



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 34-2010

**SOUTHWEST RAPID TRANSIT CORRIDOR – STAGE 1: TRANSITWAY
CONSTRUCTION, LANDSCAPING & ASSOCIATED WORKS**

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

- B1.1 SOUTHWEST RAPID TRANSIT CORRIDOR – STAGE 1: TRANSITWAY CONSTRUCTION, LANDSCAPING & ASSOCIATED WORKS

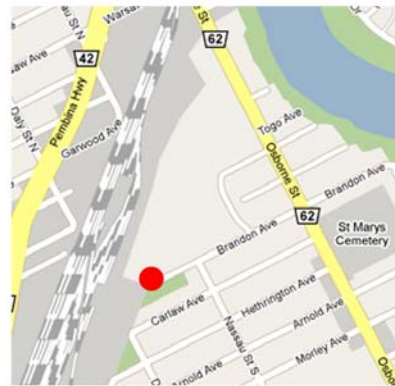
B2. SUBMISSION DEADLINE

- B2.1 The Submission Deadline is 12:00 noon Winnipeg time, April 22, 2010.
- B2.2 Bids determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.
- B2.3 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. SITE INVESTIGATION

- B3.1 Further to C3.1, the Contract Administrator or an authorized representative will be available at the west end of Brandon Avenue, (1 block west of Nassau Street South) at 10:00 am on April 12, 2010 to provide Bidders access to the Site. Attendance is strongly recommended.

- B3.2 The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.



B4. ENQUIRIES

- B4.1 All enquiries shall be directed to the Contract Administrator identified in D3.1.
- B4.2 If the Bidder finds errors, discrepancies or omissions in the Bid Opportunity, or is unsure of the meaning or intent of any provision therein, the Bidder shall notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least five (5) Business Days prior to the Submission Deadline.
- B4.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator to all Bidders by issuing an addendum.
- B4.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator only to the Bidder who made the enquiry.
- B4.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B4 unless that response or interpretation is provided by the Contract Administrator in writing.

B5. 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 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 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, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he 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 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 own name, his 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 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 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 own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.
- B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B9. PRICES

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.1.1 For the convenience of Bidders, and pursuant to B7.4.2 and B15.4.3, 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 Prices from Non-Resident Bidders are subject to a Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

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 valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association or by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or
- (b) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt>)

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 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 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 Bid after the Submission Deadline but before his 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 Bid or in other information required to be submitted, that he 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 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

- B15.4.2 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.
- B15.4.3 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 Bid upon written request to the Contract Administrator.
- B16.4 It should be noted that the D2.1 b) i) of the Work will be contingent upon finalizing the acquisition of the land, funding availability, or other potential issues that could arise. If land acquisition, funding availability or other issues for the Work described in D2.1 b) i) forces the Work to not be approved, the City shall have the right to eliminate the D2.1 b) i) Work.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

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

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

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

- (a) Transitway Construction
 - (i) Jubilee Avenue to Brandon Avenue STA: 9+850 to STA: 11+350
 - (ii) Brandon Avenue to Warsaw Avenue STA: 11+350 to STA: 12+070 (2011 Works)
- (b) Pavement Construction
 - (i) Morley Avenue Extension to Fort Rouge Station
 - (ii) Transit Facility Access to Transitway
 - (iii) Transit Facility Parking Lot
 - (iv) Via Rail Facility Parking Lot
 - (v) Pumping Station Parking Lot
- (c) Active Transportation Pathway
 - (i) Jubilee Avenue to Brandon Avenue STA: 9+850 to STA: 11+350, and work along Brandon Avenue to Woodward Avenue (2011 Works)
 - (ii) ATP connection from Osborne to the South Winnipeg Parkway between 360 and 376 Osborne. (2010 Works)
- (d) Landscaping
 - (i) Jubilee Avenue to Brandon Avenue STA: 9+850 to STA: 11+350, and work along Brandon Avenue to Woodward Avenue (2011 Works)
- (e) Fence installation
 - (i) Between Donald Street and the Transitway from Corydon Avenue to the Harkness Station (2010 Works)
 - (ii) Behind Masonic Temple between the parking lot and the Transitway from the Osborne Station to Corydon Avenue (2011 Works)

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

- (a) Transitway Construction
 - (i) Excavate/Fill as required
 - (ii) Compaction of existing sub-grade
 - (iii) Installation of catchbasins and connection pipe
 - (iv) Installation of subdrains
 - (v) Installation of geotextile
 - (vi) Placement of sub-base and base course
 - (vii) Construct 230mm concrete pavement (plain-dowelled)
 - (viii) Construction of new concrete traffic barrier and curbs
 - (ix) Installation of fencing
- (b) Pavement Construction
 - (i) Excavate/Fill as required
 - (ii) Compaction of existing sub-grade

- (iii) Installation of catchbasins and connection pipe (D2.1b (i), (ii), (iii))
- (iv) Installation of subdrains (D2.1b (i), (ii), (iii))
- (v) Installation of geotextile
- (vi) Placement of sub-base and base course
- (vii) Construct 230mm concrete pavement (plain-dowelled) (D2.1b (i) & (ii))
- (viii) Placement of asphalt pavement (D2.1b (iii) & (iv))
- (ix) Placement of asphalt pavement (D2.1b (v)) in 2011
- (x) Construction of new concrete curbs and sidewalks
- (xi) Installation of electrical works (D2.1 b (iii) & (iv))
- (xii) Boulevard restoration
- (c) Active Transportation Pathway
 - (i) Excavate/Fill as required
 - (ii) Compaction of existing sub-grade
 - (iii) Installation of geotextile
 - (iv) Placement of sub-base and base course
 - (v) Placement of asphalt pavement
- (d) Landscaping
 - (i) Installation of native grasses
 - (ii) Placement of plant material
 - (iii) Electrical
 - (iv) Installation of site furniture
- (e) Fence Installation
 - (i) Install aluminum fence on the top of the concrete barrier separating the ATP on the east side of Donald Street and the Transitway

D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) "**Contract #1**" means the Southwest Rapid Transit Corridor – Stage 1: Land Drainage Construction & Associated Works;
- (b) "**Contract #2**" means the Southwest Rapid Transit Corridor – Stage 1: Land Drainage Pumping Station & Associated Works;
- (c) "**Contract #3**" means the Southwest Rapid Transit Corridor – Stage 1: Transitway Construction, Donald/Harkness Reconstruction & Associated Works;
- (d) "**Contract #4**" means the Southwest Rapid Transit Corridor – Stage 1: Transitway Tunnel at CN Rivers Subdivision Mileage 1.38 & Associated Works;
- (e) "**Contract #5**" means the Southwest Rapid Transit Corridor – Stage 1: Osborne Station & Associated Works;
- (f) "**Contract #6**" means the Southwest Rapid Transit Corridor – Stage 1: Transitway Construction, Landscaping & Associated Works;
- (g) "**Contract #7**" means the Southwest Rapid Transit Corridor – Stage 1: Name to be Determined
- (h) "**Southwest Rapid Transit Corridor – Stage 1**" means the overall project of the Southwest Rapid Transitway Corridor from Queen Elizabeth Way to Jubilee Avenue;
- (i) "**Track Relocation Contract**" means the track relocation detour construction for the Transitway Tunnel at CN Rivers Subdivision.

D4. CONTRACT ADMINISTRATOR

D4.1 The Contract Administrator is Dillon Consulting Limited, represented by:

Taran J. Peters P.Eng.
Contract Administrator
Suite 200-895 Waverley Street
Winnipeg, Manitoba R3T 5P4

Telephone No. (204) 453-2301
Facsimile No. (204) 452-4412

D4.2 At the pre-construction meeting, Taran J. Peters P.Eng. will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D5. CONTRACTOR'S SUPERVISOR

D5.1 At the pre-construction meeting, the Contractor shall identify his 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. NOTICES

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

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

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

The City of Winnipeg
Chief Financial Officer
Administration Building, 3rd Floor
510 Main Street
Winnipeg MB R3B 1B9

Facsimile No.: (204) 949-1174

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

The City of Winnipeg
Internal Services Department
Legal Services Division
Attn: City Solicitor
185 King Street, 3rd Floor
Winnipeg MB R3B 1J1

Facsimile No.: (204) 947-9155

D7. FURNISHING OF DOCUMENTS

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

SUBMISSIONS

D8. AUTHORITY TO CARRY ON BUSINESS

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

D9. SAFE WORK PLAN

- D9.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D9.2 The Safe Work Plan shall be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/safety/default.stm>
- D9.3 The Safe Work Plan shall include information on maintaining a safe work environment during road construction within the tunnel, including, but not limited to, ventilation, lighting, and fire protection. See E50 for additional information.

D10. INSURANCE

- D10.1 The City shall provide and maintain the following Project Insurance Coverages:
- (a) Builder's Risk Insurance in the amount of one hundred percent (100%) of the total project cost.
 - (b) Wrap-Up Liability Insurance in an amount of no less than 10 million dollars (\$10,000,000.00).
- D10.2 Further to D10.1(a) and D10.1(b), the following shall apply:
- (i) The Contractor shall be responsible for deductibles up to \$50,000.00 maximum of any one loss.
 - (ii) The City of Winnipeg will carry such insurance to cover all parties engaged in the Work in this Contract. Provision of this insurance by the City of Winnipeg is not intended in any way to relieve the Contractor from his obligations under the terms of the Contract. Specifically, losses relating to deductibles for insurance, as well as losses in excess of limits of coverage and any risk of loss that is not covered under the terms of the insurance provided by the City of Winnipeg remains with the Contractor;
 - (iii) Wrap-Up Liability insurance shall be maintained from the date of commencement of the Work until one year from the date of Substantial Performance of the Work, after which, if Total Performance has not been met, the responsibility for payment of further insurance premiums shall transfer to the Contractor. The City may reduce any payment to the Contractor by the amount of such further insurance premiums;
 - (iv) Liability coverage shall be provided for completed operations hazards from the date of Substantial Performance of the Work, as set out in the certificate of Substantial

Performance of the Work, on an ongoing basis for a period of six (6) years following Substantial Performance of the Work.

D10.3 Responsibilities of the Contractor:

- (a) The Contractor shall provide and maintain automobile liability insurance for owned and non-owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00);
- (b) The Contractor is responsible for insuring equipment and tools used on the Project that may be owned, rented, leased or borrowed.

D10.4 Further to D10.3(a) and D10.3(b), the following shall apply:

- (i) Premiums and deductibles shall be borne by the Contractor;
- (ii) Policies shall be taken out with insurers licensed to and carrying on business in the Province of Manitoba;
- (iii) The Contractor shall not cancel, or cause any such policy or policies to lapse without a minimum thirty (30) days prior written notice to the City;
- (iv) The Contractor shall provide written notice to the City of Winnipeg of any material changes to their policies within thirty (30) days of the change taking effect;
- (v) The Contractor shall provide the Contract Administrator with evidence of insurance at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of Contract and said insurance shall be in the form of a Certificate of Insurance and shall be in a form satisfactory to the City Solicitor.

D10.5 Responsibilities of Others, including payment of premiums and deductibles:

- (a) All Subcontractors, Consultants and Sub-consultants engaged for the Project are responsible to provide and maintain Automobile liability insurance for owned and non-owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00);
- (b) All Subcontractors, Consultants and Sub-consultants engaged for the Project are responsible for insuring equipment and tools used on the Project that may be owned, rented, leased or borrowed.

D11. PERFORMANCE SECURITY

D11.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:

- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
- (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
- (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.

D11.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D11.2 If the Bid security provided in his 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.

D12. SUBCONTRACTOR LIST

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

D13. EQUIPMENT LIST

D13.1 The Contractor shall provide the Contract Administrator with a complete list of the equipment which the Contractor proposes to utilize (Form K: Equipment List) at or prior to a pre-construction meeting, or at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the C4.1 for the return of the executed Contract.

D14. DETAILED WORK SCHEDULE

D14.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least 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 If, prior to submitting the Detailed Work Schedule, the Contractor does not receive notification pursuant to D16.4 that all or some portion of D2.1 b) i) of the Work may be commenced, he shall complete the Detailed Work Schedule for all of the Work except D2.1 b) i) assuming that, if all of D2.1 b) i) is eliminated, the time periods stipulated in D201 for Substantial Performance of the Work and in D222 for Total Performance of the Work will not change.

D14.3 If, after submitting the Detailed Work Schedule, the Contractor receives notification that all or any portion of D2.1 b) i) of the Work may be commenced, he shall submit a revised Detailed Work Schedule no later than two (2) Business Days from receipt of the notification.

D14.4 The Detailed Work Schedule shall be provided in Gantt chart format and shall include all major tasks and milestones specified for the Work acceptable to the Contract Administrator.

D14.5 An update to the Detailed Work Schedule to reflect actual progress and monitor scheduled progress will be required, at a minimum, prior to the start of the 2011 construction season, but may be required as often as every two (2) months if the Contract Administrator deems it necessary.

D14.6 Within the Detailed Work Schedule discussed above, the following information needs to be brought to the attention of the Contractor in order to provide an accurate schedule:

(a) The Substantial and Total Performance of Contract #4: Southwest Rapid Transit Corridor – Stage 1: Transitway Tunnel at CN Rivers Subdivision Mileage 1.38 & Associated Works is listed as September 15, 2011 and September 30, 2011 respectfully. It is the intention that this work will be completed by these dates listed within its Bid Opportunity.

(b) As stated within this Bid Opportunity in D18, the work outlined in D2.1 a) ii) may only start in 2011. It is also noted that the work within the Contract #4 Tunnel limits may only start after the completion of the Substantial Performance of Contract #4 as discussed in D13.4 (a).

D14.7 Further to D14.4, the Gantt chart shall clearly identify the start and completion dates of all activities/tasks making up the Work. The Gantt chart shall show the time on a weekly basis, required to carry out the Work. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

D15. ENVIRONMENTAL PROTECTION PLAN

- D15.1 Prior to commencing construction activities or delivery of materials to Site, submit an Environmental Protection Plan for review and approval by Contract Administrator. The Environmental Protection Plan shall present a comprehensive plan to address known or potential environmental issues which may be present during construction. Where applicable, the Environmental Protection Plan shall include Subcontractor activities. The submission of the Environmental Protection Plan to the Contract Administrator shall in no way relieve the Contractor of full responsibility for the success or failure of all environmental management practices and procedures.
- D15.2 The Environmental Protection Plan shall address the following:
- (a) Name[s] of person[s] responsible for ensuring adherence to Environmental Protection Plan.
 - (b) Name[s] and qualifications of person[s] responsible for manifesting hazardous waste to be removed from Site.
 - (c) Name[s] and qualifications of person[s] responsible for training Site personnel.
 - (d) Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
 - (e) Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features including vegetation to be preserved within authorized Work areas.
 - (f) Environmental Emergency Response: including procedures, instructions, and reporting in the event of unforeseen spill of regulated substance.
 - (g) Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - (h) Hazardous materials and waste management plan outlining storage, transportation and disposal.
 - (i) Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project Site.
 - (j) Contaminant prevention plan that: identifies potentially hazardous substances to be used on job Site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
 - (k) Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete wash or curing water, clean-up water, dewatering of ground water, hydrostatic test water, and water used in flushing of lines.
 - (l) Monitor and report to ensure implementation of environmental protection measures.
- D15.3 Fires
- (a) Fires and burning rubbish or waste materials on Site is not permitted.
- D15.4 Disposal of Waste
- (a) Dispose all waste at licensed facilities or with licensed haulers.
 - (b) The top 1.0 m of Site overburden is not to be removed from Site and is to be stockpiled along the Transitway roadway, East Boulevard, South of Brandon Avenue.
 - (c) All waste disposal grounds receiving debris and construction waste from this project must be operated under the authority of a valid permit issued pursuant to MR 150 (latest edition) Waste Disposal Grounds Regulation under the Environment Act.

- (d) Dispose of all sewage and seepage from the on-site sanitary facilities in accordance with the Onsite Wastewater Management Systems Regulation MR 83/2003.
- (e) Do not bury waste materials on Site.
- (f) Do not dispose of solid or liquid wastes in drains or waterways.

D15.5 Hazardous Waste

D15.5.1 Definitions

- (a) Dangerous Goods: product, substance, or organism that is specifically listed or meets hazard criteria established in the Dangerous Goods Handling and Transportation Act or regulations including hazardous materials and wastes.
- (b) Hazardous Material: product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
- (c) Hazardous Waste: any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.
- (d) Workplace Hazardous Materials Information System (WHMIS): a Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

D15.5.2 Materials Management

- (a) Only bring on Site quantity of hazardous materials required to perform Work.
- (b) Maintain MSDSs in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.
- (c) Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

D15.5.3 Storage and Handling

- (a) Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
 - (i) Sign storage areas.
 - (ii) Store and handle flammable and combustible materials in accordance with current Manitoba and National Fire Code of Canada requirements.
 - (iii) Do not transfer of flammable and combustible liquids in vicinity of open flames or heat-producing devices.
 - (iv) Do not use flammable liquids having flash point below 38 degrees C, such as naphtha or gasoline as solvents or cleaning agents.
 - (v) Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
 - (vi) Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
- (b) Keep no more than 100 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
 - (i) Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
 - (ii) Storage of quantities of flammable and combustible liquids exceeding 100 litres for Work purposes requires the written approval of the Contract Administrator
 - (iii) Fuel storage exceeding 100L shall be a minimum distance of 100 metres from any water body and in compliance with the requirements of the Storage and

Handling of Petroleum Products and Allied Products Manitoba Regulation
188/2001 of the Dangerous Goods Handling and Transportation Act.

- (c) Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
 - (i) Store hazardous materials and wastes in closed and sealed containers.
 - (ii) Label containers of hazardous materials and wastes in accordance with WHMIS.
 - (iii) Store hazardous materials and wastes in containers compatible with that material or waste.
 - (iv) Segregate incompatible materials and wastes. Ensure that different hazardous materials or hazardous wastes are not mixed.
 - (v) Store hazardous materials and wastes in secure storage area with controlled access.
 - (vi) Maintain clear egress from storage area.
 - (vii) Store hazardous materials and wastes in location that will prevent them from spilling into environment.
 - (viii) Store products on spill trays or berms with 110% capacity.
 - (ix) Do not store within 30 meters of a waterway or drain
 - (x) Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
 - (xi) Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began and disposal occurred. Maintain tipping and other disposal receipts.
- (d) Report spills or accidents immediately:
 - (i) to the Contract Administrator.
 - (ii) to Manitoba Conservation Accident Reporting Line at 204-944-4888 in accordance with Manitoba Regulation 439/87 of the Dangerous Goods and Transportation Act.
 - (iii) Submit a written spill report to the Contract Administrator outlining cause and proposed corrective action and Manitoba Conservation as required. Provide copies of reports submitted to Manitoba Conservation to the Contract Administrator.

D15.5.4 Transportation

- (a) Transport hazardous materials and wastes in accordance with the Manitoba Dangerous Goods Handling and Transportation Act.
 - (i) Ensure that trained personnel handle, offer for transport, or transport dangerous goods.
 - (ii) Use licensed carrier authorized by provincial authorities to accept subject material.
 - (iii) Label container[s] with legible, visible safety marks as prescribed by federal and provincial regulations.
 - (iv) Provide photocopy of shipping documents and waste manifests to the Contract Administrator.
 - (v) Track receipt of completed manifest from consignee after shipping dangerous goods. Provide a photocopy of completed manifest to the Contract Administrator.
 - (vi) Report discharge, emission, or escape of hazardous materials immediately to the Contract Administrator and appropriate provincial authority. Take measures to control release.

D15.5.5 Disposal

- (a) Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
 - (i) Recycle hazardous wastes for which there is approved, cost effective recycling process available.
 - (ii) Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
 - (iii) Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
 - (iv) Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

D15.5.6 Erosion and Sediment Control

- (a) Develop an erosion control plan to control negative impacts on water and air quality; plan should meet these objectives:
 - (i) Prevent loss of soil during construction by storm water run-off and wind erosion.
 - (ii) Protect against erosion from stockpiled topsoil aggregates.
 - (iii) Prevent sedimentation of the land drainage system and receiving streams with dust, particulate matter or eroded sediment.
- (b) Supply, install, maintain and remove (as applicable and when no longer required) effective sediment control barriers and erosion control before starting Work that may result in the deposit of sediment into a ditch or water body to avoid potential impacts to fish and fish habitat.
 - (i) Erosion and sediment control measures and installations include, as required, silt socks around storm drains, silt fence barriers, erosion control blanket, straw wattles, and geotextile fabric as appropriate.
 - (ii) Routinely inspect all erosion and sediment control measures and installations and immediately repair any deficiencies.

D15.5.7 Work to Adjacent Waterways

- (a) Do not operate construction equipment in waterways and, where possible, avoid operating equipment within 30 meters of the waterway.
- (b) Do not use waterway beds for borrow material.
- (c) Do not dump excavated fill, waste material or debris in ditches or waterway.
- (d) Design and construct temporary crossings to minimize erosion to waterways.
- (e) Dispose of excavated materials above the high water mark and 30 meters way from a watercourse.

D15.5.8 Drainage

- (a) Provide temporary drainage and pumping as necessary to keep excavations and Site free from water.
- (b) Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- (c) Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

D15.5.9 Reducing Site Disturbances

- (a) Do not disturb, in any way, the embankment slopes, roadway shoulders, and adjacent ground surfaces areas outside the limits of the construction areas including the approved lay down, staging and access unless written permission has been obtained from the Contract Administrator. Such written permission will be granted only if it can be shown that there is no alternative.
- (b) Minimize disturbance of any undeveloped areas on Site and maintain existing Site grading where indicated and where possible.

- (i) Minimize stripping of topsoil and vegetation
- (ii) Re-grade and plant vegetation on construction Site as soon as possible.
- (iii) Avoid soil compaction where possible.

D15.5.10 Pollution Control

- (a) Maintain temporary erosion and pollution control features installed under this Contract.
- (b) Maintain construction equipment in good working order. Control emissions from equipment.
- (c) Cover or wet down dry materials and stockpiled soils to prevent blowing dust and debris. Provide dust control for the construction Site, temporary and access roads.
- (d) Bring only clean fill, granular, rip rap and other similar construction materials to the project Site.

D15.5.11 Noise

- (a) Noise-generating activities shall be limited to the hours indicated in the City of Winnipeg Noise By-law, unless otherwise accepted in advance by the Contract Administrator.
- (b) The Contractor shall be responsible for scheduling Work to avoid potential noise problems and/or employ noise reduction measures to reduce noise to acceptable limits. The Contractor shall also demonstrate to the Contract Administrator that Works to be performed during the night-time period, on Sundays, and Holidays, should approval be given to work during these times, shall not exceed the approved limit.

D15.5.12 Dust and Particulate Control

- (a) Dust control practices implemented by the Contractor during construction shall include regular street cleaning and dampening of construction access roads and Work areas with water or approved chemicals at an adequate frequency to prevent the creation of dust.
- (b) Only water or chemicals approved by the Contract Administrator shall be used for dust control. The use of waste petroleum or petroleum by-products is not permitted.
- (c) The Contractor shall ensure that trucks which are used to haul excavated material and backfill material to and from the Site utilize tarpaulin covers during transport to prevent material from falling onto the street and creating dust.

