



**THE CITY OF WINNIPEG**

# **BID OPPORTUNITY**

**BID OPPORTUNITY NO. 513-2007**

**THE CITY OF WINNIPEG TRANSIT DEPARTMENT – ON STREET TRANSIT  
PRIORITY IMPROVEMENTS –PHASE I**

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## **PART B - BIDDING PROCEDURES**

### **B1. CONTRACT TITLE**

B1.1 The City of Winnipeg Transit Department – On Street Transit Priority Improvements –Phase I

### **B2. SUBMISSION DEADLINE**

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, August 15, 2007.

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

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

### **B3. ENQUIRIES**

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

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

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

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

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

### **B4. ADDENDA**

B4.1 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.

B4.2 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.

B4.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.

B4.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Branch internet website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.

B4.3 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.

### **B5. SUBSTITUTES**

B5.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.

- B5.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B5.3 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.
- B5.4 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.
- B5.5 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.
- B5.6 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.
- B5.6.1 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.
- B5.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B5.8 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 B14.
- B5.9 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. BID COMPONENTS**

- B6.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
  - (b) Form B: Prices;
  - (c) Form G1: Bid Bond and Agreement to Bond, or  
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or  
a certified cheque or draft.

- B6.2 Further to B6.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B5.
- B6.3 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.
- B6.4 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.
- B6.4.1 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.
- B6.5 Bidders are advised not to include any information/literature except as requested in accordance with B6.1.
- B6.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, may result in the Bid being determined to be non-responsive.
- B6.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B6.8 Bids shall be submitted to:  
The City of Winnipeg  
Corporate Finance Department  
Materials Management Branch  
185 King Street, Main Floor  
Winnipeg MB R3B 1J1

**B7. BID**

- B7.1 The Bidder shall complete Form A: Bid, making all required entries.
- B7.2 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.
- B7.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B7.2.
- B7.3 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.
- B7.4 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.

B7.4.1 The name and official capacity of all individuals signing Form A: Bid shall be printed below such signatures.

B7.4.2 All signatures should be witnessed, except where a corporate seal has been affixed.

B7.5 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.

## **B8. PRICES**

B8.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B8.2 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.

B8.3 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.

B8.4 Form B: Prices is organized into Parts: Part A through Part J of the Work. Bidders shall provide a total price for each Part and, on the summary sheet, a Total Bid Price consisting of the sum of prices for Part A through J.

## **B9. QUALIFICATION**

B9.1 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.

B9.2 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 Branch internet site at <http://www.winnipeg.ca/matmgt>).

B9.3 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).

- B9.4 Further to B9.3(c), the Bidder shall, within three (3) 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 Branch internet site at <http://www.winnipeg.ca/matmgt.>)
- B9.5 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.
- B9.6 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.

## **B10. BID SECURITY**

- B10.1 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.
- B10.1.1 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.
- B10.1.2 All signatures on bid securities shall be original, and shall be witnessed or sealed as required.
- B10.2 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.
- B10.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B10.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.
- B10.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.
- B10.3 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.



## **B11. OPENING OF BIDS AND RELEASE OF INFORMATION**

B11.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Branch, or in such other office as may be designated by the Manager of Materials.

B11.1.1 Bidders or their representatives may attend.

B11.1.2 Bids determined by the Manager of Materials, or his designate, to not include the bid security specified in B10 will not be read out.

B11.2 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 Branch internet site at <http://www.winnipeg.ca/matmgt>.

B11.3 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 Branch internet site at <http://www.winnipeg.ca/matmgt>.

B11.4 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.

## **B12. IRREVOCABLE BID**

B12.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.

B12.2 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.

## **B13. WITHDRAWAL OF BIDS**

B13.1 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.

B13.1.1 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.

B13.1.2 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.

B13.1.3 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 B13.1.3(b), declare the Bid withdrawn.

B13.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B12.2 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.

#### **B14. EVALUATION OF BIDS**

B14.1 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 (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B9 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B5.

B14.2 Further to B14.1(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.

B14.2.1 Any bid with an apparent imbalance between the unit prices in Part A through J may be determined to be non-responsive and rejected by the Award Authority in its sole discretion, acting reasonably.

B14.3 Further to B14.1(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.

B14.4 Further to B14.1(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.

B14.4.1 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. AWARD OF CONTRACT**

B15.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B15.2 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.

