6 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.

#### E30.3.7 Placing Metal Bases

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

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

#### E30.3.8 Forms

- (a) Forms for exposed surfaces that require an "ordinary surface finish" shall be made of good quality plywood, or an approved equivalent, of 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 Dranoform, 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.

#### E30.3.9 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 110 mm. The concrete shall be vibrated throughout the entire length of the foundation.
- (b) Concrete shall be placed to the elevations as shown on the Drawings. The top surface of the foundation shall be finished smooth and even with a hand float.
- (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.

#### E30.3.10 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.



#### E30.3.11 Construction Joints

- (a) Construction joints shall be located only where shown on the Drawings or as otherwise approved in writing by the Contract Administrator. Construction joints shall be at right angles to the direction of the main reinforcing steel. All reinforcing steel shall be continuous across the joints. Bevelled shear keys, as shown on the Drawings or approved by the Contract Administrator, shall be provided at all joints.
- (b) In lieu of shear keys, the Contractor may roughen the surface as follows. The surface shall be rough, with a minimum amplitude of 6 mm. Acceptable procedures to obtain this rough surface are as follows:
  - (i) By removing the mortar from between the larger aggregate particles with a water jet and soft brush when the concrete is in a semi-hardened state (greencut).
  - (ii) By first applying a chemical retarder to the surface and then removing the mortar from the larger aggregate particles with a water jet and brush.
- (c) The face of joints shall be cleaned of all laitance and dirt, after which the cementitious grout or an approved bonding agent shall be applied. Forms shall be retightened, and all reinforcing steel shall be thoroughly cleaned at the joint prior to concreting.

#### E30.3.12 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.

#### E30.3.13 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.

#### E30.3.14 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.

E30.3.15 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.

E30.3.16 Anti-Graffiti Coating

- (a) Anti-graffiti coating shall be applied to all planter walls shown on the drawings or identified by the Contract Administrator.
- (b) The anti-graffiti coating shall be applied according to manufactures specifications.
- (c) Maintain anti-graffiti coating on all vertical concrete surfaces for a period of two (2) years.

E30.3.17 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.

E30.3.18 Drilling Anchor Rods

- (a) The anchor rods shall be aligned with a steel template to match the steel plates/angles 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.

E30.3.19 Quality Control

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

E30.4 Measurement and Payment

- E30.4.1 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 "Supply and Install CIP Reinforced Concrete Pile for Pedestrian Light (including excavation, anchor rods and conduit for electrical)". 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.

**E30.4.2 Construction of Cast-in-Place Concrete**

- (a) Construction of cast-in-place concrete will be measured on a lump sum basis and will be paid for at the Contract Price per unit for the "Items of Work" listed here below for Cast-in-Place Concrete constructed in accordance with this Specification and accepted by the Contract Administrator.

**Items of Work:**

- (i) Supply and Install #113 Market Avenue CIP Stairs c/w Landing (incl. Footings, and Base Course)
- (ii) Supply and Install Bertha Street Walkway @ John Hirsch Place CIP Stairs (incl. Base Course)
- (iii) Supply and Install Bertha Street Walkway @ John Hirsch Place CIP Ramp c/w Adjacent Retaining Walls (incl. Footings, and Base Course)
- (iv) Supply and Install Bertha Street Walkway CIP Window Wells (incl. Footings, and Connection to Existing Drainage Pipe)
- (v) Supply and Install John Hirsch Place Walkway CIP Retaining Wall (incl. Footings, and Base Course)
- (vi) Supply and Install John Hirsch Place CIP Stairs (incl. Base Course)