SCHEDULE OF WORK

D16. COMMENCEMENT

D16.1 The Contractor shall not commence any Work until he is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.

D16.2 The Contractor shall not commence any Work on the Site until:

- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D8;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the twenty-four (24) hour emergency response phone number specified in D5.2.
 - (iv) the Safe Work Plan specified in D9;
 - (v) evidence of the insurance specified in D10;
 - (vi) the performance security specified in D11;
 - (vii) the Subcontractor list specified in D12;

- (viii) the equipment list specified in D13;
 - (ix) the detailed work schedule specified in D14.
 - (x) the Environmental Protection Plan specified in D15.
 - (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.
 - (c) the Contractor has provided proof of CN Contractor Safety Training for each individual proposed to Work on the Site. Contractor to contact Christina Cusson at (204) 231-7805 for CN for Right of Entry and Safety Training requirements.
 - (d) The Contractor has attended a Transit safety meeting to be arranged with Tony Dreolini at (204) 986-5574.
- D16.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.
- D16.4 The Contractor shall not commence D2.1 b) i) of the Work as described in D2 and identified in Form B: Prices, unless he has received notification from the Contract Administrator that the City has received notice that construction can proceed.
- D16.5 The City intends to award this Contract after the City Council meeting that is to be held on June 1, 2010.
- D16.5.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance may be adjusted by the difference between the aforementioned intended and actual dates if the Contract Administrator deems it necessary based on the length of the delay.
- D16.5.2 If, for some reason, the Contract is awarded prior to the June 1, 2010 City Council meeting, the Contractor shall commence Work as per D15.3 and no sooner than May 10, 2010.

D17. RESTRICTED WORK HOURS

- D17.1 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.

D18. WORK BY OTHERS

- D18.1 Work by others on or near the Site will include but not necessarily be limited to:
- (a) Manitoba Hydro:
 - (i) Street Lighting: Miscellaneous lighting pole removal and street light pole installation will be taking place throughout the limits of this Contract.
 - (ii) Electric: Miscellaneous Hydro works will be taking place throughout the project such as adjustments of manholes or other appurtenances like pedestals, etc.
 - (iii) Gas: Gas lines may require lowering or rock wrapping depending on their location, depth, and size of pipe. This work should be coordinated prior to and immediately after excavation has taken place.
 - (b) VIA RAIL:
 - (i) VIA Rail will be removing Track 12 in order to make room for the construction of the new VIA Rail parking lot described in D2.1 b) iv) within this Contract. This work is expected to be completed by July 2010. It should be noted that VIA Rail is currently working on the approval of the Work on their site from within their organization. This approval will need to be obtained prior to the Work in D2.1 b) iv) commencing.
 - (c) MTS:
 - (i) Miscellaneous adjustments of manholes and relocation of MTS boxes and other appurtenances may be required within this Contract.

- (d) Contract #3 – Southwest Rapid Transit Corridor – Stage 1: Transitway Construction, Donald/Harkness Reconstruction & Associated Works:
 - (i) The Contractor for Contract #3, Nelson River Construction, will be constructing the transitway, concrete barrier, and ATP along Donald Street and Harkness which will be Substantially Performed by October 1, 2010. Coordination will be required for the installation of the aluminum fence along the barrier.
- (e) Contract #4 – Southwest Rapid Transit Corridor – Stage 1: Transitway Tunnel at CN Rivers Subdivision Mileage 1.38 & Associated Works:
 - (i) The Contractor for Contract #4, Surespan, will be constructing the north half of the tunnel in 2010, and then proceeding to the south half of the tunnel at the end of 2010 with completion in 2011. During the construction of the south half of the tunnel, Surespan will be accessing their site via Brandon Avenue and traveling through the Contract #6 Site north to the tunnel. They will also be utilizing space around the tunnel to the south as a staging area. Access must be provided to them at all times and coordination of construction vehicles will need to take place to accommodate movement of large pieces of equipment, or high volumes of construction vehicles supplying material, should this be required.
- (f) Track Relocation Contract:
 - (i) As part of the Contract #4 works, the tracks for the CN Rail line will be required to be relocated, once at the completion of the north half of the tunnel, and once at the completion of the south half of the tunnel. This work will take place in CN lands, but access may be required thru the Contract #6 Site for workers to get to the track relocation.
- (g) Contract #5 – Southwest Rapid Transit Corridor – Stage 1: Osborne Station & Associated Works:
 - (i) The Contractor for Contract #5, who will be determined upon tendering in the Spring of 2010, will be constructing a bridge structure across Osborne Street starting in 2010 with completion in 2011. During construction, the Contractor for Contract #5 will require access to their site via Warsaw Avenue and will travel adjacent to the Contract #6 north limit. Access must be provided to them at all times and coordination of construction vehicles will need to take place to accommodate movement of equipment, or construction vehicles supplying material, should this be required.
- (h) Contract #7 – Southwest Rapid Transit Corridor – Stage 1: *Name to be Determined*:
 - (i) The Contractor for Contract #7, who will be determined upon tendering in the Spring of 2011, may construct the roadworks on Warsaw Avenue and the back lane from Warsaw Avenue to Jessie Avenue in 2011. This Contractor will also be supplying various bus station appurtenances for the Fort Rouge Station. During the construction and placement of these items for Contract #7, the Contractor for this Contract (#6) shall work together with the Contract #7 Contractor to provide access and mobility to their site as best as possible.
- (i) CN Rail:
 - (i) It is CN's intention to relocate the CN field building and communication tower near Jubilee prior to construction of the Transitway in this area. CN may also, at times, require access to their utility via the transit corridor property. This access shall be accommodated.
- (j) AECOM:
 - (i) AECOM has been retained by the City of Winnipeg to complete a Mill and Fill of Jubilee Avenue and a rehabilitation of the Jubilee overpass in 2010.

D19. SEQUENCE OF WORK

D19.1 Further to C6.1, the sequence of Work shall be as follows:

- D19.1.1 This Contract has been tendered in 2010 to allow the Contractor two construction seasons to complete the Work. Supplemental to the breakdown of Work found in D2, the following detailed breakdown shall be adhered to.
- D19.1.2 Work to be completed in 2010:
- (a) Transitway Construction
 - (i) Earthworks at Jubilee tie ins to transit corridor
 - (b) Fence Installation
 - (i) Between Donald Street and the Transitway from Corydon Avenue to the Harkness Station
- D19.1.3 Work that can be started in 2010:
- (a) Transitway Construction
 - (i) Jubilee Avenue to Brandon Avenue STA: 9+850 to STA: 11+350
 - (b) Pavement Construction
 - (i) Morley Avenue Extension to Fort Rouge Station
 - (ii) Transit Facility Access to Transitway
 - (iii) Transit Facility Parking Lot
 - (iv) Via Rail Facility Parking Lot
 - (v) Pumping Station Parking Lot
 - ◆ All construction works except asphaltting
 - (c) Active Transportation Pathway
 - (i) ATP connection from Osborne to the South Winnipeg Parkway between 360 and 376 Osborne
 - (d) Landscaping
 - (i) Jubilee Avenue to Brandon Avenue STA: 9+850 to STA: 11+350
 - ◆ Berm Excavation and Fill construction
- D19.1.4 Work to be started in 2011:
- (a) Transitway Construction
 - (i) Jubilee tie ins from Jubilee overpass to transit corridor
 - (ii) Brandon Avenue to Warsaw Avenue STA: 11+350 to STA: 12+070
 - ◆ Note that road work within the limits of Contract #4 will only be permitted to start at the completion of Substantial Performance of Contract #4 as per D13.4 and D18.1.4 specified herein.
 - ◆ Work may be permitted on the north half of the tunnel to Warsaw, and on the approach to the south tunnel entrance prior to Contract #4 achieving Substantial Performance, if permitted by the Contract #4 Contractor and the Contract Administrator, but this is not to be assumed nor expected as it will be determined near the completion of Contract #4.
 - (b) Pavement Construction
 - (i) Pumping Station Parking Lot
 - ◆ Asphaltting
 - (c) Active Transportation Pathway
 - (i) Jubilee Avenue to Brandon Avenue STA: 9+850 to STA: 11+350, and work along Brandon Avenue to Woodward Avenue
 - (d) Landscaping
 - (i) Jubilee Avenue to Brandon Avenue STA: 9+850 to STA: 11+350, and work along Brandon Avenue to Woodward Avenue
 - (e) Fence Installation

- (i) Behind Masonic Temple between the parking lot and the Transitway from the Osborne Station to Corydon Avenue (2011 Works)
 - ◆ Note that fence installation on the barrier within the limits of Contract #3 will only be permitted to start at the completion of Substantial Performance of Contract #3 as per D17.1 d) i) and specified herein.
 - ◆ Work may be permitted prior to the Substantial Performance of Contract #3, if permitted by the Contract #3 Contractor and the Contract Administrator, but this is not to be assumed nor expected as it will be determined near the completion of Contract #3.

D20. CRITICAL STAGES

- D20.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:
- (a) Critical Stage 1: Total Performance of Work listed in D2.1 c) ii) must be obtained within 40 Calendar Days from the commencement of the project.
 - (b) Critical Stage 2: Substantial Performance of the Fort Rouge Station concrete Work from 10+850 to 11+000, the Fort Rouge Station, and Fort Rouge Parking Lane must be obtained by July 15, 2011 to allow time for the Contract #7 Work discussed in D17.1 g) i) to take place.
 - (c) Critical Stage 3: Substantial Performance of Work listed in D2.1 e) i) must be obtained by December 31, 2010.
- D20.2 When the Contractor considers the Work associated with each Critical Stage to be completed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Completion. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D20.3 The date on which each Critical Stage Work has been accepted by the Contract Administrator as being completed to the requirements of the Contract is the date on which completion of each Critical Stage has been achieved.

D21. SUBSTANTIAL PERFORMANCE

- D21.1 The Contractor shall achieve Substantial Performance by October 15, 2011.
- D21.2 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.
- D21.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.
- D21.4 The dates for Substantial Performance will not be altered, depending on if the Work for D2.1 b) i) is included or removed from this project.

D22. TOTAL PERFORMANCE

- D22.1 The Contractor shall achieve Total Performance by October 29, 2011.
- D22.2 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.

- D22.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.
- D22.4 The dates for Total Performance will not be altered, depending on if the Work for D2.1 b) i) is included or removed from this project.

D23. LIQUIDATED DAMAGES

- D23.1 If the Contractor fails to complete the Critical Stage 1 Works on or before 40 Calendar Days after the commencement of the project, the Contractor shall pay the City one thousand five hundred dollars (\$1,500) per Calendar Day for each and every Calendar Day following that date during which such failure continues.
- D23.2 If the Contractor fails to complete the Critical Stage 2 Works on or before July 15, 2011, the Contractor shall pay the City two thousand five hundred dollars (\$2,500) per Calendar Day for each and every Calendar Day following that date during which such failure continues.
- D23.3 If the Contractor fails to complete the Critical Stage 3 Works on or before December 31, 2010, the Contractor shall pay the City one thousand five hundred dollars (\$1,500) per Calendar Day for each and every Calendar Day following that date during which such failure continues.
- D23.4 If the Contractor fails to achieve Total Performance in accordance with the Contract by the day fixed herein for Total Performance, the Contractor shall pay the City ten thousand dollars (\$10,000) per Calendar Day for each and every Calendar Day following the day fixed herein for Total Performance during which such failure continues.
- D23.5 The amount specified for liquidated damages in D23.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Total Performance by the day fixed herein for same.
- D23.6 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D24. SCHEDULED MAINTENANCE

- D24.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:
- (a) Reflective Crack Maintenance (during warranty period) as specified in CW 3250;
 - (b) Sodding (maintenance period) as specified in CW 3510;
 - (c) Landscaping as specified within this specification..
- D24.2 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

D25. JOB MEETINGS

- D25.1 Regular weekly job meetings will be held at the field office. 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.

D25.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

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

D26.1 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).

WARRANTY

D27. WARRANTY

D27.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire two (2) years after the Grand Opening date of the Southwest Rapid Transit Corridor Stage 1 unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

FORM H1: PERFORMANCE BOND
(See D11)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$ _____ . _____)

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

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

BID OPPORTUNITY NO. 34-2010

SOUTHWEST RAPID TRANSIT CORRIDOR – STAGE 1: TRANSITWAY CONSTRUCTION,
LANDSCAPING & ASSOCIATED WORKS

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

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

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

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

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

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

_____ day of _____, 20____ .

SIGNED AND SEALED
in the presence of:

(Witness as to Principal if no seal)

(Name of Principal)

Per: _____ (Seal)

Per: _____

(Name of Surety)

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

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 (1993 Revision), International Chamber of Commerce Publication Number 500.

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM J: SUBCONTRACTOR LIST
(See D12)

SOUTHWEST RAPID TRANSIT CORRIDOR – STAGE 1: TRANSITWAY CONSTRUCTION,
LANDSCAPING & ASSOCIATED WORKS

<u>Portion of the Work</u>	<u>Name</u>	<u>Address</u>
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Supply of Materials:

Concrete		
Asphalt		
Base Course and Sub-Base		
Landscaping/Plant Material		
Fencing		
Underground Works		
Electrical		
Other		

Installation/Placement:

Concrete		
Asphalt		
Base Course and Sub-Base		
Landscaping/Plant Material		
Fencing		
Underground Works		
Electrical		
Other		

FORM K: EQUIPMENT
(See D13)

**SOUTHWEST RAPID TRANSIT CORRIDOR – STAGE 1: TRANSITWAY CONSTRUCTION,
LANDSCAPING & ASSOCIATED WORKS**

<p>1. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>2. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>3. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>

FORM K: EQUIPMENT
(See D13)

**SOUTHWEST RAPID TRANSIT CORRIDOR – STAGE 1: TRANSITWAY CONSTRUCTION,
LANDSCAPING & ASSOCIATED WORKS**

<p>4. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>5. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>
<p>6. Category/type:</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p> <p>Make/Model/Year: _____ Serial No.: _____</p> <p>Registered owner: _____</p>

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

E1.1 These Specifications shall apply to the Work.

E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.

E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/Spec/Default.stm>

E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.

E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.

E1.3 The following are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
P-3317-01	Cover Sheet	A1
P-3317-02	Drawing List	A1
P-3317-03	Legend	A1
P-3317-04	General Arrangement	A1
P-3317-05	Transitway Removals (1 of 6)	A1
P-3317-06	Transitway Removals (2 of 6)	A1
P-3317-07	Transitway Removals (3 of 6)	A1
P-3317-08	Transitway Removals (4 of 6)	A1
P-3317-09	Transitway Removals (5 of 6)	A1
P-3317-10	Transitway Removals (6 of 6)	A1
P-3317-11	Horiz. Geometry – STA 9+915 to 10+075 & Jubilee Ave.	A1
P-3317-12	Horiz. Geometry – STA 10+075 to 11+125	A1
P-3317-13	Horiz. Geometry – Fort Rouge Station and Morley Avenue	A1
P-3317-14	Horiz. Geometry – STA 11+125 to 11+850	A1

<u>Drawing No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
P-3317-15	Horiz. Geometry – Transit Entrance & Service Road	A1
P-3317-16	Horiz. Geometry – STA 11+850 to 12+070 & QEW	A1
P-3317-17	Paving & Grading – Jubilee Connection – Plan	A1
P-3317-18	Paving & Grading – Northbound Jubilee Connection (Profile)	A1
P-3317-19	Paving & Grading – Southbound Jubilee Connection (Profile)	A1
P-3317-20	Paving & Grading – Transitway – STA 9+850 to 10+045	A1
P-3317-21	Paving & Grading – Transitway – STA 10+045 to 10+195	A1
P-3317-22	Paving & Grading – Transitway – STA 10+195 to 10+330	A1
P-3317-23	Paving & Grading – Transitway – STA 10+330 to 10+500	A1
P-3317-24	Paving & Grading – Transitway – STA 10+500 to 10+665	A1
P-3317-25	Paving & Grading – Transitway – STA 10+665 to 10+800	A1
P-3317-26	Paving & Grading – Transitway – STA 10+800 to 10+950	A1
P-3317-27	Paving & Grading – Transitway – STA 10+950 to 11+110	A1
P-3317-28	Paving & Grading – Transitway – STA 11+110 to 11+250	A1
P-3317-29	Paving & Grading – Transitway – STA 11+250 to 11+375	A1
P-3317-30	Paving & Grading – Transitway – STA 11+375 to 11+520	A1
P-3317-31	Paving & Grading – Transitway – STA 11+520 to 11+715 (Plan)	A1
P-3317-32	Paving & Grading – Transitway – STA 11+520 to 11+715 (Profile)	A1
P-3317-33	Paving & Grading – Transitway – STA 11+715 to 11+905 (Plan)	A1
P-3317-34	Paving & Grading – Transitway – STA 11+715 to 11+905 (Profile)	A1
P-3317-35	Paving & Grading – Transitway – STA 11+905 to 12+100 (Plan)	A1
P-3317-36	Paving & Grading – Transitway – STA 11+905 to 12+100 (Profile)	A1
P-3317-37	Paving & Grading – Transitway – STA 12+100 to 12+225	A1

<u>Drawing No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
P-3317-38	Paving & Grading – Fort Rouge Station 1	A1
P-3317-39	Paving & Grading – Fort Rouge Station 2	A1
P-3317-40	Paving & Grading – Fort Rouge Station Parking Lane	A1
P-3317-41	Paving & Grading – Transit Base Entrance	A1
P-3317-42	Paving & Grading – Transit Base Service Road	A1
P-3317-43	Paving & Grading – Transit Base Parking Lot	A1
P-3317-44	LDS – Fort Rouge Station	A1
P-3317-45	Cross Sections – Jubilee Connection	A1
P-3317-46	Cross Sections – 9+915 & 10+010	A1
P-3317-47	Cross Sections – 10+420 to 10+980 & Fort Rouge Station	A1
P-3317-48	Cross Sections – 11+030 to 11+320	A1
P-3317-49	Cross Sections – 11+340 & 11+385	A1
P-3317-50	Cross Sections – 11+445 & Transit Entrance Area	A1
P-3317-51	Cross Sections – 11+630 & 11+705.525	A1
P-3317-52	Cross Sections – 11+720 & 11+740	A1
P-3317-53	Cross Sections – 11+820	A1
P-3317-54	Cross Sections – 12+000 & 12+036	A1
P-3317-55	Transit Base Parking Lot Details	A1
P-3317-56	Curb-Barrier Transitions	A1
P-3317-57	Barrier and Curb Details	A1
P-3317-58	Catch Basin Details (1 of 2)	A1
P-3317-59	Catch Basin Details (2 of 2)	A1
P-3317-60	Guardrails	A1

<u>Drawing No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
P-3317-61	Guardrail Standard Details	A1
P-3317-62	Landscape Works – Transitway 1 of 6	A1
P-3317-63	Landscape Works – Transitway 2 of 6	A1
P-3317-64	Landscape Works – Transitway 3 of 6	A1
P-3317-65	Landscape Works – Transitway 4 of 6	A1
P-3317-66	Landscape Works – Transitway 5 of 6	A1
P-3317-67	Landscape Works – Transitway 6 of 6	A1
P-3317-68	Pathway Works – Brandon and Woodward	A1
P-3317-69	Pathway Works – Osborne Connection and Donald Fence	A1
P-3317-70	Landscape Details	A1
P-3317-71	Landscape Details	A1
P-3317-72	Landscape Details	A1

E2. GEOTECHNICAL REPORT

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

E3. OFFICE FACILITIES

- E3.1 The Contractor shall supply office facilities meeting the following requirements:
- The field office shall be for the exclusive use of the Contract Administrator.
 - The building shall be conveniently located near the Site of the Work.
 - The building shall have a minimum floor area of 25 square metres, a height of 2.4m with four windows for cross ventilation and a door entrance with a suitable lock.
 - The building shall be suitable for all weather use. It shall be equipped with a heater and air conditioner so that the room temperature can be maintained between either 16-18°C or 24-25°C.
 - The building shall be adequately lighted with fluorescent fixtures and have a minimum of five wall outlets.
 - The building shall be equipped with internet hook up.
 - The building shall be furnished with two desks, one drafting table, table 3m X 1.2m, one stool, one four drawer legal size filing cabinet, and a minimum of 8 chairs..

- (h) A portable toilet shall be located near the field office building. The toilet shall be continuously provided with sanitary hand cleaner and have a locking door and be for the exclusive use of the Contract Administrator and other personnel from the City.
- (i) The field office building and the portable toilet shall be cleaned on a weekly basis immediately prior to each Site meeting. The Contract Administrator may request additional cleaning when he deems it necessary.

- E3.2 The Contractor shall be responsible for all installation and removal costs, all operating costs, and the general maintenance of the office facilities.
- E3.3 The office facilities will be provided from the date of the commencement of the Work to the date of Total Performance.
- E3.4 No separate measurement or payment will be made for "Office Facilities".

E4. PROTECTION OF EXISTING TREES

- E4.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities.
- E4.2 The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of trees.
- E4.3 All trees will have a protective zone at the dripline of the crown, which will remain free of digging, trenching, grade changes, stock piling of materials and soil compaction, throughout the duration of the Contract. Protective snow fencing around these areas is required.
- E4.4 Trees within and immediately adjacent to proposed construction areas and those identified to be at risk by the Contract Administrator, will require 25 x 100 x 2400mm wood planks strapped to the tree trunk to completely protect the tree trunk from impact damage. (Smaller trees will be similarly protected using proportionally sized wood planks.)
- E4.5 Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 3m from the closest edge of the trunk. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation. They must be properly trimmed with sharp tools to prevent crushing or being pulled up by construction equipment. No paint is required. All exposed roots must be mulched until the excavated area is filled with clean earth to avoid exposure to sunlight and desiccation.
- E4.6 Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform the Work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.
- E4.7 Work on-Site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.
- E4.8 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his designate.
- E4.9 Auguring under existing trees will be the only acceptable method of underground installations. Any other excavations must be approved by the Forestry Branch.
- E4.10 Except as required in clause E4.5 and E4.7, Elm trees shall not be pruned at any time between April 1 and July 31.

E4.11 No separate measurement or payment will be made for the protection of trees.

E5. TRAFFIC CONTROL

E5.1 Further to clauses 3.6 and 3.7 of CW 1130-R1:

- (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.

E6. TRAFFIC MANAGEMENT

E6.1 Further to clause 3.7 of CW 1130-R1:

E6.1.1 The Contractor shall take note of the following rules when accessing the construction Site

- (a) Access to the Site will be permitted from Osborne Street via Brandon Avenue.
- (b) Access to the Site will be permitted from Pembina Highway to Jubilee Avenue and then via Lilac Street at Argue Street.
- (c) A permit will be provided by the City for vehicles needing to use Jubilee Avenue with more than 6 tires.
- (d) Access to the Site will not be permitted from Osborne Street to Jubilee Avenue.
- (e) The routes listed above will be the same for leaving the Site.
- (f) The Contractor shall take note that the WB Jubilee to SB Pembina and SB Pembina to EB Jubilee ramps will be closed from May 2010 to September 2010 for construction.

E6.1.2 The Contractor shall maintain access at all times to the VIA Rail Yards from Brandon Avenue.

E6.1.3 The Contractor shall maintain access at all times to the Contract #4 tunnel construction site from Brandon Avenue.

E6.1.4 The Contractor shall maintain access at all times to the Contract #5 Osborne Overpass construction site from Warsaw Avenue.

E6.1.5 The Contractor shall maintain site access for CN Rail traffic at all times.

E6.1.6 Pedestrian and ambulance/emergency vehicle access must be maintained at all times.

E7. WATER OBTAINED FROM THE CITY

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

E8. SURFACE RESTORATIONS

E8.1 Further to clause 3.3 of CW 1130-R1, 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.

E9. SUPPLY AND INSTALL DETECTABLE WARNING SURFACE TILES

DESCRIPTION

E9.1 This specification covers the supply and installation of detectable warning surface tiles in sidewalk ramps and multi-use path ramps.

SPECIFICATIONS AND DRAWINGS

E9.2 Referenced Standard Construction Specifications and Standard Details

- (a) CW 3235 - Renewal of Existing Miscellaneous Concrete Slabs
- (b) CW 3240 - Renewal of Existing Curbs
- (c) CW 3310 - Portland Cement Concrete Pavement Works
- (d) CW 3325 - Portland Cement Concrete Sidewalk
- (e) SD-229C - Curb Ramp for Concrete Pavement
- (f) SD-229D - Curb Ramp for Asphalt Overlay

E9.3 Attached; SDE Drawings and Installation Manual

- (a) SDE-229A - Curb Ramp Layout for Intersections
- (b) SDE-229AA - Detectable Warning Surface in Curb Ramps for Intersections
- (c) SDE-229AB - Curb Ramp Layout for Offset Intersections
- (d) SDE-229BB - Detectable Warning Surface in Curb Ramps for Medians
- (e) SDE-229E - Curb Ramp Depressed Curb
- (f) Manufacturer's Installation Manual – Armor-Tile Cast in Place Inline Dome Detectable/Tactile Warning Surface Tile.

MATERIALS

E9.4 Acceptable products for:

- Sidewalks: 2'x 4' (610 x 1220mm) Armor-Tile Cast in Place (yellow)
- Multi-use paths: 2'x 5' (610 x 1520mm) Armor-Tile Cast in Place (yellow)

E9.5 Available from:

Engineered Plastics Inc.
1400 Cornwall Road Unit 6
Oakville, Ontario L6J 7W5

Attention: Manny Burgio
Ph: 800-682-2525
Fax: 800-769-4463

or

Alsip's Building Products
1 Cole Avenue
Winnipeg, Manitoba

Attention: Jason Alsip
Ph. 204-667-3330

- E9.6 Detectable warning surface tiles shall be Highway Yellow (USA) or Safety Yellow (Canada).
- E9.7 Detectable warning surface tiles shall be cast in place type.
- E9.8 Truncated domes on detectable warning surface tiles shall be in accordance with ADA Accessibility Guidelines (ADAAG).

CONSTRUCTION METHODS

E9.9 General

- E9.9.1 Construct curb ramps, sidewalk ramps and multi-use path in accordance with referenced Standard Construction Specifications, Standard Details, and SDE drawings (attached).
- E9.9.2 Construct the lip of the depressed curb in accordance with SDE – 229E.
- E9.9.3 Construct sidewalk ramp grades in accordance with SD-229C and SD-229D.
- E9.9.4 Install one 610x1220mm tile for each curb ramp for sidewalks.
- E9.9.5 Install the detectable warning surface tile in accordance with the amended Manufacturer's Installation Manual (attached). Drill additional 6mm air vent holes in ribs under the tile as required and use vibration to help seat the tile and to facilitate the installation process.
- E9.9.6 Orient the detectable warning surface tiles according to the referenced drawings in this specification or as directed by the Contract Administrator.

E9.10 Medians and Refuge Islands:

- E9.10.1 Where the distance from back of curb to back of curb is 1.8m or greater, install one detectable warning surface tile 50mm from each curb.
- E9.10.2 Where the distance from back of curb to back of curb is less than 1.32m, fill the area between the curbs with detectable warning surface tile(s).

E9.11 Multi-use Paths

- E9.11.1 Construct a curb ramp with a 2.0m depressed curb in accordance with SDE-229E.
- E9.11.2 Construct a concrete sidewalk ramp 2.0m wide and 0.90m deep in accordance with SD-229C and SD-229D, to receive the tile.
- E9.11.3 Install one 610 x 1520mm tile for each curb ramp for multi-use paths.
- E9.11.4 Place the short edge of the tile parallel to the path and 50mm from the back of the depressed curb, centered on the depressed curb
- E9.11.5 If the width of the asphalt path is greater than the width of the concrete sidewalk ramp, path, construct a 1m long taper, or other length as required, to narrow the width of the asphalt path to meet the 2.0m wide concrete sidewalk ramp, as directed by the Contract Administrator.

MEASUREMENT AND PAYMENT

- E9.12 Supply and installation of detectable warning surface tiles will be measured on a unit basis and paid for at the Contract Unit Price per unit for "Items of Work" listed here below. The number of units to be paid for will be the total number of detectable warning surfaces supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

Detectable Warning Surfaces:

(a) 2' x 4' Armor Tile Cast in Place (Yellow)

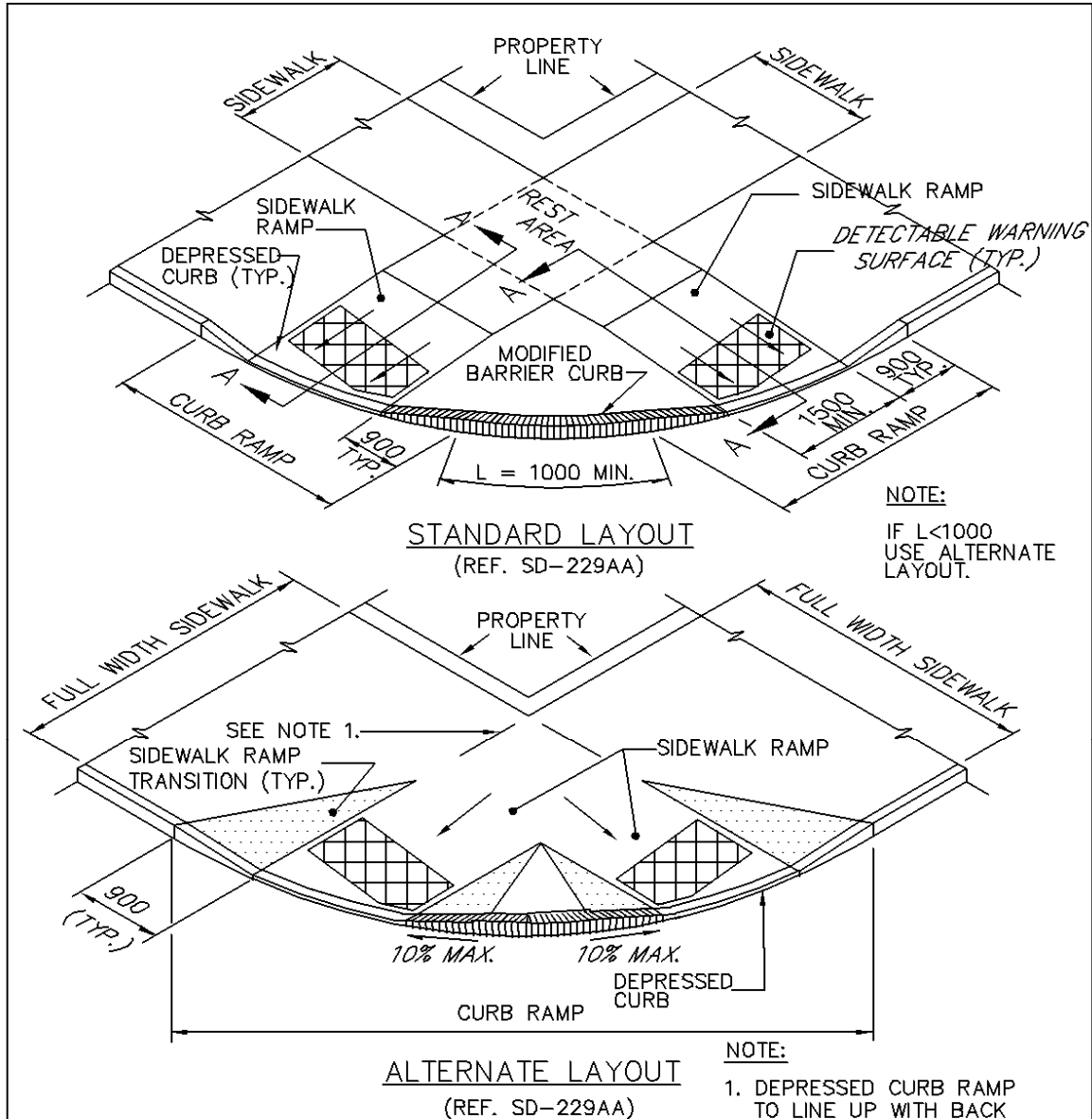
(b) 2' x 5' Armor Tile Cast in Place (Yellow)

E9.12.1 The area under the detectable warning surface tile is part of the sidewalk ramp and will be paid in accordance with CW 3235 and CW 3325.

E9.12.2 The sidewalk ramp will be paid as 100mm sidewalk in accordance with CW 3235 or CW 3325.

E9.12.3 Curb ramp will be paid in accordance with CW 3240 or CW 3310.

DRAWINGS AND INSTALLATION MANUAL



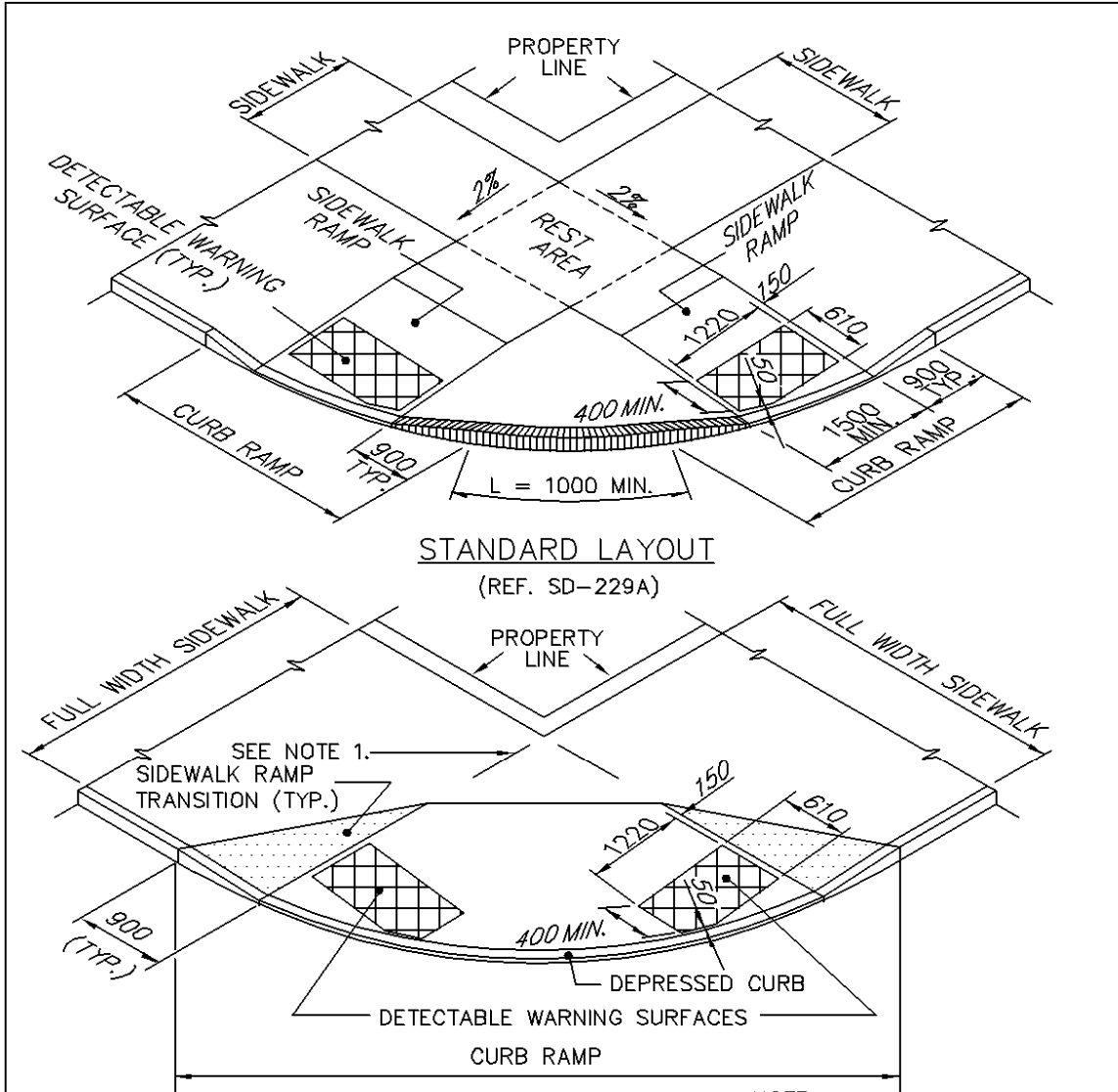
- NOTE:**
1. DEPRESSED CURB RAMP TO LINE UP WITH BACK OF SIDEWALK.
 2. FOR SECTION A-A SEE SD-229C & SD-229D
 3. SEE SDE-229AA, SDE-229BB & SDE-229E FOR DETECTABLE WARNING SURFACES.
- DIMENSIONS ARE IN MILLIMETRES

 **THE CITY OF WINNIPEG**
 PUBLIC WORKS DEPARTMENT

Reference Spec. No.
 CW 3235, CW 3310, CW 3325
 E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE


CURB RAMP LAYOUT FOR INTERSECTIONS

Designed By: B.P.	Drawn By: T.G.A..	Scale : N.T.S.
Checked By: F.W.C.	Date: 10-02-18	Drawing No. SDE-229A
Approved:		



- NOTE:**
1. DEPRESSED CURB RAMP TO LINE UP WITH BACK OF SIDEWALK.
 2. FOR A 1.83m WIDE SIDEWALK USE A DETECTABLE WARNING SURFACE MEASURING 610 X 1520

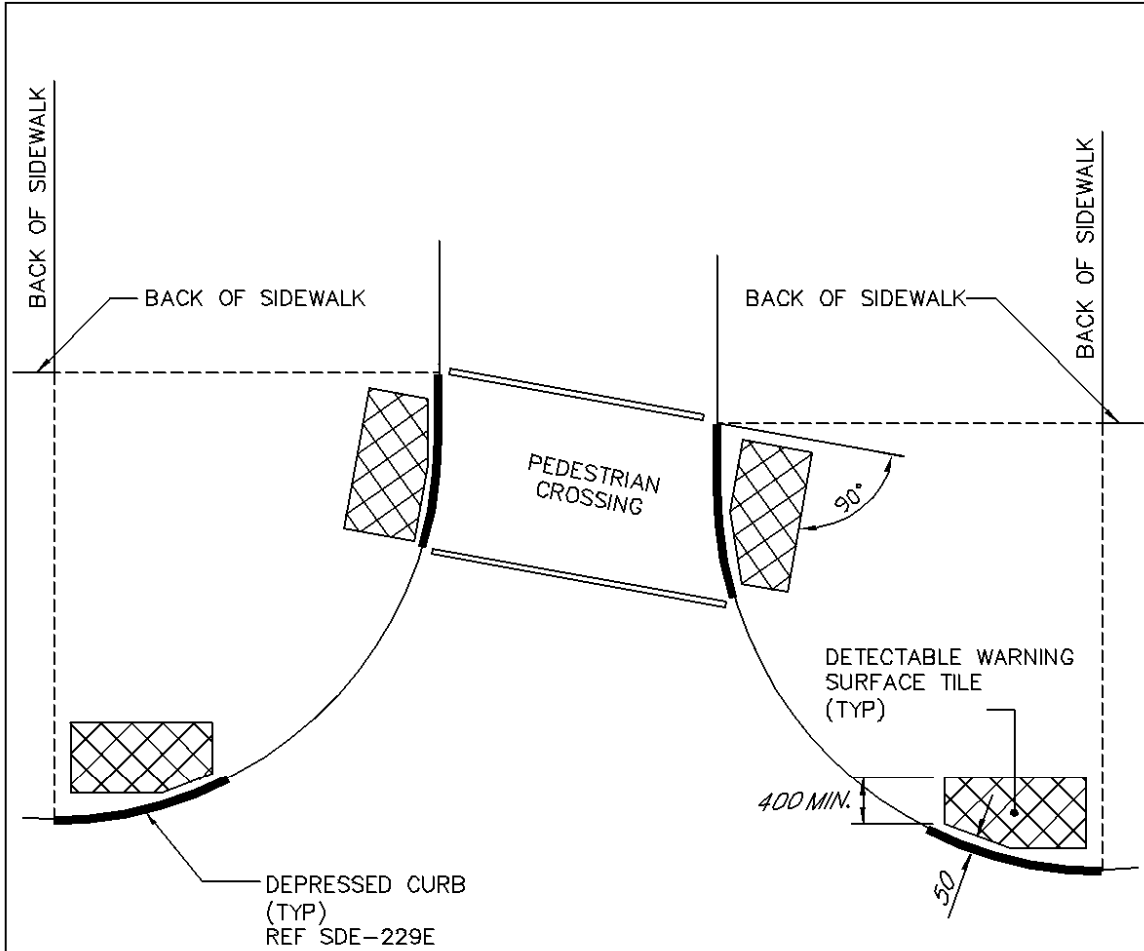
DIMENSIONS ARE IN MILLIMETRES

 **THE CITY OF WINNIPEG**
 PUBLIC WORKS DEPARTMENT

Reference Spec. No.
 CW 3235, CW 3310, CW 3325
 E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE


DETECTABLE WARNING SURFACE
 IN CURB RAMPS FOR
 INTERSECTIONS

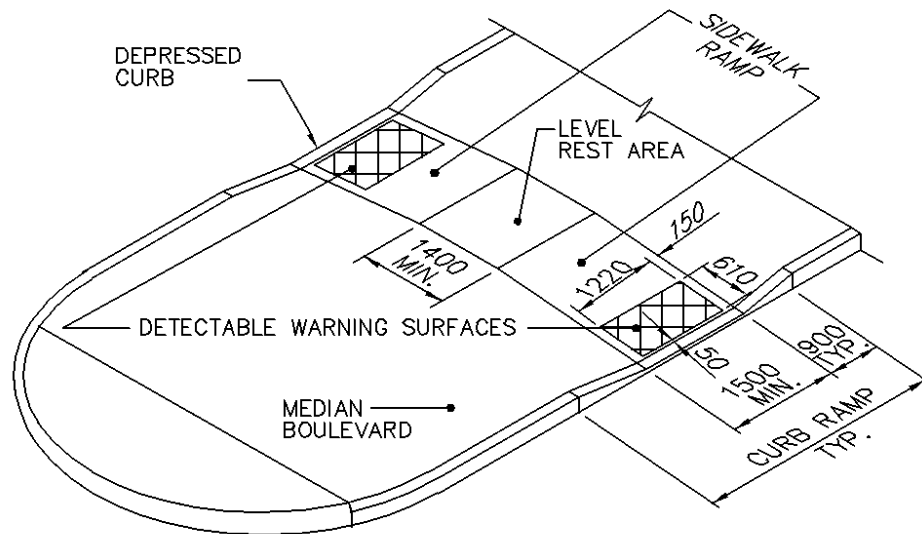
Designed By: B.P.	Drawn By: T.G.A.	Scale: N.T.S.
Checked By: F.W.C.	Date: 10-02-18	Drawing No.
Approved:	SDE-229AA	



NOTES:

1. LOCATE GRATINGS, ACCESS COVERS AND OTHER APPURTENANCES OUTSIDE OF CURB RAMPS, DEPRESSED CURBS, CLEAR SPACE LANDINGS AND GUTTERS AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
2. LOCATE END OF DEPRESSED CURB IN LINE WITH PROJECTED BACK OF SIDEWALK.


 THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT		DIMENSIONS ARE IN MILLIMETRES		
Reference Spec. No. CW 3235, CW 3310, CW 3325 E—SUPPLY & INSTALL DETECTABLE WARNING SURFACE		Designed By: B.P.	Drawn By: T.G.A.	Scale : N.T.S.
CURB RAMP LAYOUT FOR OFFSET INTERSECTIONS		Checked By: F.W.C.	Date: 10-02-18	Drawing No. SDE-229AB
		Approved:		

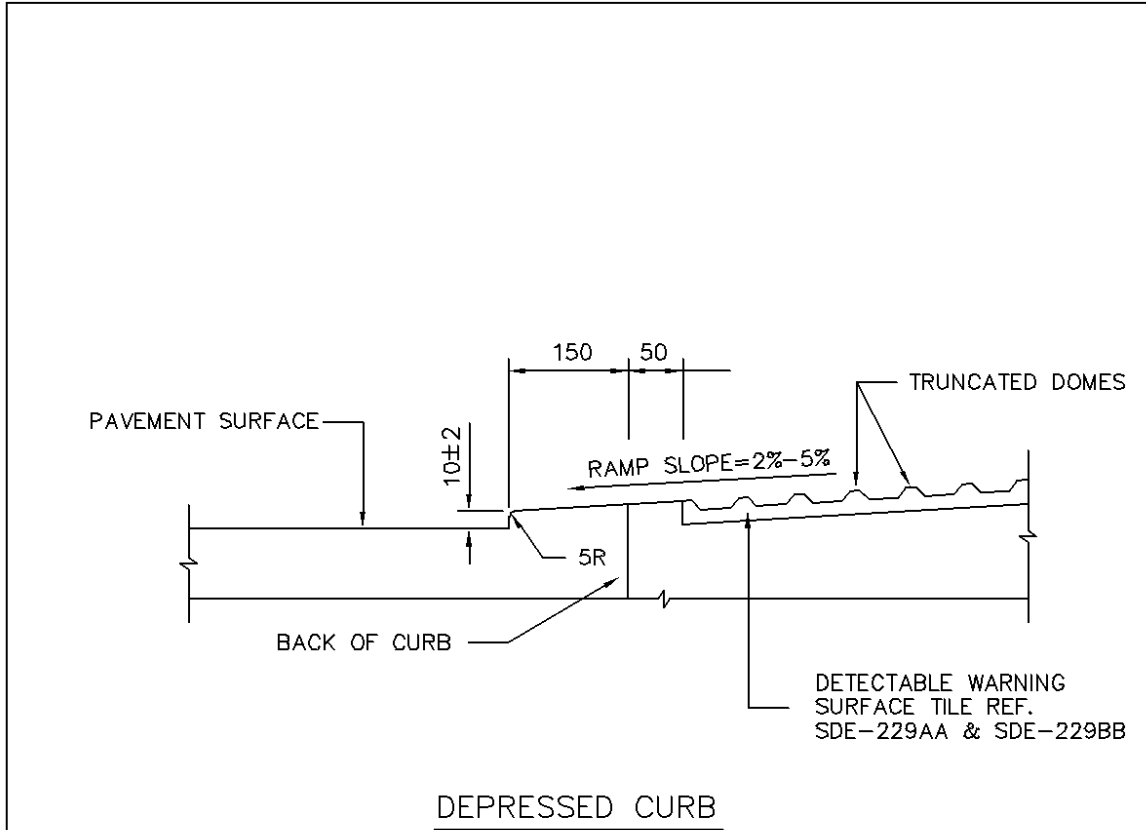


MEDIAN SIDEWALK CROSSING
 (REF. SD-229B)

NOTE:


1. FOR NARROW MEDIANS AND REFUGE ISLANDS < 1.32m IN WIDTH, PLACE DETECTABLE WARNING SURFACE FULL WIDTH BETWEEN CURBS.
2. DETECTABLE WARNING SURFACE SHALL NOT BE PLACED AT PRIVATE APPROACHES OR ALLEYS.
3. FOR A 1.83m WIDE SIDEWALK, USE A DETECTABLE WARNING SURFACE TILE MEASURING 610 X 1520.

 THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT		DIMENSIONS ARE IN MILLIMETRES		
Reference Spec. No. CW 3235, CW 3310, CW 3325 E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE		Designed By: B.P.	Drawn By: T.G.A.	Scale : N.T.S.
DETECTABLE WARNING SURFACE IN CURB RAMPS FOR MEDIANS		Checked By: F.W.C.	Date: 10-12-18	Drawing No. SDE-229BB
		Approved:		



NOTES:

- 1) SIDEWALK RAMP SURFACE SHALL BE GIVEN A PARALLEL TEXTURED BROOM FINISH.
- 2) INSTALL DETECTABLE WARNING SURFACE SO THAT THE TOP OF THE TRUNCATED DOMES ARE FLUSH WITH THE SURFACE FO THE ADJACENT SIDEWALK.

 <p>THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT</p>	DIMENSIONS ARE IN MILLIMETRES		
Reference Spec. No. CW 3235, CW 3310, CW 3325 E-SUPPLY & INSTALL DETECTABLE WARNING SURFACE			
<p>CURB RAMP DEPRESSED CURB</p>	Designed By: B.P.	Drawn By: T.G.A.	Scale : N.T.S.
	Checked By: F.W.C.	Date: 10-02-18	Drawing No. SDE-229E
	Approved:		

Manufacturer's Installation Manual Armor-Tile Cast In Place

Inline Dome Detectable/Tactile Warning Surface Tile

- A. During Cast In Place Detectable/Tactile Warning Surface Tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.
- B. The specifications of the structural embedment flange system and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers. Not recommended for asphalt applications.
- C. The physical characteristics of the concrete shall be consistent with the contract specifications while maintaining a slump range of 4 – 7 to permit solid placement of the Cast In Place Detectable/Tactile Warning Surface Tile system. An overly wet mix will cause the tile to float. Under these conditions, suitable weights such as 2 concrete blocks or sandbags (25 lb) shall be placed on each tile.
- D. Prior to placement of the Cast In Place Detectable/Tactile Warning Surface Tile system, the contract drawings shall be reviewed.
- E. The concrete pouring and finishing operations require typical mason's tools, however, a 4' long level with electronic slope readout, 25 lb. weights, and a large non-marring rubber mallet are specific to the installation of the Cast In Place Detectable/Tactile Warning Surface Tile system. A vibrating mechanism such as that manufactured by Vibco can be employed, if desired. The vibrating unit should be fixed to a soft base such as wood, at least 1 foot square.
- F. The factory-installed plastic sheeting must remain in place during the entire installation process to prevent the splashing of concrete onto the finished surface of the tile.
- G. When preparing to set the tile, it is important that NO concrete be removed in the area to accept the tile. It is imperative that the installation technique eliminates any air voids under the tile. Holes in the tile perimeter allow air to escape during the installation process. Concrete will flow through the large holes in each embedment flange on the underside of the tile. This will lock the tile solidly into the cured concrete.
- H. The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. Immediately after finishing concrete, the electronic level should be used to check that the required slope is achieved. The tile shall be placed in accordance with the contract drawings. The Cast In Place Detectable/Tactile Warning Surface Tiles shall be tamped (or vibrated) into the fresh concrete to ensure that the field level of the tile is flush to the adjacent concrete surface. The embedment process should not be accomplished by stepping on the tile as this may cause uneven setting which can result in air voids under the tile surface. ~~The contract drawings indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes.~~
- I. In cold weather climates it is recommended that the Cast In Place Detectable/Tactile Warning Surface Tiles be set deeper such that the top of domes are level to the adjacent concrete on the top and sides of ramp and that the base of domes to allow water drainage. This installation will reduce the possibility of damage due to snow clearing operations.
- J. Immediately after placement, the tile elevation is to be checked to adjacent concrete. The elevation and slope should be set consistent with contract drawings to permit water drainage to curb as the design dictates.
- K. While concrete is workable, a 3/8" radius edging tool shall be used to create a finished edge of concrete, then a steel trowel shall be used to finish the concrete around the tile's perimeter, flush to the field level of the tile.
- L. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external force placed on the tile that may rock the tile causing a void between the underside of tile and concrete.
- M. Following tile placement, review installation tolerances to contract drawings and adjust tile before the concrete sets. Two suitable weights of 25 lb each shall be placed on each tile as necessary to ensure solid contact of the underside of tile to concrete.
- N. Following the concrete curing stage, protective plastic wrap is to be removed from the tile surface by cutting the plastic with a sharp knife, tight to the concrete/tile interface. If concrete bled under the plastic, a soft brass wire brush will clean the residue without damage to the tile surface.
- O. If desired, individual tiles can be bolted together using ¼ inch or equivalent hardware. This can help to ensure that adjacent tiles are flush to each other during the installation process. Tape or caulking can be placed on the underside of the bolted butt joint to ensure that concrete does not rise up between the tiles during installation. Any protective plastic wrap which was peeled back to facilitate bolting or cutting, should be replaced and taped to ensure that the tile surface remains free of concrete during the installation process.
- P. Tiles can be cut to custom sizes, or to make a radius, using a continuous rim diamond blade in a circular saw or mini-grinder. Use of a straightedge to guide the cut is advisable where appropriate.
- Q. ~~Any sound-amplifying plates on the underside of the tile, which are dislodged during handling or cutting, should be replaced and secured with construction adhesive. The air gap created between these plates and the bottom of the tile is important in preserving the detectability properties of the Armor-Tile system as required in various jurisdictions.~~

E10. COORDINATION OF CONSTRUCTION WITH CN RAIL

E10.1 General Requirements

- E10.1.1 The Contractor shall be responsible to meet all Canadian National (CN), constraints, requirements, and safety measures.
- E10.1.2 The Contractor shall not enter into CN property at any time unless he has obtained permission from CN and adheres to CN safety measures.
- E10.1.3 CN Safety Requirements are included in Appendix B.

E11. CONCRETE TRAFFIC BARRIER – TYPE 2

DESCRIPTION

E11.1 General

- (a) This specification shall cover the furnishing and placing of Type 2 (450mm, Cast-in-place) Portland Cement Concrete Barrier on the accepted and prepared sub-base and base course or on existing pavement.
- (b) This specification supplements City of Winnipeg Standard Construction Specification CW 3310 – Portland Cement Concrete Works.

MATERIALS

- E11.2 As per CW 3310

CONSTRUCTION METHODS

- E11.3 As per CW 3310

MEASUREMENT AND PAYMENT

E11.4 Concrete Barrier – (Type 2)

- (a) Concrete Barrier installation will be measured on a length basis and paid for at the Contract Unit Price per metre for “Concrete Barrier – (Type 2)”. The length to be paid for will be the total number of metres of cast in place concrete barrier installed in accordance with this specification, accepted and measured by the Contract Administrator.

E12. SIGN SUPPORT CLAMPS

- E12.1 The Contractor shall install all new sign support clamps at the locations shown on the drawings or as directed by the Contract Administrator. The City shall supply all sign support clamps and parking meter poles.
- E12.2 There shall be no measurement or payment for the installation of sign support clamps in accordance with this specification.

E13. BASE COURSE AND SUB-BASE MATERIAL

DESCRIPTION

E13.1 General

- (a) This specification shall supplement the specification for Base Course and Sub-Base material found in CW 3110.

MATERIALS

E13.2 Base Course and Sub-Base Material

- (a) All material shall be Crushed Limestone supplied and installed in accordance with CW 3110.
- (b) Use of Recycled Concrete Pavement will not be permitted.

CONSTRUCTION METHODS

E13.3 As per CW 3110.

MEASUREMENT AND PAYMENT

E13.4 As per CW 3110.

E14. REMOVAL OF CHAIN LINK FENCE

DESCRIPTION

E14.1 General

- (a) This specification shall cover the removal of the existing chain link fence at VIA Rail, and be supplemental to the installation of the new fence at the VIA Rail yard.

EXECUTION

E14.2 Remove all objects designated by the Contract Administrator for removal, including any concrete bases visible or not, and barbed wire. Fill and re-grade any holes created from the removal of the concrete bases using an acceptable fill as approved by the Contract Administrator.

E14.3 The new fence shall be erected prior to the construction of the VIA Rail parking lot to maintain security for VIA. The limits shall be the limits outlined on the drawings and as directed by the Contract Administrator.

E14.4 All debris is to be removed from the Site and disposed of or salvaged by the Contractor.

MEASUREMENT AND PAYMENT

E14.5 The Removal of the existing chain link fence will be measured on a length basis and paid for at the Contract Unit Price per lineal meter for "Removal of Chain Link Fence". The length to be paid for will be the total number of lineal meters of chain link fence removed in accordance with this specification, accepted and measured by the Contract Administrator.

E15. CHAIN LINK FENCE WITH BARBED WIRE

DESCRIPTION

E15.1 General

- (a) This specification shall be supplemental to CW 3550 of the City of Winnipeg Standard Construction Specifications.

MATERIALS

E15.2 Barbed Wire Material

- (a) Barbed wire material shall be 3-strand barbed wire.

EXECUTION

E15.3 3-strand barbed wire shall be placed at the top of the 3050 mm fence at the VIA Rail Yards.

MEASUREMENT AND PAYMENT

E15.4 The barbed wire installation shall be paid for as incidental to the installation of the 3050 mm high fence.

E16. CATCHBASIN AND CATCHPIT WITH SQUARE FRAME AND COVER

DESCRIPTION

E16.1 General

- (a) This specification shall cover the supply and installation of a standard SD-024 catchbasin or SD-023 catchpit with a square frame and cover. The square frame and cover is different from the City of Winnipeg Approved Product Barrier Curb and Gutter Inlet Frame and Cover listed in AP-008 and AP-009.

MATERIALS

E16.2 Materials for SD-024 and SD-023 as per City of Winnipeg Standards.

E16.3 As per City of Winnipeg Standard Specifications and the Contract Drawings.

E16.4 Frame and Cover shall be a TF-107-6" as supplied by Titan Foundry of Winnipeg, Manitoba. The TF-107-6" can be found at the following link:
<http://www.trojanindustries.com/cms/doc/Titan%20-%20Catch%20Basin%20Frames%20and%20Covers.pdf>

CONSTRUCTION METHODS

E16.5 Construction methods for SD-024 and SD-023 as per City of Winnipeg Standards.

E16.6 Contractor to place frame and cover as per CW 2130 and Contract Drawings.

MEASUREMENT AND PAYMENT

E16.7 Supply and Install of a Catchbasin or a Catchpit with a square Frame and Cover will be measured and paid for at the Contract Unit Price as a standard Catchbasin (SD-024) and/or a standard Catchpit (SD-023) described in CW 2130 in accordance with this specification and accepted by the Contract Administrator. No additional measurement or payment will be made for the use of a TF-107-6" as opposed to any other frame and cover that may be required.

E17. DITCH INLET GRATES

DESCRIPTION

E17.1 General

- (a) This specification covers the supply and installation of "Beehive" manhole covers, typically used in open swales or ditches as an alternative to City of Winnipeg Approved Product grated manhole cover AP-006.

MATERIALS AND EQUIPMENT

E17.2 As per Contract Drawings.

E17.3 All steel shall be supplied in accordance with details on the Contract Drawings. All steel shall be hot dip galvanized after fabrication and all hardware shall be stainless steel.

E17.4 Cover to be Shopost Iron Works MK-A1 or approved equal.

CONSTRUCTION METHODS

E17.5 General

- (a) Contractor to securely affix "beehive" cover to manhole reducer or riser utilizing stainless steel hardware.
- (b) Any galvanized surfaces that are damaged shall be coated with a galvanizing compound approved by the Contract Administrator

MEASUREMENT AND PAYMENT

E17.6 "Beehive" Manhole Covers will be measured on a unit basis and paid for at the Contract Unit Price per cover as "Beehive Manhole Covers". The number to be paid for will be the total number of 'Beehive' Manhole Covers installed in accordance with this specification and accepted by the Contract Administrator.

E18. TREE REMOVALS

DESCRIPTION

E18.1 General

- (a) This Special Provision shall amend the City of Winnipeg Standard Construction specification CW 3010 "Clearing and Grubbing", and shall cover the removal of trees as specified on the Contract Drawings. The City of Winnipeg, Forestry Branch must be contacted prior to removing any trees.

CONSTRUCTION METHODS

E18.2 Tree Removals

- (a) Remove only trees marked and confirmed for removal in the field by the Contract Administrator.
- (b) Remove trees in accordance with CW 3010.
- (c) The Contractor shall arrange for any Elmwood to be disposed of by the City of Winnipeg.

MEASUREMENT AND PAYMENT

E18.2.1 Removal of trees will be measured on a unit basis and paid for at the Contract Unit Price per unit item of "Tree Removal". The number to be paid for will be the total number of trees removed in accordance with this specification and accepted by the Contract Administrator

E19. CONSTRUCTION OF TINTED CONCRETE

DESCRIPTION

E19.1 General

- (a) This specification covers the construction of "red" tinted concrete pavement, intended to delineate Transit only lanes at various locations in this project. The tinted concrete is finished at grade and is the width of the travel lane. Care must be taken with consistency in water/cement ratio and finishing as the color can be affected load to load.

- (b) Red tinted concrete is to be used at the Fort Rouge Station, and the Warsaw transitway entrance as directed by the Contract Administrator.
- (c) Referenced Standard Construction Specifications
 - (i) CW 3310 – Portland Cement Concrete Pavement Works

MATERIALS AND EQUIPMENT

E19.2 Concrete Materials

- (a) The Contractor shall base the tinted concrete mix on a mix design that has been approved for the 2009 construction season by the City of Winnipeg Research and Standards Department.
- (b) The base mix design shall conform to Section 6 of CW 3310 with the following alterations:
 - (i) Type 1 mix as per Section 6.2 of CW 3310
 - (ii) Slump for hand placement shall be 80 mm +/- 20 mm prior to adding superplasticizers (if needed) to facilitate finishing without adding water to the surface.
- (c) Alterations to the base mix design will be considered by the Contract Administrator if necessary to account for the concrete tint material and finishing operations.

E19.3 Concrete Tint

- (a) "Red" coloured metal oxide pigment used to permanently color ready-mix concrete.
- (b) Approved Product List
 - (i) Lafarge Red (Premium) supplied through L.M. Scofield Company
 - (ii) SG160-2 Sunrise Red supplied through L.M. Scofield Company
- (c) Contractor to cast one coloured concrete sample minimum 200 mm X 200 mm in area using base concrete mix for approval by Contract Administrator.
- (d) Tinted concrete shall not be placed until sample color has been accepted by the Contract Administrator. The Contractor shall demonstrate that the sample will achieve the approximate color advertised by the pigment supplier using local concrete mix materials.

E19.4 Superplasticizers

- (a) Superplasticizers shall conform to the requirements of CSA CAN3-A266.5 and CAN3-A266.6, but must be compatible with the air-entraining agent. The agent shall be free of chlorides and shall not affect the air-entraining agent's ability to produce a satisfactory air void system.

E19.5 Liquid Membrane-Forming Curing Compound

- (a) Curing Compound shall be clear (no pigment), and water based conforming to the requirements of ASTM C309.

E19.6 Other Materials

- (a) All other materials as per CW 3310

E19.7 Floating and Finishing Equipment

- (a) Use only wood or magnesium floats. Bull floats used for initial finishing shall be constructed of wood only.

E19.8 Other Equipment

- (a) All other equipment as per CW 3310

CONSTRUCTION METHODS

E19.9 General

- (a) Concrete formwork, steel reinforcement, placement, curing, and joint sealing as per CW 3310 except as modified in the following clauses.
- (b) As shown on the drawings, construct formed 50 mm headers to define the lane edge and transverse termination of at-grade coloured concrete where the adjacent pavement is to be asphalt overlaid.
- (c) Clean finishing tools and equipment and let dry prior to finishing. Wet tools will fade the colouring. Wetting of tools during finishing operation is not permitted.
- (d) Place concrete at a consistent slump. No water shall be added on Site. Superplasticizer may be added at a rate suggested by the concrete supplier if additional workability is needed.
- (e) No localized water spray or fogging is permitted to assist in finishing as this will locally fade the colour.
- (f) Clear curing compound only shall be used. The use of water curing or plastic film is not allowed. Plastic film for insulation in cold weather must be approved by the Contract Administrator.

MEASUREMENT AND PAYMENT

E19.10 Construction of Tinted Concrete

- (a) Construction of Tinted Concrete will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Construction of 230 mm Concrete Pavement (Plain-Dowelled, Tinted)" listed below. The area to be paid for will be the total number of square meters of tinted concrete supplied and placed at grade, or below an asphalt overlay in accordance with this specification and accepted by the Contract Administrator.

E20. SHOP DRAWINGS

DESCRIPTION

E20.1 This Specification provides instructions for the preparation and submission of shop drawings.

- (a) The term 'shop drawings' means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, including Site erection drawings which are to be provided by the Contractor to illustrate details of a portion of the Work.
- (b) The Contractor shall submit specified shop drawings to the Contract Administrator for review. All submissions must be in metric units. Where data is in imperial units, the correct metric equivalent shall also be show on all submissions for Contract Administrator review.

E20.2 Shop Drawings

- (a) Original drawings are to be prepared by Contractor, Subcontractor, supplier, distributor, or manufacturer, which illustrate appropriate portion of Work; showing fabrication, layout, setting or erection details as specified in appropriate sections.
- (b) Shop drawings for the following structural components shall bear the seal of a registered Engineer of Manitoba.
 - (i) Metal Fabrications
 - (ii) Shoring

E20.3 Contractor's Responsibilities

- (a) Review shop drawings, product data and samples prior to submission and stamp and sign drawings indicating conformance to the Contract requirements.
- (b) Verify:
 - (i) Field Measurements
 - (ii) Field Construction Criteria

- (iii) Catalogue numbers and similar data
- (c) Coordinate each submission with requirements of Work and Contract Documents. Individual shop drawings will not be reviewed until all related drawings are available.
- (d) Notify Contract Administrator, in writing at time of submission, of deviations from requirements of Contract Documents.
- (e) Responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator's review of submission, unless Contract Administrator gives written acceptance of specified deviations.
- (f) Responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.
- (g) The Contractor shall make any corrections required by the Contract Administrator and shall resubmit the required number of corrected copies of Shop Drawings. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Contract Administrator on previous submission.
- (h) After Contract Administrator's review and return of copies, distribute copies to subtrades as appropriate.
- (i) Maintain one (1) complete set of reviewed shop drawings, filed by Specification Section Number, at the Site of the Work for use and reference of the Contract Administrator and SubContractors.

E20.4 Submission Requirements

- (a) Schedule submissions at least fourteen (14) Calendar Days before dates reviewed submissions will be needed, and allow for a fourteen (14) Calendar Day period for review by the Contract Administrator of each individual submission and re-submission, unless noted otherwise in the Contract Documents.
- (b) Submit two (2) paper prints of shop drawings. The Contractor is advised that the Contract Administrator will retain one (1) copy of all submittals and return one (1) copy to the Contractor.
- (c) Accompany submissions with transmittal letter, containing:
 - (i) Date
 - (ii) Project title and Bid Opportunity number
 - (iii) Contractor's name and address
 - (iv) Number of each shop drawing, product data and sample submitted
 - (v) Specification Section, Title, Number and Clause
 - (vi) Drawing Number and Detail/Section Number
 - (vii) Other pertinent data
- (d) Submissions shall include:
 - (i) Date and revision dates.
 - (ii) Project title and Bid Opportunity number.
 - (iii) Name of:
 - 1. Contractor
 - 2. SubContractor
 - 3. Supplier
 - 4. Manufacturer
 - 5. Separate detailer when pertinent
 - (iv) Identification of product of material.
 - (v) Relation to adjacent structure or materials.
 - (vi) Field dimensions, clearly identified as such.
 - (vii) Specification section name, number and clause number or drawing number and detail/section number.
 - (viii) Applicable standards, such as CSA or CGSB numbers.

- (ix) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract Documents.
- (e) Other Considerations
 - (i) Fabrication, erection, installation or commissioning may require modifications to equipment or systems to conform to the design intent. Revise pertinent shop drawings and resubmit.
 - (ii) Material and equipment delivered to the Site of the Works will not be paid for at least until pertinent shop drawings have been submitted and reviewed.
 - (iii) Incomplete shop drawing information will be considered as stipulated deductions for the purposes of progress payment certificates.
 - (iv) No delay or cost claims will be allowed that arise because of delays in submissions, re-submissions and review of shop drawings.

E21. STRUCTURAL CONCRETE

DESCRIPTION

- E21.1 This Specification shall cover the preparation of Portland Cement Structural Concrete for, and all concreting operations related to, the construction of Portland Cement Structural Concrete Works as specified herein.
- E21.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

MATERIALS

- E21.3 General
- (a) The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.
- E21.4 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 CAN/CSA-A23.1.
- E21.5 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.
- E21.6 Bonding Agents
- (a) The Contractor shall identify the product(s) and submit product information to the Contract Administrator for review and approval.
- E21.7 Curing Compound

- (a) If permitted for use, curing compound shall be liquid membrane-forming and conform to the requirements of ASTM Standard C309 and the proposed standard ASTM P198. Rate of application shall be 1.5 times the rate required to meet the requirements of ASTM P198 for the texture of concrete to which the curing compound is being applied.
- (b) Curing compounds shall be resin-based and white-pigmented.

E21.8 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.

E21.9 Non-Shrink Cementitious Grout

- (a) Where non-shrink cementitious grout is used, it shall be Sternson M-bed Standard, Specialty Construction Products CPD Non-Shrink Grout, Sika 212 Non-Shrink Grout, Meadows CG-86, or approved equal as accepted by the Contract Administrator. The minimum compressive strength of the grout at 28 days shall be 40 MPa.

E21.10 Formwork

- (a) Formwork materials shall conform to CSA Standard CAN/CSA-A23.1, and American Concrete Publication SP:4, "Formwork for Concrete".
- (b) No "stay-in-place" formwork or falsework is permitted.
- (c) 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.
- (d) 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".
- (e) Boards used for formwork shall be fully seasoned and free from defects such as knots, warps, cracks, etc., which may mark the concrete surface.
- (f) 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 non-rusting material or galvanized steel; and they shall not stain, blemish, or spall the concrete surface for the life of the concrete.
- (g) 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.
- (h) 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.
- (i) Walers shall be spruce or pine, with minimum dimensions of 100 mm x 150 mm.
- (j) 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.

E21.11 Permeable Formliner

- (a) Formliner shall be Hyroform, Texel Drainaform or approved equal as accepted by the Contract Administrator.

E21.12 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: C-1
 - (ii) Compressive Strength @ 28 days = 35 MPa
 - (iii) Water / Cementing Materials Ratio = 0.4
 - (iv) Air Content: Category 1 per Table 4 of CSA A23.1-04
- (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 abutment and pier cap repairs.
- (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.

E21.13 Aggregates

- (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.

E21.14 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.

E21.15 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.

E21.16 Water

- (a) Water to be used for mixing and curing concrete or grout and saturating substrate shall conform to the requirements of CSA A23.1 and shall be free of oil, alkali, acidic, organic materials or deleterious substances.

E21.17 Concrete Supply

- (a) Concrete shall be proportioned, mixed, and delivered in accordance with the requirements of CSA A23.1, except that the transporting of ready mixed concrete in non-agitating equipment will not be permitted unless prior written approval is received from the Contract Administrator.
- (b) Unless otherwise directed by the Contract Administrator, the discharge of ready mixed concrete shall be completed within 120 minutes after the introduction of the mixing water to the cementing materials and aggregates.
- (c) The Contractor shall maintain all equipment used for handling and transporting the concrete in a clean condition and proper working order.

E21.18 Flexible Joint Sealant

- (a) Flexible joint sealant for all horizontal, vertical, and sloping joints shall be guaranteed non-staining grey polyurethane, approved by the Contract Administrator and applied in strict accordance with the manufacturer's instructions, including appropriate primers. Approved products are Vulkem 116 by Mameco; Sonolastic NP1 by Sonneborne; RC-1 by Permapol; and Sikaflex by Sika; or approved equal as accepted by the Contract Administrator.

E21.19 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 as accepted by the Contract Administrator.

E21.20 Expanding Joint Filler

- (a) Expanding joint filler shall be compressed to 20 percent of its expanded width and be a polyurethane foam, impregnated throughout with a latex modified asphalt. An approved product is "Emseal," by Emseal Corporation. Expanding joint filler to be installed as per Manufacturer's instructions.

E21.21 Miscellaneous Materials

- (a) The Contractor shall supply all materials, as approved by the Contract Administrator, to ensure the satisfactory completion of the concrete repair works.

EQUIPMENT

E21.22 General

- (a) All equipment shall be of a type accepted by the Contract Administrator. The equipment shall be in good working order, kept free from hardened concrete or foreign materials, and shall be cleaned at frequent intervals.
- (b) The Contractor shall have sufficient standby equipment available on short notice at all times.

E21.23 Vibrators

- (a) The Contractor shall have sufficient numbers of internal concrete vibrators and experienced operators on-site to properly consolidate all concrete in accordance with ACI 309. The type and size of vibrators shall be appropriate for the particular application, the size of the pour, and the amount of reinforcing and shall conform to standard construction procedures.
- (b) The Contractor shall use rubber coated vibrators for consolidating concrete.
- (c) The Contractor shall have standby vibrators available at all times during the pour.

E21.24 Miscellaneous Equipment

- (a) The Contractor shall provide all miscellaneous equipment as required to properly and thoroughly execute and complete all operations related to the supply and placement of structural concrete.

CONSTRUCTION METHODS

E21.25 General

- (a) The Works involving Structural Concrete include the construction of:
 - (i) Organza Retaining Wall including removal of Existing Concrete Wall;
 - (ii) Gord's Retaining Wall and Structural Slab.

E21.26 Removal of Existing Concrete Wall

- (a) The Contractor shall remove and dispose of the existing concrete wall and fence to the limits as shown on the Drawings. The Contractor shall provide a rough finish on the sawcut face of the existing concrete wall to provide a good bond surface. No additional payment will be made for this Work as it is considered incidental to the Contract Unit Price for "Supply and Place Structural Concrete".

E21.27 Concrete Working Base

- (a) Upon completion of all excavation, the bottom of the excavation shall be inspected by the Contract Administrator. Concrete working base shall be installed where shown on the Drawings. Under no circumstances shall the Contractor place the concrete working base without the prior approval from the Contract Administrator. The supply and installation of working base will be considered incidental to the unit cost for "Supply and Place Structural Concrete", and no separate payment will be made.

E21.28 Form Work and Shoring

- (a) Formwork shall be designed, erected, braced, and maintained to safely support all vertical and lateral loads until such loads can be supported by the concrete.
- (b) As a maximum, the following spacings shall apply, for studding and whaling:
 - (i) 20 mm plywood: studding - 450 mm centre to centre
 - (ii) walers - 760 mm centre to centre
- (c) Forms shall be clean before use. Plywood and other wood surfaces shall be sealed against adsorption of moisture from the concrete by a field-applied form coating or a factory-applied liner.
- (d) Form accessories to be partially or wholly embedded in the concrete, such as ties and hangers, shall be a commercially manufactured type. The portion remaining within the concrete shall leave no metal within 50 mm of the surface when the concrete is exposed to view. Spreader cones on ties shall not exceed 25 mm in diameter.
- (e) All exposed edges shall be chamfered 25 mm unless otherwise noted on the Drawings.
- (f) Slots, recesses, chases, sleeves, inserts, bolts, hangers, and other items shall be formed or set in coordination and cooperation with the trade concerned. No openings shall be made in structural members that are not shown on the structural drawings without the prior approval of the Contract Administrator.
- (g) Shores shall be provided with positive means of adjustment (jacks or wedges). All settlement shall be taken up before or during concreting as required.
- (h) Mud sills of suitable size shall be provided beneath shores, bedded in sand or stone, where they would otherwise bear on soil. The soil below shores must be adequately prepared to avoid settlements during or after concreting. Shores must not be placed on frozen ground.
- (i) Brace shores horizontally in two directions and diagonally in the same two vertical planes so that they can safely withstand all dead and moving loads to which they will be subjected.
- (j) The loads and lateral pressures are outlined in Part 3, Section 102 of "Recommended Practice for Concrete Formwork," (ACI 347). Additional design considerations concerning factors of safety for formwork elements and allowable settlements outlined in Section 103 of the above reference shall apply.
- (k) Formwork shall have sufficient strengths and rigidity so that the resultant finished concrete conforms to the shapes, lines, and dimensions of the members shown on the Drawings.
- (l) Formwork shall be constructed to permit easy dismantling and stripping and such that removal will not damage the concrete. Provision shall be made in the formwork for shores to remain undisturbed during stripping where required.
- (m) Formwork shall be cambered, where necessary to maintain the specified tolerances, to compensate for anticipated deflections in the formwork due to the weight and pressure of the fresh concrete and due to construction loads.
- (n) Forms shall be sufficiently tight to prevent leakage of grout or cement paste.
- (o) Form panels shall be constructed so that the contact edges are kept flush and aligned.
- (p) All form lumber, studding, etc. becomes the property of the Contractor when the Work is finished, and it shall be removed from the concrete and the Site by the Contractor after the concrete is set, free of extra charge, and the entire Site left in a neat and clean condition.
- (q) It shall be permissible to use the forms over again where possible, provided they are thoroughly cleaned and in good condition after being removed from the former portions of the Work. The Contract Administrator shall be the sole judge of their condition and his decision shall be final regarding the use of them again.

E21.29 Formliner

- (a) Formliners shall be used on all exposed formed surfaces, except soffit surfaces.

E21.30 General Curing

- (a) The use of curing compound will not be allowed on concrete areas that are to receive additional concrete or waterproofing.
- (b) Unformed concrete surfaces shall be covered and kept moist by means of wet polyester blankets for seven (7) consecutive days immediately following finishing operations or otherwise approved by the Contract Administrator and shall be maintained at above 10°C for at least seven (7) consecutive days thereafter. Construction joints shall only be covered and kept saturated by means of wet polyester curing blankets for the curing period.
- (c) If permitted for use, curing compounds shall be applied at the rate of not less than 4 m²/L. The compound must be applied uniformly and by roller. Spraying of the compound will not be permitted.
- (d) 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.
- (e) Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3° in anyone hour period or 20° in any twenty-four hour period.
- (f) Formed surfaces shall receive, immediately after stripping and patching, the same application of curing compound as finished surfaces.
- (g) After completing the finishing of unformed surfaces, where curing compound is not permitted, the surfaces shall be promptly covered with a minimum of a single layer of clean, damp polyester curing blanket and 6 mil polyethylene.
- (h) Care shall be exercised to ensure that the polyester curing blanket is well drained and that it is placed as soon as the surface will support it without deformation. The Contractor shall ensure that water from the polyester curing blankets does not run into areas where concrete placement and finishing operations are underway. If this occurs, concrete placement shall stop until the problem is corrected satisfactory to the Contract Administrator.

E21.31 Placing Concrete

- (a) The Contract Administrator must be notified at least 24 hours prior to concrete placement so that an adequate inspection may be made of formwork, shoring, reinforcement, and related works. Placement without required prior notification will not be allowed.
- (b) Equipment for mixing or conveying concrete shall be thoroughly flushed with clean water before and after each pour. Water used for this purpose shall be discharged outside the forms.
- (c) Concrete shall be conveyed from the mixer to the place of final deposit by methods that will prevent segregation and a marked change in consistency.
- (d) Before depositing any concrete, all debris shall be removed from the space to be occupied by the concrete and any mortar splashed upon the reinforcement or forms shall be removed.
- (e) Placing of concrete, when started, shall be continuous. No concrete shall be placed against concrete that has sufficiently hardened to cause the formation of seams or "cold joints" within the section. If placing must be interrupted, construction joints shall be located where shown on the Drawings or as approved.
- (f) Concrete shall be placed as nearly as possible to its finish position. Rakes or mechanical vibrators shall not be used to transport concrete.
- (g) The maximum drop of free concrete into the forms shall not be greater than 1.5 m; otherwise, rubber tubes or pouring ports spaced not more than 1.5 m vertically and 2.5 m horizontally shall be used.
- (h) All concrete, during and immediately after deposition, shall be consolidated by mechanical vibrators so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into the corners of the forms; eliminating all air or stone pockets that

may cause honeycombing, pitting or planes of weakness. Mechanical vibrators, when immersed, shall have a minimum frequency of 7,000 revolutions per minute.

- (i) Vibrators shall be inserted systematically into the concrete at intervals such that the zones of influence of the vibrator overlap (generally 300 to 900 mm). Apply the vibrator at any point until the concrete is sufficiently compacted (5 to 15 seconds) but not long enough for segregation to occur. Spare vibrators in working condition shall be kept on the job Site during all placing operations.
- (j) Concrete shall not be placed in rain or snow, unless adequate protection is provided for formwork and concrete surfaces.

E21.32 Finishing of Unformed Surfaces

- (a) Screeding of all unformed concrete surfaces shall be performed by the sawing movement of a straight edge along wood or metal strips or form edges that have been accurately set at required elevations.
- (b) Screeding shall be done on all concrete surfaces as a first step in other finishing operations. Screeding shall be done immediately after the concrete has been vibrated.
- (c) After screeding, the concrete shall not be worked further until ready for floating. Floating shall begin when the water sheen has disappeared. The surface shall then be consolidated with hand floats. Concrete surfaces after floating shall have a uniform, smooth, granular texture.
- (d) The surface of the structural sidewalk shall be given a transverse broom finish.

E21.33 Form Removal

- (a) All forms shall remain in place for a minimum of seven (7) days. The Contract Administrator must be notified at least 24 hours prior to any form removal. The Contractor must receive approval from the Contract Administrator prior to beginning Work.
- (b) The minimum strength of concrete in place for safe removal of soffit forms for horizontal or inclined members, as well as vertical forms shall be 20 MPa, with the added provisions that the member shall be of sufficient strength to carry safely its own weight, together with superimposed construction loads, and that the forms shall stay in place a minimum of three days unless otherwise approved by the Contract Administrator.
- (c) Field-cured test specimens, representative of the in-place concrete being stripped, may be tested to verify the concrete strength.

E21.34 Patching of Formed Surfaces

- (a) Immediately after forms have been removed, but before any repairing or surface finishing is started, the concrete surface shall be inspected by the Contract Administrator. Any repair or 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 thoroughly brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck-off slightly higher than the adjacent 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.

- (d) All objectionable fins, projections, offsets, streaks, or other surface imperfections shall be removed by approved means to the Contract Administrator's satisfaction. Cement washes of any kind shall not be used.
- (e) Concrete shall be cast against forms that will produce plane surfaces with no bulges, indentations, or protuberances other than those shown on the Drawings. The arrangement of panel joints shall be kept to a minimum. Panels containing worn edges, patches, or other defects that will impair the texture of concrete surfaces shall not be used. All fins on the concrete surfaces shall be removed.

E21.35 Hot Weather Concreting

- (a) The requirements of this section shall be applied during hot weather, i.e. air temperatures above 25°C during placing.
- (b) Concrete shall be placed at as low a temperature as possible, preferably below 15°C but not above 27°C. Aggregate stockpiles may be cooled by water sprays and sun shades.
- (c) Ice may be substituted for a portion of the mixing water, providing it has melted by the time mixing is completed.
- (d) Form and conveying equipment shall be kept as cool as possible before concreting by shading them from the sun, painting their surfaces white and/or the use of water sprays.
- (e) Sun shades and wind breaks shall be used as required during placing and finishing.
- (f) Work shall be planned so that concrete can be placed as quickly as possible to eliminate the possibility of "cold joints" from occurring at any location.
- (g) The Contract Administrator's acceptance is necessary before the Contractor may use admixtures such as retardants to delay setting, or water-reducing agents to maintain workability and strength, and these must then appear in the Mix Design Statement submitted to the Contract Administrator.
- (h) Curing shall follow immediately after the finishing operation.
- (i) When the air temperature is at or above 25°C, or when there is probability of its rising to 25°C during the placing period, facilities shall be provided for protection of the concrete in place from the effects of hot and/or drying weather conditions. Under severe drying conditions, as defined below the formwork, reinforcement, and concreting equipment shall be protected from the direct rays of the sun or cooled by fogging and evaporation.
- (j) The temperature of the concrete as placed shall be as low as practicable and in no case greater than that shown below for the indicated size of the concrete section.

Thickness of Section, m	Temperatures °C	
	Minimum	Maximum
Less than 0.3	10	27
0.3 - 1	10	27
1.2	5	25

- (k) Moderate Drying Conditions:
 - (i) When surface moisture evaporation exceeds 0.75 kg/m²/h, windbreaks shall be erected around the sides of the structural element.
- (l) Cold Weather Concreting
 - (i) 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.

(m) Severe Drying Conditions:

- (i) When surface moisture evaporation exceeds 1.0 kg/m²/h, additional measures shall be taken to prevent rapid loss of moisture from the surface of the concrete. Such additional measures shall consist of the following:
- ◆ Erecting sunshades over the concrete during finishing and placing operations.
 - ◆ Lowering the concrete temperature.
 - ◆ Applying fog spray immediately after placement and before finishing. Care shall be taken to prevent accumulation of water that may reduce the quality of the cement paste.
 - ◆ Beginning the concrete curing immediately after trowelling.

- (n) The nomograph, Figure D1, Appendix D of CSA Standard CAN/CSA A23.1-2000 shall be used to estimate surface moisture evaporation rates.

E21.36 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 (green-cut).
 - (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.

E21.37 Clean Up

- (a) The Contractor shall maintain the Sites of Work in a tidy condition and free from the accumulation of waste and debris.

QUALITY CONTROL

E21.38 Inspection

- (a) All workmanship and 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 the Work, through to final acceptance of the specified 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 which are not in accordance with the requirements of this Specification.

E21.39 Access

- (a) The Contract Administrator shall be afforded full access for the inspection and control of testing of concrete and constituent materials, both at the Site of Work and at any plant used for the production of concrete, to determine whether the concrete is being supplied in accordance with this Specification.

MATERIALS

E21.40 All materials supplied under this Specification shall be subject to testing and approval by the Contract Administrator.

E21.41 Concrete Quality

- (a) Quality control tests will be used to determine the acceptability of the concrete supplied by the Contractor.
- (b) The Contractor shall provide, without charge, the samples of concrete and the constituent materials required for quality control tests and provide such assistance and use of tools and construction equipment as is required.
- (c) The frequency and number of concrete quality control tests shall be in accordance with the requirements of CSA Standard CAN/CSA-A23.1.
- (d) Compressive strength tests on specimens cured under the same conditions as the concrete works will be made to check the strength of the in-place concrete and the adequacy of curing. Backfilling or subsequent concreting operations will not be allowed until the in-place concrete has achieved a compressive strength of 25 MPa.

E21.42 Corrective Action

- (a) If the results of the tests indicate that the concrete is not of the specified quality, the Contract Administrator shall have the right to implement additional testing, as required, to further evaluate the concrete at the Contractor's expense.
- (b) The Contractor shall, at his own expense, correct such Work or replace such materials found to be defective under this Specification in an approved manner to the satisfaction of the Contract Administrator.

E22. SUPPLYING AND PLACING REINFORCING STEEL

DESCRIPTION

E22.1 This Specification shall cover the supply, fabrication and placement of plain reinforcing steel.

E22.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all works as hereinafter specified.

MATERIALS

E22.3 General

- (a) The Contractor shall be responsible for the supply, safe storage and handling of all materials as set forth in this Specification.
- (b) 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 the latest edition of CSA Standard CAN3-A23.1, Storage of Materials, except as otherwise specified herein.

E22.4 Reinforcing Steel

- (a) All reinforcing steel shall conform to the requirements of CSA Standard G30.18, Grade 400, Billet-Steel Bars for concrete reinforcement. If, in the opinion of the Contract Administrator, any reinforcing steel provided for the concrete works exhibits flaws in manufacture or fabrication, such material shall be immediately removed from the Site and replaced with acceptable reinforcing steel.
- (b) All reinforcing steel shall be straight and free from paint, oil, mill-scale, and injurious defects. Surface seams or surface irregularities will not be cause for rejection, provided

that the minimum dimensions, cross section area, and tensile properties of a hand wire-brushed specimen are not less than the requirements of CSA Standard G30.18.

E22.5 Bar Accessories

- (a) Bar accessories shall be of a type approved by the Contract Administrator. They shall be made from a non-rusting material, and shall not stain, blemish, or spall the concreted surface for the life of the concrete.
- (b) Bar accessories shall include bar chairs, spacers, clips, wire ties, wire (18 gauge minimum), or other similar devices that may be approved by the Contract Administrator.

E22.6 Reinforcing Steel Shop Drawings

- (a) The Contractor will be responsible to produce the detailed drawings for the fabrication and placement of the reinforcing steel. Submit shop drawings for the supply and placement of reinforcing steel. Shop drawings shall consist of bar bending details, lists, placing drawings and mass tabulations. On placing drawings, indicate sizes, spacing, location, and quantities of reinforcement. Prepare drawings in accordance with ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures. Detail lap lengths and bar development lengths to CAN3-A23.3, unless otherwise indicated. Provide drawing in AutoCAD or other suitable electronic format.

CONSTRUCTION METHODS

E22.7 Fabrication of Reinforcing Steel

- (a) Reinforcing steel shall be fabricated in accordance with CSA Standard G30.18 to the lengths and shapes as shown on the Drawings.

E22.8 Placing of Reinforcing Steel

- (a) Reinforcing steel shall be placed accurately in the positions shown on the Drawings and shall be retained in such positions by means of a sufficient number of bar accessories to that the bars shall not be moved out of alignment during or after the depositing of concrete. The Contractor's decision in this matter shall be final.
- (b) Reinforcing steel shall be free of all foreign material in order to ensure a positive bond between the concrete and steel. The Contractor shall also remove any dry concrete, which may have been deposited on the steel from previous concrete placement, before additional concrete may be placed. Intersecting bars shall be tied positively at each intersection.
- (c) Splices in reinforcing steel shall be made only where indicated on the Drawings. Prior approval of the Contract Administrator shall be obtained where other splices are to be made. Welded splices shall conform to CSA Standard W186, and are subject to prior written approval of the Contract Administrator.
- (d) Reinforcing steel shall not be straightened or rebent in a manner that will injure the metal. Bars with bends not shown on the Drawings shall not be used. Heating of reinforcing steel will not be permitted without the prior approval of the Contract Administrator. A minimum of twenty-four (24) hours advance notice shall be given to the Contract Administrator prior to placing of any concrete to allow for inspection of the reinforcement.

QUALITY CONTROL

E22.9 Inspection

- (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 specified 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.

E22.10 Access

- (a) The Contract Administrator shall be afforded full access for the inspection and quality control testing of reinforcing steel; both at the Site of Work and at any plant used for fabrication of the reinforcing steel, to determine whether the reinforcing steel is being supplied in accordance with this Specification.

E22.11 Quality Testing

- (a) Quality control testing will be used to determine the acceptability of the reinforcing steel supplied by the Contractor.
- (b) The Contractor shall provide, without charge, the samples of reinforcing steel required for quality control tests and provide such assistance and use of tools and construction equipment, as is required.

E23. CAST-IN-PLACE PILE FOUNDATIONS

DESCRIPTION

- E23.1 The Work covered under this Item shall include all concreting operations related to construction of cast-in-place concrete pile foundations in accordance with this Specification and as shown on the Drawings.
- E23.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

MATERIALS

- E23.3 As per E21: Structural Concrete.

CONSTRUCTION METHODS

- E23.4 As per E21: Structural Concrete.

QUALITY CONTROL

- E23.5 As per E21: Structural Concrete.

MEASUREMENT AND PAYMENT

- E23.6 Construction of cast-in-place concrete base foundations including supply and installation of anchor bolts and steel template will not be measured and will be paid for at the Contract Lump Sum Price per base per Site for the "Items of Work" listed here below for concrete bases constructed in accordance with this Specification and accepted by the Contract Administrator. All sawcutting, formwork, supply and installation of reinforcing steel, dowels, structural concrete, anchor bolts and steel template shall be included in the measurement and payment as listed below.

- (a) Items of Work:
 - Cast-in-Place Concrete Base Foundations
 - (i) Concrete Base for Bus Stop Flag

E24. PARKING FENCE

DESCRIPTION

- E24.1 This specification shall cover:
- (a) The supply and installation of a post and rail fencing as shown on the drawings and as specified herein including compacted granular foundation.
 - (b) The removal of the wood fence in the transit facilities parking lot.

MATERIALS

- E24.2 Posts shall be WF Beam A 572 – 50 203 x 133 Hot Dipped Galvanized
- E24.3 Lumber identification by a grade stamp of an agent certified by the Canadian Lumber Accreditation Board.
- E24.4 Pressure treated wood is to be guaranteed for 10 years against rot, decay, insect attack, splitting, warping, or breaking. Fences are to be guaranteed against defects in materials and workmanship for a period of 12 months from the date of Substantial Performance of the Contract. The Contractor is not responsible for acceptable wear through usage or acts of vandalism.
- E24.5 Wood: all wood for fences shall be no. 2 or better wolmanized pressure treated pine, spruce or fir; no wane, bark, checking, or splitting permitted. Colour as specified.
- E24.6 Hardware: all hardware is as follows:
- (a) Nails, spikes, and screws: hot dipped galvanized, size indicted on drawings, or specified.
 - (b) Bolts: galvanized; 20 mm in diameter unless otherwise specified, complete with nuts and washers.
 - (c) Galvanizing: to CSA G164-M1981; use galvanized
 - (d) Joist hangers: min. 1.0 mm thick sheet steel galvanized coating.
 - (e) Fasteners indicated on drawing or specified by the Owner (no substitutes).
- E24.7 Wood preservative: Surface applied wood preservative; coloured, or copper napthenate or 5% pentachlorophenol solution, water repellent preservative.
- E24.8 Granular material: crushed limestone, 10 mm diameter containing down size material with degree of fines.

CONSTRUCTION METHODS

- E24.9 Post and Rail Fence Installation
- (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 specified 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 which are not in accordance with the requirements of this Specification.
 - (b) The Contractor shall, at his own expense, correct such work or replace such materials found to be defective under this Specification in an approved manner to the satisfaction of the Contract Administrator.
 - (c) The Contract Administrator shall be afforded full access for the inspection and control testing of materials, both at the Site and at any plant or borrow pit used for the supply of

the materials to determine whether the material is being supplied in accordance with this Specification.

- (d) All lumber shall be neatly cut for a proper fit. All cuts shall be treated with preservation before being secured.
- (e) Fences to be constructed to the lines, grades, and specifications as shown in the drawings or as specified herein. Establish final grades and elevations for fences after regarding of Site. In the event that asphalt paving is to be carried on in the location of the fencing, the paving shall precede the fence construction.
- (f) The Contractor shall stake out the post locations as located on the Drawings. Prior to drilling holes, all underground services shall be protected. Fence support posts shall be set true in line and elevation.
- (g) Backfill hole excavations with crushed limestone, compacting the material by tamping with a blunt pole or rod. Material shall be compacted in layers not exceeding 150 mm. Top of fill to be overfilled so that the fill has convex appearance, sloping away from the post.
- (h) All posts shall be even and neat and shall provide a solid finished product suitable for the purposes intended.
- (i) Install spanning members with crown edge up.
- (j) Treat all cut, trimmed, or drilled with liberal application of preservative before installation. Apply preservative by dipping or by brushing to completely saturate and maintain wet film on surface for minimum 3 minute soak.

E24.10 Wood Fence Removal

- (a) Remove all objects designated by the Contract Administrator for removal, including any electrical amenities and concrete bases visible or not. Fill and re-grade any holes created from the removal of the concrete bases using an acceptable fill as approved by the Contract Administrator.
- (b) All debris is to be removed from the Site and disposed of or salvaged by the Contractor.

MEASUREMENT AND PAYMENT

- E24.11 The supply and installation of post and rail fence will be measured on a length basis and paid for at the Contract Unit Price per lineal meter for "Parking Fence". The length to be paid for will be the total lineal meters of parking fence supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.
- E24.12 The removal of wood fence in the transit facilities parking lot will be measured on a length basis and paid for at the Contract Unit Price per lineal meter for "Wood Fence Removal". The length to be paid for will be the total lineal meters of wood fence removed in accordance with this specification, accepted and measured by the Contract Administrator.

E25. CAST-IN-PLACE CONCRETE TUNNEL CATCHBASINS

DESCRIPTION

- E25.1 The Work covered under this Item shall include all concreting operations related to construction of cast-in-place concrete tunnel catchbasins in accordance with this Specification and as shown on the Drawings including the installation of the frame and cover.
- E25.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

MATERIALS

E25.3 As per E21: Structural Concrete.

CONSTRUCTION METHODS

E25.4 As per E21: Structural Concrete.

QUALITY CONTROL

E25.5 As per E21: Structural Concrete.

MEASUREMENT AND PAYMENT

E25.6 The supply and installation of cast in place concrete tunnel catchbasins will be measured on a unit basis and paid for at the Contract Unit Price per item for "Cast In Place Concrete Tunnel Catchbasin". The amount to be paid for will be the total number of catchbasins, including frame and covers, supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E26. HYDRO EXCAVATION

DESCRIPTION

E26.1 General

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

EQUIPMENT

E26.2 Hydro Excavation unit shall be capable of maintaining a minimum working pressure of 10,000 psi, at a rate of flow of 10 to 12 gallons per minute. Unit should be adjustable, so as to provide adequate pressure to remove earthen material identified by the Contract Administrator.

E26.3 Spray head shall be equipped with a rotating type nozzle, in order to provide a wider path of cut.

CONSTRUCTION METHODS

E26.4 Hydro-removal of earthen material

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

E26.5 Recovery of excavated material

- (a) The recovery of excavated material shall be done using vacuum type method, or other type method as approved by the Contract Administrator.
- (b) The recovery of material shall follow immediately behind the excavation, to avoid excavated areas from filling with excavated material.
- (c) The use of mechanical sweepers will not be allowed.
- (d) Dispose of material in accordance with Section 3.4 of CW 1130.

E26.6 Back fill of hydro excavated hole

- (a) The Contractor shall be responsible for the backfill of the hydro excavated hole upon the completion of the Work described herein, to the approval of the Contract Administrator.

MEASUREMENT AND PAYMENT

E26.7 Hydro Excavation

- (a) Hydro Excavation of earthen material will be measured on an hourly basis and paid for at the Contract Unit Price per hour for "Hydro Excavation". The hours to be paid for will be the total number of hours of Hydro Excavation in accordance with this specification, accepted and measured by the Contract Administrator. Travel to and from the Site will not be accounted for in the payment of this item.

E27. EARTHWORK AND ROUGH GRADING

E27.1 This specification is supplemental to CW 3110 and CW 3170. The Work of this section comprises the furnishing of all labour, equipment and materials required to complete the excavation and related Work including, but not necessarily confined to, the following:

- (a) Excavation, removals, disposal, subgrade compaction and rough grading of the existing Site for the construction sodded and seeded areas, planting beds, mulch beds, berms, swales, etc. to the design requirements noted on the Drawings, approved on Site by the Contract Administrator, less the appropriate surface finish allowance.
- (b) Stockpile suitable, approved material on Site for reuse (clean topsoil, clean earth fill and gravel fill). Remove and dispose of unsuitable material.
- (c) Earthwork and Grading of the existing Site to the design elevations shown on the Drawings, less the appropriate surface finish allowance.
- (d) Earthwork and Grading of the existing Site (cut and fill including compaction of subgrade and fill material) to ensure positive drainage in all swales and adjacent sodded/seeded areas and planting beds.
- (e) Supply and install imported fill in areas as required to create berms as shown on the drawings and ensure positive drainage.

MATERIALS

E27.2 All fill materials shall conform to CW 3170.

CONSTRUCTION METHODS

E27.3 The Contractor shall construct the Site within the limits indicated to the design elevations and gradients noted on the Drawings, less the appropriate surface treatment depths specified and shall excavate, remove and dispose of all unsuitable materials of whatever nature encountered.

E27.4 The Contractor shall construct all sub-grades in accordance with Specification CW 3110, including removal of unsuitable excavated material and surplus materials.

E27.5 The Contractor shall restrict his activities strictly to within the limits of the Work, unless receiving prior written approval from the Contract Administrator. The Contractor shall take all precautions to prevent damage to traffic structures, pole lines, existing trees, Site services and adjacent property and he shall be liable for any damages occurring in the performance of this Work.

E27.6 The Contractor shall examine the Site and make themselves familiar with the existing conditions and the nature of the Work to be done.

E27.7 Prevent damage to surface or underground utility lines which are to remain. Make good any damage.

E27.8 The Contractor shall excavate to the design grades shown less the appropriate allowance for surface treatment and shall excavate, remove and dispose of all unsuitable materials of whatever nature encountered.

E27.9 Excavated or graded materials to be approved before use as fill for grading Work. Protect such approved material from contamination. Stockpile in approved locations on-site. Protection and stockpiling are incidental to unit prices bid for excavation, removals and rough grading.

- E27.10 The Contractor shall ensure that upon completion of the earthwork and grading operations the Site is left in a neat condition free from debris, etc. for approval by the Contract Administrator prior to placing base courses and clean fill.
- E27.11 Except for drainage swales, berms and embankments indicated, the design gradient for all other areas shall be considered to be straight grade between the design elevations shown. Changes in grade at swales, berms, embankments and field shall be gently contoured as directed by the Contract Administrator to provide future ease of grass mowing operation.
- E27.12 Construction to the new design grades shall be accomplished by the placement of clean fill in areas as indicated on the Drawings.
- E27.13 Areas of Fill
- (a) Fill low areas in sodded/planting bed areas with imported clean earth fill suitable for plant growth free from roots, muskeg, organic or cohesive matter, building debris, waste materials, rubble, rubbish, frozen portions, soluble materials and rocks larger than 25mm (1") in diameter and capable of sustaining plant and seed growth. Compact to 95% S. P. D. in 150mm (6") lifts to 1000mm below finish grade for all planting beds and 900mm below finish grade for sodded and seeded areas noted on the Drawings. Where depth of planting soil is not noted on drawings for sodded and seeded areas place earth fill to 150mm below finish grade.
 - (b) Construct berms and sloped areas using imported clean earth fill suitable for plant growth free from roots, muskeg, organic or cohesive matter, building debris, waste materials, rubble, rubbish, frozen portions, soluble materials and rocks larger than 25mm (1") in diameter and capable of sustaining plant and seed growth. Compact to 95% S. P. D. in 150mm (6") lifts to 1000mm below finish grade for all planting beds and 900mm below finish grade for sodded and seeded areas noted on the Drawings. Where depth of planting soil is not noted on drawings for sodded and seeded areas place earth fill to 150mm below finish grade.
 - (c) Prior to placing fill over existing ground, scarify surface to depth of 150mm. Maintain fill and existing surface at approximately the same moisture content to facilitate bonding.
 - (d) No direct payment will be made for placing and grading of existing fill as all costs for this Work shall be included in the lump sum bid for excavation, removals and rough grading within the limit of the Work.
- E27.14 Compaction shall include the use of sheep's foot or other suitable compaction equipment as approved by the Contract Administrator to achieve a minimum compaction of 98% Standard Proctor Density below all paved areas and rock areas, and 95% Standard Proctor Density in all other areas disturbed under this Contract.
- E27.15 The Contractor shall construct the sub-grade surface to the following depths below the grades shown on the Drawings for each area:
- (a) Planting bed: 1150 mm
 - (b) Mulch bed with existing trees: 100mm
 - (c) Planting area with trees: 1050 mm
 - (d) Sodded and seeded areas with trees: 1050 mm
 - (e) Sodded areas: 150 mm
 - (f) Seeded areas: 300 mm
- E27.16 Following earth moving, rough grading and compaction the Work areas shall be fine graded to provide a maximum deviation of 50mm in 10 metres from the design grade with no low areas to hold water. The finished surface of all disturbed areas shall be dragged and smoothed in such a manner that there are no loose soil particles greater than 50mm in maximum dimensions. Fine grading is incidental to the unit prices bid for each item listed in the schedule of prices.

E27.17 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.

MEASUREMENT AND PAYMENT

E27.18 Rough grading for sodded and seeded areas will be measured on an area basis and paid for at the Contract Unit Price per square meter for "Rough Grading for Sodded and Seeded Areas". The area to be paid for will be the total square meters rough graded in accordance with this specification, accepted and measured by the Contract Administrator. No payment will be made for material removed outside of the limits of excavation as established by the Contract Administrator.

E27.19 No measurement or payment will be made for filling holes/low areas left by excavation and removals operations as this item shall be incidental to this specification.

E27.20 No measurement will be made for the excavation or compaction of the subgrade in the areas described within this specification as this shall be incidental to this work.

E27.21 No measurement or payment will be made for disposing of surplus fill and unsuitable material as this shall be incidental to this specification.

E28. PLANTING BED PREPARATION

DESCRIPTION

E28.1 The following list generally describes the scope of this Section:

- (a) Cultivate subsoil;
- (b) Supply and install drainage course and drainage pipe;
- (c) Supply and install planting soil mixture in planting beds;
- (d) Supply and install wood chip mulch and filter fabric.

E28.2 Submit to the Contract Administrator samples of the following materials:

- (a) Planting Soil Mixture: 1 kg
- (b) Wood chip mulch: 500g
- (c) Geotextile

E28.3 Delivery and Storage

E28.3.1 Deliver and store fertilizer in waterproof bags showing weight, analysis and name of manufacturer.

MATERIALS

E28.4 Planting Soil: For mix imported topsoil with 20% peatmoss loose by volume, and 5% sand loose by volume. Incorporate bonemeal into planting soil at rate of 5 lbs /cu.yd. of soil mixture. Planting soil items to be comprised as follows:

E28.5 Peatmoss: horticultural grade Class "A" decomposed plant material, fairly elastic and homogeneous. Free of decomposed colloidal residue, weed, sulphur and iron. To have pH value of 5.9 to 7.0, 60% organic matter by weight, moisture content not exceeding 15% and water absorption capacity of not less than 300% by weight on oven dry basis.

E28.6 Bonemeal: shall be raw bonemeal, finely ground with a minimum analysis of 3% nitrogen and 20% phosphoric acid.

- E28.7 Imported topsoil: natural, fertile, agricultural soil typical of locality, capable of sustaining vigorous plant growth, from well drained Site that is free of flooding, not in frozen or muddy condition, not less than 6% organic matter to a maximum 25% organic matter by volume, and pH value of 5.9 to 7.0. Free from subsoil, slag or clay, stones, lumps, live plants and their roots, sticks, crabgrass, couchgrass, noxious weeds and foreign matter.
- E28.8 Sand: hard, granular natural beach sand, washed free of impurities, chemical or organic matter.
- E28.9 Fertilizer: commercial type with 50% of the elements derived from organic sources.
- E28.10 Drainage fabric as per CW 3120.
- E28.11 Drainage material as per CW 3120.
- E28.12 Drainage pipe as per CW 3120.
- E28.13 Wood chip mulch: varying in size from 15-25 mm and 5-20 mm thick, from coniferous trees.

CONSTRUCTION METHODS

- E28.14 Remove debris, broken roots, branches, stones in excess of 50mm diameter and other deleterious materials. Remove subsoil that has been contaminated with oil, gasoline or calcium chloride. Dispose of removed materials as directed.
- E28.15 Excavate bed to a depth of 1150mm as per details on the Drawings.
- E28.16 Place drainage pipe, drainage fabric and drainage material as per the Drawings. Connect subdrain to catchbasins as shown on the drawings. All Work related to subdrain for planting beds is incidental to the unit prices bid for shrub bed preparation.
- E28.17 Do not spread planting soil mixture until Contract Administrator has inspected drainage course.
- E28.18 Spread planting soil mixture with adequate moisture in uniform layers during dry weather over approved, dry, unfrozen sub-grade, where planting is indicated.
- E28.19 Bring planting soil mixture up to 100 mm below finished grade in beds.
- E28.20 Remove stones, roots, grass, weeds, construction materials, debris and foreign non-organic objects from soil mixture.
- E28.21 Spread fertilizer at manufacturer's recommended rate of application. Mix fertilizer thoroughly into upper 50mm of planting soil.
- E28.22 Fine grade entire planting soil area. Eliminate rough spots.
- E28.23 Compact planting soil to leave surface smooth, uniform, firm against deep foot printing, with a fine, loose texture. Tolerance: plus or minus 15mm of design grade.
- E28.24 Supply and install 100mm wood chip mulch in beds.

MEASUREMENT AND PAYMENT

- E28.25 Supply and install planting bed shall be measured on an area basis and paid for at the Contract Unit Price per square metre for "Supply and Install Planting Bed" which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification acceptable to the Contract Administrator.
- E28.26 Supply and install mulch bed shall be measured on an area basis and paid for at the Contract Unit Price per square metre for "Supply and Install Mulch Bed" which price shall be payment in full for supply of all materials and performing all operations herein described and for all other

items incidental to the Work included in this Specification acceptable to the Contract Administrator.

- E28.27 Supply and install planting soil in sodded and seeded areas with trees shall be measured on an area basis and paid for at the Contract Unit Price per square metre for "Supply and Install Planting Soil" which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification acceptable to the Contract Administrator.

E29. PLANT MATERIAL

DESCRIPTION

E29.1 The following list generally describes the scope of this section:

- (a) Supply and planting of trees and shrubs;
- (b) Maintenance to date of substantial performance;
- (c) Warranty for two full years.

E29.2 General

E29.2.1 Obtain approval of plant material at source.

E29.2.2 Notify Contract Administrator of source of material at least 7 days in advance of shipment. No Work under this Section is to proceed without approval.

E29.2.3 Acceptance of plant material at source does not prevent rejection at Site prior to or after planting operations.

E29.2.4 Source of all plant material to be from an area within the same hardiness zone and soil conditions as Winnipeg.

E29.3 Shipment and Pre-Planting Care

E29.3.1 Co-ordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting. Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of planting stock with rope or wire which would damage bark, break branches or destroy natural shape of plant. Give full support to root ball of large trees during lifting.

E29.3.2 Cover plant foliage with tarpaulin, and protect bare roots by means of dampened straw, peatmoss, sawdust or other acceptable material to prevent loss of moisture during transit and storage.

E29.3.3 Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 50 mm diameter with wound dressing.

E29.3.4 Keep roots moist and protected from sun and wind. Heel-in shrubs, which cannot be planted immediately, in shaded areas, and water well.

E29.4 Water

E29.4.1 Water should be potable and free of minerals, which may be detrimental to plant growth.

E29.5 Anti-Desiccant

E29.5.1 Anti-desiccant should be wax-like emulsion to provide film over plant surface reducing evaporation but permeable enough to permit transpiration.

E29.6 Wound Dressing

E29.6.1 Wound dressing should be horticulturally accepted non-toxic, non-hardening emulsion.

E29.7 Plant Material

- E29.7.1 Quality and Source: Comply with City of Winnipeg tree planting guidelines, referring to size and development of plant material and root ball. All plant material to be approved by City and Contract Administrator at source.
- E29.7.2 Measure plants when branches are in their natural position. Height and spread dimensions refer to main body of plant and not from branch tip to branch tip. Use trees of No. 1 grade.
- E29.7.3 Additional plant material qualifications:
- (a) Use perennials and plant plugs with strong fibrous root system free of disease, insects, defects or injuries and structurally sound. Plant must have been root pruned regularly, but not later than one growing season prior to arrival on Site.
- E29.8 Cold Storage
- E29.8.1 Approval required for plant material, which has been held in cold storage.
- E29.9 Container – Grown Stock
- E29.9.1 Acceptable if containers large enough for root development. Shrubs and vines must have grown in container for minimum of one growing season but not longer than two. Root system must be able to "hold" soil when removed from container. Plants that have become root bound are not acceptable. Container stock must have been fertilized with slow releasing fertilizer.
- E29.10 Substitutions
- E29.10.1 Substitutions to plant material as indicated on plantings plan are not permitted unless written approval has been obtained as to type, variety and size prior to award of Contract. Plant substitutions must be similar species and of equal size to those originally specified.
- E29.11 Root balls
- E29.11.1 Deciduous trees in excess of 3 m height must have been dug with large firm ball. Root balls must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light sandy or rocky soil. Lift root ball from hole, place in wire basket designed for purpose and line with burlap. Secure root balls with burlap, heavy twine and wire basket. Protect root balls against sudden changes in temperature and exposure to heavy rainfall. Take care not to injure trunk of tree with wire basket ties or rope.
- E29.11.2 Tree spade material shall not be accepted, unless dug in field and secured as above.
- E29.12 Workmanship
- E29.12.1 Stake out location of trees and shrubs as per the Construction Drawings. Obtain approval by City and Contract Administrator prior to excavating.
- E29.12.2 Apply anti-desiccant in accordance with material manufacturer's instructions only as required.
- E29.12.3 Co-ordinate operations. Keep Site clean and planting holes drained. Immediately remove soil or debris spilled onto pavement.
- E29.13 Planting Time
- E29.13.1 Plant deciduous plant material during dormant period, before buds have broken. Plant material noted for spring planting only, must be planted in dormant period.
- E29.13.2 When permission has been obtained to plant materials after buds have broken, spray plants with anti-desiccant to slow down transpiration prior to transplanting.
- E29.13.3 When permission has been obtained, shrubs and perennials growing in containers may be planted throughout growing season.
- E29.13.4 Plant only under conditions that are conducive to health and physical conditions of plants.

E29.13.5 Provide planting schedule. Executing planting operations over long period using limited crew will not be accepted.

E29.14 Excavations

E29.14.1 Prepare planting areas as shown on the Drawings.

E29.14.2 Provide drainage for planting holes in heavy soil if natural drainage does not exist. Have method approved.

E29.14.3 Protect bottom of excavations against freezing.

E29.14.4 Remove water, which enters excavations prior to planting. Ensure source of water is not ground water.

E29.15 Planting

E29.15.1 Scarify sides of planting hole to depth of 150 mm where tree is planted in isolated tree pit.

E29.15.2 Plant trees, shrubs and perennials vertically with roots placed straight out in hole. Orient plant material to give best appearance in relation to structure, roads and walks.

E29.15.3 Place plant material to depth equal to depth they were originally growing in nursery. Allow for soil settlement in planting.

E29.15.4 With balled and burlapped roots balls, loosen burlap and cut away minimum top 1/2 without disturbing root ball. Cut vertical slits in remaining burlap around root ball at 250mm intervals. Remove all rope, string, or other ties from around trunk. Do not pull burlap or rope from under root ball. With container stock, remove entire container without disturbing root ball. Non bio-degradable wrappings must be removed including wire baskets.

E29.15.5 Tamp planting soil around root system in layers of 150mm eliminating air voids. Frozen or saturated planting soil is unacceptable. When 2/3 of planting soil has been placed, fill hole with water. After water has completely penetrated into soil, complete backfilling.

E29.15.6 Build 100 mm deep saucer around outer edge of hole to assist with maintenance watering. Install 100mm depth wood chip mulch in saucer as shown on drawings.

E29.15.7 When planting is completed, give surface of planting saucer dressing of organic 10-6-4 fertilizer at rate of 12 kg/100 m for shrub beds or 40 to 50 g/mm of calliper for trees. Mix fertilizer thoroughly with top layer of planting soil and water in well.

E29.16 Pruning

E29.16.1 Prune trees and shrubs after planting only as required to remove broken diseased or dead branches. Employ clean sharp tools and make cuts flush with main branch, smooth and sloping as to prevent accumulation of water.

E29.17 Maintenance

E29.17.1 After completion of planting operation to the satisfaction of the Contract Administrator and City of Winnipeg, the Contractor shall be responsible for the maintenance of the plant material until date of Substantial Performance and commencement of two year warranty.

E29.17.2 Replace any dead or damaged plant material during the maintenance period, including replacement of vandalized material.

E29.17.3 Water sufficiently to maintain optimum growing conditions. Ensure adequate moisture in root zone at freeze-up.

E29.17.4 The Contractor shall provide all necessary equipment, including: tractors, mowers, hand mowers, trimmers, fertilizer spreaders, pruning tools, hoses, water meters, and any other items necessary for the maintenance of the plant material indicated in this Specification.

E29.17.5 Remove all weeds and debris from mulch beds, planting beds and tree wells on a weekly basis.

E29.17.6 Turn and top up mulch in beds and tree wells each spring and prior to start of extended maintenance.

E29.18 Personnel

E29.18.1 The Contractor shall provide all necessary personnel for the ongoing maintenance operations.

E29.18.2 Personnel should have at least one year of experience in landscape maintenance and should be under the direction of a foreman, in all cases, with not less than five years of experience with similar maintenance operations.

E29.19 Maintenance Methods

E29.19.1 Watering

- (a) Trees shall be watered twice weekly, or during the summer, if temperatures are fairly high and there has been no rainfall, water approximately once a week.
- (b) To determine the need for watering, make a soil test weekly with a one-inch auger. Take a test sample from both the planting soil and from the root ball by drilling to a minimum depth of 600 mm. The soil shall contain enough moisture to hold together when compressed in the hand, but not be muddy.

E29.19.2 Fertilizing

- (a) Because of the specialized nature of such operations, fertilizing is to be done by a qualified local arborist.
- (b) Fertilize in the fall over the surface of the ground surrounding the plants, then soak the area thoroughly, use 10-6-4 analysis fertilizer spreading a maximum of 0.13 kg per square metre.

E29.19.3 Spraying

- (a) Spray trees to control insect pests and diseases. Use horticulturally recommended compounds specific for the problem to be contained.

E29.19.4 Insects and Diseases

- (a) Spray plants to combat pests and diseases. Do not use DDT or sprays prohibited by Agriculture Canada.

MEASUREMENT AND PAYMENT

E29.20 Supply and Installation of Plant Material will be measured on a unit basis and paid for at the Contract Unit Price for each type and size specified for "Items of Work", 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 acceptable to the Contract Administrator as listed below:

- (a) Items of Work:
 - i) SILVER MAPLE 75-90mm cal
 - ii) SILVER MAPLE 40mm cal
 - iii) OHIO BUCKEYE 40mm cal
 - iv) PRAIRIE HORIZON ALDER 40mm cal
 - v) COMMON HACKBERRY 40mm cal
 - vi) MANCHURIAN ASH 75-90mm cal
 - vii) MANCHURIAN ASH 40mm cal
 - viii) BUTTERNUT 40mm cal
 - ix) BALSAM POPLAR 75-90mm cal
 - x) BALSAM POPLAR 40mm cal
 - xi) TREMBLING ASPEN 75-90mm cal

- xii) TREMBLING ASPEN 40mm cal
- xiii) AMERICAN BASSWOOD 75-90mm cal
- xiv) AMERICAN BASSWOOD 40mm cal
- xv) GLENLEVEN LINDEN 75-90mm cal
- xvi) GLENLEVEN LINDEN 40mm cal
- xvii) AMERICAN ELM 75-90mm cal
- xviii) AMERICAN ELM 40mm cal
- xix) BRANDON ELM 75-90mm cal
- xx) BRANDON ELM 40mm cal
- xxi) DISCOVERY ELM 75-90mm cal
- xxii) DISCOVERY ELM 40mm cal
- xxiii) AMUR MAPLE 60-75mm cal
- xxiv) AMUR MAPLE 40mm cal
- xxv) SNOWBIRD HAWTHORN 60-75mm cal
- xxvi) SNOWBIRD HAWTHORN 40mm cal
- xxvii) SPRING SNOW CRABAPPLE 60-75mm cal
- xxviii) SPRING SNOW CRABAPPLE 40mm cal
- xxix) HOP HORNBEAM 60-75mm cal
- xxx) HOP HORNBEAM 40mm cal
- xxxi) PINCHERRY 40mm cal
- xxxii) CHOKECHERRY 40mm cal
- xxxiii) URE PEAR 60-75mm cal
- xxxiv) URE PEAR 40mm cal
- xxxv) AMERICAN LARCH 1.8m ht
- xxxvi) AMERICAN LARCH 1.0m ht
- xxxvii) WHITE SPRUCE 1.8m ht
- xxxviii) WHITE SPRUCE 1.0m ht
- xxxix) COLORADO SPRUCE 1.8m ht
- xxxx) COLORADO SPRUCE 1.0m ht

E30. EXTENDED MAINTENANCE

DESCRIPTION

E30.1 This Specification shall deal with the maintenance of the trees, mulch beds, and perennials for Two (2) calendar years after the date of the Substantial Performance.

E30.2 Materials and Personnel

E30.2.1 The Contractor shall provide all necessary equipment, including: tractors, trimmers, fertilizer spreaders, pruning tools, water trucks, hoses, water meters, and any other items necessary for the maintenance of the area indicated in this Specification.

E30.2.2 The Contractor shall provide all necessary personnel for the ongoing maintenance operations.

E30.3 Work Included

E30.3.1 The following areas shall be part of the maintenance jurisdiction:

- (a) The trees, shrubs perennials and vines as indicated on the Drawings.
- (b) Mulch beds as indicated on the Drawings.
- (c) All sodded areas as indicated on the Drawings.

E30.4 Maintenance of Trees, Shrubs and Perennials

E30.4.1 Watering

- (a) All plant material shall be watered bi-weekly, or during the summer, if temperatures are fairly high and there has been no rainfall, water approximately once a week. Where irrigation is not available this should be executed by leaving a hose, with a gentle rate of flow, running into the saucer of the root ball for about one hour.
- (b) To determine the need for watering, make a soil test weekly with a one-inch auger. Take a test sample from both the planting soil and from the root ball by drilling to a minimum depth of 600 mm. The soil shall contain enough moisture to hold together when compressed in the hand, but shall not be muddy.

E30.4.2 Fertilizing and pest control

- (a) Fertilizing, Pruning and Spraying Deciduous Trees and Shrubs. Because of the specialized nature of such operations, this should be done by a qualified local arborist.
- (b) Fertilize in the fall over the surface of the ground surrounding the plants, then soak the area thoroughly. Use 10-6-4 analysis fertilizer spreading a maximum of 0.13 kg per square metre.
- (c) Spray to control insect pests and diseases. Use horticulturally recommended compounds specific for the problem to be contained.

E30.4.3 Weeding

- (a) Remove all weeds in tree wells planting beds and mulch beds by hand on a weekly basis. Do not use chemical weed killer.
- (b) Remove all debris from beds, including weeds, and dispose of off-site in a legal manor.

E30.4.4 Other Maintenance

- (a) Tighten, or remove, turnbuckles or guy wires for trees as required or directed by the Contract Administrator.
- (b) Straighten trees as required and directed by the Contract Administrator.

E30.4.5 The Contractor shall agree and guarantee to replace and replant any nursery stock found dead or in poor condition during and at the completion of the maintenance period. All plant material to be replaced and maintained for a minimum of 30 days prior to end of maintenance period. "Poor Condition" shall be interpreted as meaning nursery stock in which branches are dead or dying, or have not shown satisfactory growth of leaves. All replacements shall be of same size and species, as specified.

E30.4.6 Upon the end of the required maintenance period, a Site inspection shall be held. If at this time, all material and Works is satisfactory the Contract for maintenance and warranty shall be terminated. If materials and Works are found unacceptable the warranty shall be extended by 30 days for a follow up inspection. Extension of warranty will continue in 30 day increments for inspection until all Work and material are satisfactory.

E30.5 Maintenance of Sod

E30.5.1 Sod maintenance as per CW 3510.

MEASUREMENT AND PAYMENT

E30.5.2 Extended Maintenance will be measured on a per year lump sum basis in accordance with this Specification and accepted by the Contract Administrator. Extended Maintenance will be paid for each year at the Contract per Year Lump Sum Price for "Extended Two Year Maintenance"; which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification.

E31. TOPSOIL AND FINISH GRADING

DESCRIPTION

E31.1 Further to CW3540 this section shall cover the supply and placement of topsoil for areas of sodding and seeding.

MATERIALS

E31.2 Topsoil for sod as per CW3540.

E31.3 Soil in areas of sod and seed with trees to be planting soil to minimum 900mm depth. Soil to be as per planting bed preparation.

E31.4 Topsoil for top 300mm of seed areas to be weed free topsoil as supplied and installed by Native Plant Solutions. Contact Glen Koblun 953-8206.

E31.5 Installation

E31.5.1 Installation of topsoil for sod as per CW3540.

E31.5.2 Installation of to 300mm of topsoil for seed areas to be by Native Plant Solutions.

MEASUREMENT AND PAYMENT

E31.6 There shall be no separate measurement or payment for supply and installation of topsoil in sodded areas.

E31.7 Supply and installation of weed free planting soil shall be measured on a volume basis and paid at the Contract unit price per cubic metre for "Supply and Install Weed Free Soil" which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification acceptable to the Contract Administrator.

E32. SODDING

E32.1 All Work to be to CW 3510.

MEASUREMENT AND PAYMENT

E32.2 Sodding will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Supply and Install Sod", measured as specified herein, which price shall be payment in full for completing all operations herein described and all other items incidental to the Work included in this Specification acceptable to the Contract Administrator.

E33. ESTABLISHMENT OF SEEDED AREAS

DESCRIPTION

E33.1 This Specification will cover all work and materials required to establish seeded areas.

E33.2 Native seed areas to be constructed using Native Plant solutions for all materials and labour required for the establishment of native turf grass and native tall grass prairie. Contact: Glen Koblun 953-8206.

MEASUREMENT AND PAYMENT

E33.3 Establishment of seeded areas will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Supply and Install Native Seed", measured as specified herein,

which price shall be payment in full for completing all operations herein described and all other items incidental to the Work included in this Specification acceptable to the Contract Administrator.

E34. LANDSCAPE ROCK

E34.1 Scope of Work

E34.1.1 The following list generally describes the scope of this Section:

- (a) Supply and install rough field stone rock on geotextile fabric with limestone fines infill.

E34.2 Samples

E34.2.1 Submit to the Contract Administrator samples of the following materials:

- (a) Rock: 1 -350mm-450mm O.D.
- (b) Geotextile: 1 sq.m

MATERIALS

E34.3 Limestone and granite rock to be from a Manitoba quarry, colour to be approved by Contract Administrator. Size range to be:

- (a) 300mm-450mm O.D. – 50%
- (b) 550mm-600mm O.D. – 40%
- (c) 650mm-800mm O.D. – 10%

CONSTRUCTION METHODS

E34.4 Verify grades of compacted subgrade (to 95% SPD) and adjacent features for conformity with existing grades before placing boulder.

E34.5 Remove and dispose of unsuitable subgrade material as directed by Contact Administrator.

E34.6 Supply and installation of geotextile as per the Drawings. The cost to supply and install geotextile is incidental to the Work in this section.

E34.7 Place landscape rock in locations as shown on the Drawings and directed on-site by project landscape architect.

E34.8 Place rock as per the drawings and backfill with limestone fines.

MEASUREMENT AND PAYMENT

E34.9 Landscape rock shall be measured on a volume basis and paid for at the Contract Unit Price per cubic metre for "Supply and Install Landscape Rock", 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 acceptable to the Contract Administrator.

E35. SITE FURNITURE

DESCRIPTION

E35.1 This specification covers the supply and installation of:

E35.2 Waste Receptacle - including concrete base and locks;

E35.3 1.8m length Tache Style Recycled Plastic Bench with Back.

MATERIALS

E35.4 Supply and Install Site Furniture as itemized below and as noted on the drawings:

- (a) Waste Receptacles - Item # 52501062 Ornamental flat iron slat c/w inserts painted black is a custom item as supplied by:

City of Winnipeg
Public Works, Equipment and Material Services,
102 1155 Pacific Ave.
Winnipeg, Manitoba R3E 1G6
Ph: (204) 986-5504 Fax: (204) 783-1248
Attn.

Contractor to supply lock, key and chain for securing liner.

- (b) 1.8m length Tache Style Recycled Plastic Bench with Back – Item #52501068 complete with Surface Mounted, Bolted Anchoring System is a custom item as supplied by:

City of Winnipeg
Public Works, Equipment and Material Services,
102 1155 Pacific Ave.
Winnipeg, Manitoba R3E 1G6
Ph: (204) 986-5504 Fax: (204) 783-1248
Attn.

E35.5 Concrete Bases specified under Section E23 of this Specification.

CONSTRUCTION METHODS

E35.6 Store units in a protected location, immediately upon arrival on the Site.

E35.7 Remove from Site any units which have been damaged during transportation and replace.

E35.8 Site Furniture shall be installed in locations as indicated on the Construction Drawings.

E35.9 Benches and Waste Receptacles to be installed as per the drawings with cast in place concrete bases.

E35.10 Protect and maintain Site furnishings, including accessories, until acceptance of project Work.

E35.11 Immediately remove from Site, damaged furnishing and accessories. Replace, repair, re-finish, or otherwise make good to approval of Contract Administrator.

MEASUREMENT AND PAYMENT

E35.12 Supply and Installation of Taché Style Recycled Plastic Benches will be measured on a unit basis and paid for at the Contract Unit Price for "1.8m Taché Style Recycled Plastic Benches", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described including the concrete bases and all other items incidental to the Work included in this specification acceptable to the Contract Administrator.

E35.13 Supply and Installation of metal slate waste receptacles will be measured on a unit basis and paid for at the Contract Unit Price for "Waste receptacles", measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described including the concrete bases and all other items incidental to the Work included in this specification acceptable to the Contract Administrator.

E36. UNIT PAVER INSERT FOR BUS STOP

DESCRIPTION

- E36.1 Further to CW 3335 this Specification shall cover the:
- (a) Supply and installation of interlocking paving stones (unit pavers),
 - (b) supply and installation of sand setting bed,
 - (c) supply and installation of grout.
- E36.2 Delivery of unused stockpiled interlocking paving stone.
- E36.3 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary or and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

MATERIALS

- E36.4 Concrete interlocking paving stones (unit pavers) shall be Holland Stone Pavers, supplied by Barkman Concrete, contact Wayne Wiebe, phone 667-3310, as shown on the Drawings and as follows:
- (a) Blue Holland Stone 105x210x60mm (approximate quantity 6 square metres)
 - (b) Natural Holland Square Stone 210x210x60mm (approximate quantity 2 square metres)
- E36.5 Sand:
- (a) Clean brick sand as joint filler.
 - (b) Clean brick sand as minimum 13mm depth setting bed
- E36.6 Grout:
- (a) Grout as specified hereinafter shall be used for grouting paving stone and brick in areas indicated on the drawings. The grout shall have a compressive strength of 25 MPA at 28 days, determined on 50 mm cubes stored and tested in accordance with ASTM C109, and shall consist of normal Portland cement, sand and water.
 - (b) The water-cement ratio shall be kept in the range of 0.45 to 0.55.
 - (c) The grout shall have between 3% and 5% entrained air.
 - (d) Acryl-Stik or approved equal to be used in grout at approximately 4 litres Acryl-Stik to 3 litres water.
 - (e) Admixtures to be used in the grout shall be supplied in accordance with the requirements of the City of Winnipeg Standard CW 3310.
 - (f) The grout shall be of a consistency suitable for the application intended as approved by the Contract Administrator.
 - (g) The Contractor shall provide the Contract Administrator with a mix design statement certifying the constituent materials and mix proportions that will be used in the grout for approval prior to construction.

CONSTRUCTION METHODS

- E36.7 Interlocking paving stones shall be installed in block out in concrete sidewalk or on granular base as per the Drawings.
- E36.8 If cutting of existing concrete sidewalk is required, this shall be incidental to the pay item described in this specification.

- E36.9 Contractor to install stockpiled pavers prior to supply and installation of new pavers.
- E36.10 Install sand setting bed for pavers on granular base as shown on the Drawings.
- E36.11 Contractor to verify the exact dimensions of pavers and panels prior to construction of block outs in concrete sidewalk.
- (a) Install concrete sidewalk as specified on Drawings.
 - (b) Install sand bed to minimum 13mm depth as specified on Drawings. Adjust depth of pavers under areas to be relevelled to ensure surface of pavers is flush with adjacent paving.
 - (c) Do not compact setting bed prior to installation of pavers.
 - (d) Spread only sufficient area which can be covered with pavers same day.
 - (e) Lay pavers on sand bed hand tight.
 - (f) In areas where pavers are to be grouted in place clean existing concrete, install grout bed and then place pavers on grout.
 - (g) Grout between pavers as required ensuring stability.
 - (h) Remove adjacent pavers in bands as required to ensure that bricks do not require cutting on straight bands.
 - (i) Where paving pattern is interrupted by vertical structural elements pavers must be sawcut and fit true and hand tight.
 - (j) Commence installation of pavers against edge to obtain straightest possible course for installation.
 - (k) Pavers shall be cut with a saw only, to obtain true even undamaged edges. Chipped pavers are unacceptable.
 - (l) Crews shall Work on installed pavers, not on sand layer.
 - (m) Spread and fine grade brick sand over paving surface and sweep into joints, in several directions. Sand is incidental to the price for supply and installation of pavers.
 - (n) Compact pavers with vibratory plate compactor having mass of at least 113kg. Compaction is incidental to the price for supply and installation of paving stone.
 - (o) Sweep remaining sand over all paving areas and remove from Site.
 - (p) Replace at no extra cost all whole or cut stones marked as unacceptable.
 - (q) Remove cracked, chipped, broken or otherwise damaged paving materials from Site immediately.
 - (r) Upon completion, clean in accordance with manufacturer's recommendations.

MEASUREMENT AND PAYMENT

- E36.12 Measurement and payment for the supply and installation of interlocking paving stones shall be as per City of Winnipeg Specification CW 3330.

E37. FENCING

DESCRIPTION

- E37.1 Further to CW 3550 specification for Commercial Grade Chain Link Fencing this specification shall cover the supply and installation of 1500mm height chain link fencing, 1800mm height chain link fencing, and supply and installation of aluminium fencing.

MATERIALS

- E37.2 Chain link fencing as per CW 3550.

E37.3 Chain link fencing with bumper curb as per CW3550 with pressure treated wood bumper guard as per the drawings.

E37.4 1.2m and 1.5m height aluminium fencing to be Canadian Eagle II aluminium fencing by Iron Eagle as supplied by:

Wallace and Wallace
Lowson Crescent
Winnipeg MB, R3P 2H8
Ph: 204-452-2700
Attn. Kori Buhler

Or approved equal.

E37.5 Aluminum fence to be painted silver with blue top rails. All paint to be powder paint. Silver colour to be PM211S11 (sparkle silver) by Protech. Blue colour to be 5005 38/40010 by Tiger Drylac.

E37.6 Bolt covers to be custom stainless steel. All costs for supply and installation of bolt covers are incidental to the unit price bid for fencing. Contractor to provide shop drawings for approval prior to manufacture.

CONSTRUCTION METHODS

E37.7 Measure length of fencing to be installed prior to construction. Install posts as per detail and adjust post spacing at ends of fencing runs to provide minimum 1.5m length panels at ends. Post spacing maybe adjusted for up to 5 panels.

E37.8 Construct concrete bases as per the drawings. All bases are incidental to the unit price for each type of fence.

E37.9 Construct fence as per manufacturers' specifications and details.

E37.10 Install bolt covers on posts prior to installation of fence panels.

MEASUREMENT AND PAYMENT

E37.11 1.2m height aluminium fencing shall be measured and paid on a linear metre basis for "1.2m height aluminum fence with custom colour on concrete barrier". The number to be paid shall be the total number of lineal metres constructed in accordance with the Drawings and Specifications and as measure and accepted by the Contract Administrator.

E37.12 1.5m height aluminium fencing shall be measured and paid on a linear metre basis for "1.5m height aluminum fence with custom colour in ground". The number to be paid shall be the total number of lineal metres constructed in accordance with the Drawings and Specifications and as measure and accepted by the Contract Administrator.

E37.13 1.8m ht. chain link fencing c/w wood bumper guard shall be measured and paid on a linear metre basis for "1.8m ht. chain link fencing c/w wood bumper guard ". The number to be paid shall be the total number of lineal metres constructed in accordance with the Drawings and Specifications and as measure and accepted by the Contract Administrator.

E37.14 1.5m ht. chain link fencing shall be measured and paid on a linear metre basis for "1.5m ht. Chain Link Fencing". The amount to be paid shall be the total number of lineal metres constructed in accordance with the Drawings and Specifications and as measure and accepted by the Contract Administrator.

E37.15 1.83m height chain link fencing shall be measured and paid as per CW3550.

E38. RUMBLE STRIP IN ASPHALT PAVING

DESCRIPTION

E38.1 This specification shall supplement the specification for Asphaltic Concrete Pavement Works CW3410.

MATERIALS

E38.2 All materials as per CW3410.

CONSTRUCTION METHODS

E38.3 During installation of asphalt pathways the Contractor shall form into the pathway a rumble strip as per the drawings.

E38.4 The rumble strip shall be formed prior to the asphalt setting by mechanical forming.

E38.5 Contractor to ensure that the forming of the rumble strip does not adversely affect the strength or quality of the asphalt paving.

Measurement and Payment

E38.6 Forming of rumble strips is incidental to the unit prices bid for asphalt pathway.

E39. DEMOLITION AND REMOVALS

DESCRIPTION

E39.1 The Work required under this section shall include, but is not limited to, the following:

(a) Demolition and removal of existing building foundations

E39.2 The Work required under this section shall include, but is not limited to, the following: Removal of existing concrete, removal of existing steel, removal of existing construction debris, demolition, protection of services to be maintained, demolition and disposal of existing concrete, demolition and disposal of existing steel, and clean up of Work Site in anticipation of new Work for the limits of the Contract as shown on the drawings.

E39.3 The Work to be done by the Contractor under this Section 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 described hereinafter.

E39.4 References

E39.4.1 CSA S350-M1980, Code of Practice for Safety in Demolition of Structures.

E39.4.2 Manitoba Workplace Safety and Health Act, and all applicable National, Provincial, and Municipal regulations.

E39.5 Protection

E39.5.1 Prevent movement, settlement or damage of adjacent structures. Make good damage caused by demolition.

E39.6 Execution

E39.6.1 Inspection

(a) Inspect Site with Contract Administrator and verify extent and location of items designated for removal, disposal, salvage and items to remain.

- (b) Locate and protect utilities.
- (c) Notify and obtain approval of Contract Administrator before starting demolition.

E39.6.2 Preparation

- (a) Do not disrupt active or energized utilities.

E39.6.3 Safety Code and Requirements

- (a) Unless otherwise specified, carry out demolition Work in accordance with the City of Winnipeg Safety Directives and Guidelines.
- (b) Blasting operations shall not be permitted during demolition unless reviewed and approved by the Contract Administrator.

E39.6.4 Demolition

- (a) Demolish structures to permit construction of new Work as indicated.
- (b) Demolish structures under proposed roadways, transitways, or active transportation pathways to a depth of 1m below the bottom of the subgrade and at a minimum of 1m horizontally from the edge of excavation.
- (c) Demolish structures not under proposed roadways, transitways, or active transportation pathways to a depth of 1m below the final ground elevation.
- (d) At end of each day's Work, leave Work in safe condition so that no part is in danger of toppling or falling.
- (e) Do not sell or burn materials on Site.

E39.6.5 Disposal of Demolished Material

- (a) The Contractor shall be responsible for removal of debris and waste from the Work area to the location to an appropriate solid waste disposal area approved by the Contract Administrator.
- (b) Metal debris, which may include structural steel, miscellaneous inserts, and reinforcing steel, shall be removed from Site and disposed of by the Contractor.

MEASUREMENT AND PAYMENT

E39.7 Concrete Demolition

- (a) Demolition of concrete will be measured on a unit basis and paid for at the Contract Unit Price per tonne for "Demolition and Removals".
- (b) No payment shall be made for demolition beyond the limits specified, or those otherwise approved by the Contract Administrator. The separation, as necessary of embedded and structural steel shall be considered incidental to the Work. Removal of construction debris shall be considered incidental to the Work.

E40. REMOVE, SALVAGE AND REINSTALL EXISTING PARKING CURBS AT VIA RAIL

DESCRIPTION

- E40.1 This specification shall cover the removal, salvage and reinstallation of the existing parking curbs at Via Rail.

CONSTRUCTION METHODS

- E40.2 Remove, salvage and store parking curbs from the existing parking lot so as they are not damaged.
- E40.3 Upon placement of the parking curbs, if the quantity exceeds the requirement, reinstall the best ones, keeping them in place with pins minimum 15 mm dia. X 350 mm long rebar spikes.

MEASUREMENT AND PAYMENT

- E40.4 Remove, salvage, and reinstall existing parking curbs will not be measured or paid for as this work will be incidental to the construction of the VIA Rail Parking lot.

E41. PAINTED PAVEMENT MARKINGS

DESCRIPTION

- E41.1 The work of this section comprises the furnishing of all labour, equipment and materials required to complete the painted pavement markings as shown on the drawings and as hereinafter specified.

MATERIALS

- E41.2 Paint shall conform to City of Winnipeg specification for reflectorized traffic paint or suitable equivalent for application to asphalt and/or concrete surface.
- E41.2.1 CGSB 1-GP-74M + Amdt-May-81, alkyd traffic paint
- E41.2.2 High Gloss Traffic Paint (IBIS Products Limited)
- E41.3 Paint colours shall be:
- E41.3.1 Yellow - all centre lines, parking stall lines, painted medians, and handicap symbols illustrated on plan
- E41.3.2 White - stop bars, passing lane lines, bicycle symbols, and arrows.
- (a) CGSB 1-GP-12C + Amdt-Dec-84, yellow 505-308, white 513-301 (MTO Spec. 1710);(White 40-2478, Yellow 40-3057-IBIS Products Limited)
- (b) Federal Traffic Paint, Yellow 40-3597 Qual No 80087, White 40-3596 Qual No 80086 (IBIS Products Limited)
- (c) High Gloss Traffic Paint, Yellow 40-1821 (IBIS Products Limited)
- E41.4 Thinner to CGSB 1-GP-5M
- E41.5 Glass Beads: Overlay Type: To CGSB 1-GP-74 ÷ Amdt-May-81

CONSTRUCTION METHODS

- E41.6 Line painting to be done upon completion of asphalt paving work and curing time. All lines are to be to as per the drawings or as required by TAC standards.
- E41.7 No markings shall be performed when the temperature is below 10⁰ Celsius nor during rainfall or fog, or until the surface is perfectly dry. No markings shall be done if, in the opinion of the Site supervisor, the conditions are not conducive to provide a top quality result.
- E41.8 Immediately before application of the paint, the existing surface shall be dry and entirely free from dirt, grease, oil acids, laitance, or other foreign matter which would reduce the bond between the coat of paint and the asphalt/concrete. The surface shall be thoroughly cleaned by sweeping and blowing as required to remove all dirt, laitance and loose materials.
- E41.9 Suitable chalkline layouts of proposed lines and arcs shall be spotted in advance of the paint application. Control points shall be spaced at such intervals as will ensure accurate location of all markings.
- E41.10 When discrepancies between the drawings and the field layout occur, these discrepancies are to be reported to the Contract Administrator for further action before proceeding with the application of paint.

- E41.11 The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimension, and application of the paint.
- E41.12 Paint shall be applied at a rate of 200 lineal feet per gallon (60m per 4.5L) and maintain a uniform lines unless otherwise indicated on specifications drawings.
- E41.13 The paint shall be mixed in accordance with the manufacturer's instructions before application. The paint shall be thoroughly mixed and applied to the surface of the concrete with the marking machine. The surface shall receive two (2) coats, the first coat shall be thoroughly dry before the second coat is applied.
- E41.14 Glass beads are to be added to paint as per manufacturer's specifications.
- E41.15 The paint applicator to be an approved pressure type mobile distributor capable of applying paint in single or double and dashed lines, and that will ensure uniform application and having a positive shut-off.
- E41.16 In the application of straight strips, any deviation in the edges exceeding 1/2 inch in 50 feet shall be obliterated and the marking corrected. The width of the markings shall be as designated within a tolerance of 5 percent. All paintings shall be performed to the satisfaction of the Contract Administrator by competent and experienced equipment operators, labourers, and artisans in a neat and workmanlike manner.
- E41.17 Thoroughly clean distribution tank before refilling with paint of different colour.
- E41.18 After application of the paint, all markings shall be protected while the paint is drying. The fresh paint shall be protected from injury or damage of any kind. The Contractor shall be directly responsible and shall erect or place suitable warning signs, flags, or barricades, protective screens, or coverings as required. All surfaces shall be protected from disfiguration by spatter, splashes, spillage drippings, of paint or other materials.
- E41.19 Parking stall lines will be painted as per drawing and/or as directed by the Contract Administrator. Each stall line will be 75 mm wide and 6.0 m long.

MEASUREMENT AND PAYMENT

- E41.20 Line painting will be measured and paid for at the Contract lump sum price for "Line Painting" 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.

E42. 250MM BARRIER CURB

DESCRIPTION

- E42.1.1 The Work shall include all concreting operations related to construction of the 250 mm concrete barrier curb at the Fort Rouge Yard station and the Fort Rouge Yards on street transit bus stop in accordance with this Specification and as shown on the Drawings.
- E42.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

MATERIALS

- E42.2 As per E21: Structural Concrete.

CONSTRUCTION METHODS

- E42.3 As per E21: Structural Concrete.

QUALITY CONTROL

E42.4 As per E21: Structural Concrete.

MEASUREMENT AND PAYMENT

E42.5 The supply and installation of 250 mm Barrier Curb will be measured and paid for on a lineal basis at the Contract Unit Price per metre for "Construction of Barrier (250mm ht, Separate)". The amount to be paid for will be the total number of lineal metres supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E43. CONCRETE DRAINAGE CHANNEL

DESCRIPTION

E43.1 The Work shall include all concreting operations related to construction of the concrete drainage channel on the east side of the south approach to the tunnel in accordance with this Specification and as shown on the Drawings.

E43.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

MATERIALS

E43.3 As per City of Winnipeg Specification CW3310.

CONSTRUCTION METHODS

E43.4 As per City of Winnipeg Specification CW3310.

MEASUREMENT AND PAYMENT

E43.5 The supply and installation of the concrete drainage channel will be measured and paid for on a lineal basis at the Contract Unit Price per metre for "Concrete Drainage Channel". The amount to be paid for will be the total number of lineal metres supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.

E44. CONCRETE LANDSCAPE WORKS

DESCRIPTION

E44.1 The Work shall include all concreting operations related to construction of the CIP concrete landscape curb and the CIP retaining wall in accordance with this Specification and as shown on the Drawings.

E44.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

MATERIALS

E44.3 As per E21: Structural Concrete.

CONSTRUCTION METHODS

E44.4 As per E21: Structural Concrete.

MEASUREMENT AND PAYMENT

E44.5 The supply and installation of the cast-in-place concrete landscape curb will be measured and paid for on a lineal basis at the Contract Unit Price per metre for "CIP Concrete Landscape Curb". The amount to be paid for will be the total number of lineal metres supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator. The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials including steel reinforcement, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

E44.6 The supply and installation of the cast-in-place concrete retaining wall will be measured and paid for on a lineal basis at the Contract Unit Price per metre for "CIP Concrete Retaining Wall". The amount to be paid for will be the total number of lineal metres supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator. The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials including steel reinforcement, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

E45. FINAL TRIMMING AND SUBGRADE COMPACTION AT TUNNEL APPROACHES

DESCRIPTION

E45.1 The Work shall include final trimming and compaction of the subgrade at the tunnel approaches on the north and south slopes to the tunnel in accordance with this Specification and as shown on the Drawings.

E45.2 The Contract #4 Contractor has been instructed to leave the approaches to the tunnel excavated to subgrade upon leaving the Site for the Contract #6 Contractor to complete the construction of the roadworks. These grades may not be left from one Contractor to the next at exactly the elevations as shown on the drawings, therefore 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.

MATERIALS

E45.3 As per City of Winnipeg Specification CW3110.

CONSTRUCTION METHODS

E45.4 As per City of Winnipeg Specification CW3110.

MEASUREMENT AND PAYMENT

E45.5 Excavation – As per City of Winnipeg Specification CW 3110.

E45.6 Subgrade Compaction - As per City of Winnipeg Specification CW 3110.

E46. DISPOSAL OF MATERIAL

DESCRIPTION

- E46.1 The specification shall cover the removal and disposal of excess material within the Site or as directed by the Contract Administrator in accordance with this Specification and as shown on the Drawings.
- E46.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.
- E46.3 All material within the top 1 m of excavation will be required to stay on-site as per D15.
- E46.4 Location of Material
- E46.4.1 Material will include but may not be limited to:
- (a) The stockpile currently at the site just south of the VIA Rail entrance at Brandon Street, and

MATERIALS

- E46.5 As per City of Winnipeg Specification CW3170.

CONSTRUCTION METHODS

- E46.6 As per City of Winnipeg Specification CW3170.

DISPOSAL OF MATERIAL

- E46.7 As per City of Winnipeg Specification CW3170: 9.4.

MEASUREMENT AND PAYMENT

- E46.8 Loading and hauling of excess material to an approved disposal site shall be measured and paid for as Common Excavation – Unsuitable Site Material as per City of Winnipeg Specification CW 3170.

E47. PROTECTIVE GRAFFITI COATING

DESCRIPTION

- E47.1 The work comprises the furnishings of all labour, equipment, services and materials require to complete the application of graffiti coating on all vertical concrete surfaces including but not limited to Decorative Planters and exposed portion of concrete foundation.

RELATED WORKS

- E47.2 Contractor shall visit the Site and verify all data and dimensions and report any errors, omissions, or discrepancies to the Contract Administrator prior to any installation.

SUBMITTALS

- E47.3 Include sample of material.
- E47.4 Provide product data on specified product, describing physical characteristics and maintenance instructions.

MATERIAL

E47.5 Graffiti Coating: #M74-001/M75 Aliphatic Acrylic Urethane Gloss Clear Finish by Benjamin Moore and Co. Contact Portage Avenue Paints, Phone 788-0303.

E47.6 Accessories and Application Equipment: As per manufacturer's specifications.

EXECUTION

E47.7 Surface Preparation and application of graffiti coating to be executed as per manufacturer's specification.

E47.8 Surface Preparation: Remove all loose particles, laitance, oil, grease, form release agents and any other contaminants. New concrete and masonry must be allowed to cure for a minimum of 28 days. Before painting, roughen the surface by abrasive blasting, acid etching or scarifying.

E47.9 Due to the rapid dry of this coating only small areas may be coated by brush, applicator pad or roller. Care must be taken to achieve the specified wet and dry film thickness. Uniform even coats must be obtained. This paint is best applied by spray, however, this type of application may not be permitted on-site and must be reviewed and approved by the City of Winnipeg Health Department prior to start of application.

E47.10 Contractor to install Graffiti Coating on cleaned concrete surface.

E47.11 Graffiti Coatings to be installed as per manufacturer's specifications and as directed by Contract Administrator on-site.

E47.12 Maintain graffiti coating on all vertical concrete surfaces for a period of five (5) years

MEASUREMENT AND PAYMENT

E47.13 Graffiti Coating shall be incidental to unit prices bid for vertical concrete elements under this Contract.

E48. CONCRETE FILLED STEEL BOLLARDS

DESCRIPTION

E48.1 This specification covers the supply and installation of concrete filled steel bollards

E48.2 General

E48.2.1 Store units in a protected location, immediately upon arrival on the Site.

E48.2.2 Remove from Site any units which have been damaged during transportation and replace.

MATERIALS

E48.3 A-coated steel bollard to be 150mm diameter steel pipe with dowels welded as per drawing.

E48.4 Concrete as specified under E21 of this Specification.

E48.5 Paint is to be commercial grade suitable for exterior application on metal. Paint colour to be caution yellow. Contractor to provide specification for paint for approval prior to installation.

CONSTRUCTION METHODS

E48.6 Contractor to form base and set bollards plum in locations as indicated on drawings.

E48.7 Concrete base to be poured and finished with smooth broom finish on top of base.

- E48.8 Concrete to fill bollard to be continuous pour with base.
- E48.9 All spill over to be cleaned from bollard immediately. Concrete is not to be left to harden on outside of exposed bollard.
- E48.10 Dome concrete on top of bollard and provide smooth clean finish.
- E48.11 After concrete has cured mask base and paint with caution yellow metal paint.

MEASUREMENT AND PAYMENT

- E48.12 Supply and installation of concrete filled steel bollards will be measured and paid for at the per unit price for "concrete filled steel bollards", 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. The number of each item to be paid for will be the total number supplied and placed in accordance with this Specification and accepted by the Contract Administrator, as measured by the Contract Administrator.

E49. TEMPORARY FENCING

DESCRIPTION

- E49.1 General
 - (a) This specification shall be supplemental to CW 3550.
 - (b) This specification shall cover the supply and installation of Temporary Fencing along the CN Rail line on the west side of the project Site. This fence shall be placed at the start of the project.

MATERIALS

- E49.2 Fencing
 - (a) The temporary fence described herein shall consist of plastic snow fence or an equal approved by the Contract Administrator.
 - (b) The Contractor shall discuss their temporary fencing intentions with the Contract Administrator prior to installation.

CONSTRUCTION METHODS

- E49.3 Temporary Fencing
 - E49.3.1 CN Rail Fence
 - (a) The temporary fencing to be placed at the location described herein shall be erected and maintained throughout the duration of the project, until such time that the grading on the west side of the Transitway has been completed and the permanent fence can be erected.
 - (b) The temporary fencing shall be to a minimum height of 1200 mm.

MEASUREMENT AND PAYMENT

- E49.4 Installation of Temporary Fencing will be measured on a length basis and paid for at the Contract Unit Price per lineal metre for the "Temporary Fencing – 1200 mm height". The length to be paid for shall be the total number of lineal metres supplied and installed in accordance with this specification and accepted by the Contract Administrator.

E50. SAFE WORK ENVIRONMENT DURING CONSTRUCTION WITHIN THE TUNNEL

DESCRIPTION

- E50.1 This specification shall cover the provision for maintaining a safe work environment during construction within or in close proximity to the Tunnel under this Contract.
- E50.2 This specification shall include the supply of a document outlining how the Contractor will maintain a safe work environment, as described within this specification, as well as the actions needed to carry out that plan. This specification will be supplemental to the Safe Work Plan outlined in D9.
- E50.3 This specification is considered to be supplemental to the air quality and ventilation requirements set forth by Manitoba Workplace Safety and Health, specifically but not limited to, those put forth for excavations and confined entries.
- E50.4 Methods
- E50.4.1 The Contractor is responsible for developing a safe work environment plan to ensure that anyone in or near the Tunnel site are not at risk. The plan must include but is not limited to the following measures;
- (i) Pre Work air quality testing:
 - (ii) Including, but not limited to, tunnel atmosphere testing and common atmospheric hazards include but not limited to, gasoline vapours, methane, Carbon Dioxide, Carbon Monoxide as well as a lack of oxygen.
 - (iii) Preventing an unsafe work environment
 - ◆ Including, but not limited to air quality, lighting, and fire protection.
 - (iv) Quality Assurance:
 - ◆ Including, but not limited to, regular testing of air quality and work environment conditions performed by qualified personnel who have the knowledge and expertise in this field. All tests conducted must be recorded, kept on-site, and made available to the following, but not limited, list of individuals: workers for the Contractor, Subcontractor or material suppliers, the Contract Administrator, the City, and Work Place Health and Safety, upon request.
 - (v) Controlling an unsafe work environment should one exist.
- E50.4.2 The Contractor must provide a plan for maintaining air quality to Manitoba Workplace Safety and Health standards to the Contract Administrator for their information, within the Safety Plan as outlined in D9.

MEASUREMENT AND PAYMENT

- E50.4.3 No measurement or payment will be made for provision of Temporary Tunnel Ventilation

E51. REMOVALS AND TREE PRUNING

DESCRIPTION

- E51.1 This Specification shall cover:
- (a) abandonment of wood irrigation box;
 - (b) excavation and removal of existing shrub bed;
 - (c) disconnect, removal and disposal of light pole;
 - (d) disconnect, relocate and reconnect existing block heater outlets;
 - (e) pruning of existing trees; and

(f) removal of the soccer/football goal posts.

E51.2 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.

CONSTRUCTION METHODS

E51.3 The Contractor shall restrict his activities strictly to within the limits of the Works, unless receiving prior written approval from the Contract Administrator.

E51.4 Abandonment of wood irrigation box:

- (a) Contractor shall confirm that the existing irrigation lines and water source are disconnected from the irrigation box on Brandon Avenue prior to any removals.
- (b) Irrigations lines are to be cut and capped by qualified irrigation Contractor.
- (c) All valves, and connectors are to be removed and disposed of.
- (d) Wood box to be removed and hole backfilled with clean material suitable for surface works.
- (e) Location of abandoned irrigation lines to be marked on as built drawings.

E51.5 Excavation and removal of existing shrub bed:

- (a) Contractor to mark out limit of shrub bed to be removed for approval by Contract Administrator prior to excavation.
- (b) Contractor to remove and dispose of all plant material, mulch and fabric in area to be removed. Where only a portion of the shrub bed is to be removed, the Contractor is to cut all fabric and roots along line of excavation prior to removal.
- (c) Following removal of shrubs, including root system, Contractor to excavate the remaining planting soil and backfill with compacted suitable sub base and base material for construction of finished surface.
- (d) All debris and soil to be cleaned from Site and remaining shrub bed.

E51.6 Disconnect, removal and disposal of light pole:

- (a) Contractor to remove existing light pole and concrete base on Winnipeg Transit property as shown on the drawings.
- (b) Contractor to ensure light is disconnected at source prior to removal.
- (c) Remove and dispose of light pole.
- (d) Light fixture to be delivered to Winnipeg Transit stores on-site. Contact Brian Newton 986-5121 for storage location.
- (e) Concrete base to be removed to minimum 1.2m below finish grade. Fill hole with compacted base material suitable for finished surface.

E51.7 Disconnect, relocate and reconnect existing block heater outlets:

- (a) Contractor to disconnect existing block heater outlets on Winnipeg Transit property in location shown on the drawings.
- (b) Relocate wiring and conduit to new fence as shown on the drawings.
- (c) Reinstall existing block heater outlets on new fence in location to service parking spaces. Replace defective or damaged outlets.

E51.8 Pruning of existing trees:

- (a) Existing trees to be pruned to City of Winnipeg Forestry standards to ensure bottom branches are above head height for cyclists (approx 3.0m).
- (b) Contractor to mark out branches to be removed prior to pruning for approval by City Forester.

- (c) Trees to be pruned include street trees, trees on Winnipeg Transit property and existing trees to remain near the proposed Fort Rouge Station.

E51.9 Removal of Soccer/Football Goal Posts:

- (a) Contractor to remove existing soccer/football goal posts as shown on the drawings, to the Contract Administrator's approval, and haul them to a location for salvaging, designated by the City of Winnipeg.
- (b) Contractor to ensure that the holes left behind by the goal posts are filled with material so as not to be a hazard.

E51.10 The Contractor shall ensure that upon completion of the removal and pruning operations, the Site shall be left free of any hazardous depressions and in a neat condition.

MEASUREMENT AND PAYMENT

- E51.11 Abandonment of wood irrigation box will be measured and paid for at the lump sum price for "Abandonment of Wood Irrigation Box", 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. The number of each item to be paid for will be the total number supplied and placed in accordance with this Specification and accepted by the Contract Administrator, as measured by the Contract Administrator.
- E51.12 Excavation and removal of existing shrub bed will be measured and paid for at the lump sum price for "Excavation and Removal of Existing Shrub Bed", 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. The number of each item to be paid for will be the total number supplied and placed in accordance with this Specification and accepted by the Contract Administrator, as measured by the Contract Administrator.
- E51.13 Disconnect, removal and disposal of light pole will be measured and paid for at the lump sum price for "Disconnect, Removal and Disposal of Light Pole", 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. The number of each item to be paid for will be the total number supplied and placed in accordance with this Specification and accepted by the Contract Administrator, as measured by the Contract Administrator.
- E51.14 Disconnect, relocate and reconnect existing block heater outlets will be measured and paid for at the lump sum price for "Disconnect, Relocate and Reconnect Existing Block Heater Outlets", 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. The number of each item to be paid for will be the total number supplied and placed in accordance with this Specification and accepted by the Contract Administrator, as measured by the Contract Administrator.
- E51.15 Pruning of existing trees will be measured and paid for at the lump sum price for "Pruning of Existing Trees", 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. The number of each item to be paid for will be the total number supplied and placed in accordance with this Specification and accepted by the Contract Administrator, as measured by the Contract Administrator.
- E51.16 Removal of soccer/football goal posts will be measured and paid for at the Contract Unit Price for "Removal of Soccer/Football Goal Posts ", 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. The number of each item to be paid for will be the total number supplied and placed in accordance with this Specification and accepted by the Contract Administrator, as measured by the Contract Administrator.