B15.2.1 Without limiting the generality of B15.2, 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.

B15.3 Subject to B15.2, 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.

B15.3.1 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.

- B15.4 As noted in D2, and identified in Form B: Prices and the Contract Drawings, the Work of Part E between Station 1+000 and 1+200 will be contingent upon sufficient clearance over the existing MTS concrete encased duct line. If sufficient clearance is not available, the City shall have the right to eliminate all or part of Part J between the Stations identified in accordance with D2.

## **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 Branch internet site at <http://www.winnipeg.ca/matmgt>.
- 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) On Street Transit Priority Improvements – Phase 1
  - (i) Part A: Pembina Corridor – Pembina Hwy @ University Cres
  - (ii) Part B: Pembina Corridor – Pembina Hwy @ Bishop Grandin Blvd E/B Off Ramp
  - (iii) Part C: Pembina Corridor – Pembina Hwy @ Jubilee Ave
  - (iv) Part D: Pembina Corridor – Osborne St @ Corydon Ave
  - (v) Part E: St. Mary's Corridor – St. Mary's Rd @ Bishop Grandin Blvd
  - (vi) Part F: St. Mary's Corridor – St. Mary's Rd @ Dunkirk/Dakota
  - (vii) Part G: St. Anne's Corridor – St. Anne's Rd @ Bishop Grandin Blvd
  - (viii) Part H: St. Anne's Corridor – St. Anne's Rd @ Fermor Ave
  - (ix) Part I: St. Anne's Corridor – St. Anne's Rd @ Kingswood Ave
  - (x) Part J: All Corridors – Traffic Signal Installation Restorations

D2.2 Bidders are advised that the construction of Part E between Station 1+000 and 1+200 on the drawings is contingent on sufficient clearance of the new roadway lane over the existing MTS concrete encased duct line. Clearances are being confirmed by hydroexcavation method organized by the Contract Administrator in late July 2007.

D2.2.1 Further to D2.2, if adequate clearance as deemed by MTS and the Contract Administrator is not achievable, the City shall have the right to eliminate all or part of Part E between Station 1+000 and 1+200, and the Contract Price will be reduced accordingly.

D2.2.2 If all or part of Part E between Station 1+000 and 1+200 is eliminated pursuant to D2.2.1, the time periods stipulated in D19 for Substantial Performance of the Work and in D20 for Total Performance of the Work will be reduced proportionally by the Contract Administrator acting reasonably.

D2.3 The major components of the Work for all Parts generally include the following:

- (a) All Parts - General
  - (i) Excavation of existing boulevard, traffic island, private approaches, etc.
  - (ii) Adjustment, relocation, replacement of drainage inlets, fire hydrants, and other pavement appurtenances
  - (iii) Full depth concrete lane construction (sometimes tinted concrete at grade)
  - (iv) Construction of concrete curbs, sidewalks, bullnoses, and other miscellaneous concrete slabs
  - (v) Installation or reinstallation of barrier rail and posts
  - (vi) Boulevard grading and sodding
  - (vii) Placement of asphalt mainline, tie-ins, and patching as necessary

D2.4 The specific components of the Work for each Part include the following:

- (a) Part A: Pembina Corridor – Pembina Hwy @ University Cres
  - (i) General – Widening of W/B University Crescent to three travel lanes.

- (ii) New asphalt overlaid concrete travel lane
  - (iii) Adjustment of existing barrier rail and posts
- (b) Part B: Pembina Corridor – Pembina Hwy @ Bishop Grandin Blvd E/B Off Ramp
  - (i) General – New Transit lane and bus stop from Bishop Grandin Off Ramp to existing “Jug Handle” bus stop
  - (ii) New slip formed concrete Transit lane. Tinted concrete to be utilized for portion
  - (iii) Paving stone detail and flag (sign) foundation at bus stop
- (c) Part C: Pembina Corridor – Pembina Hwy @ Jubilee Ave
  - (i) General – Cutting back traffic island to create Transit queue jump lane
  - (ii) Tinted at grade concrete lane
- (d) Part D: Pembina Corridor – Osborne St @ Corydon Ave
  - (i) General – Cutting back traffic island to create Transit lane at Corydon. Reconstruction of existing Transit lane between Corydon and McMillan
  - (ii) Tinted at grade concrete lane
  - (iii) Paving stone renewal along Transit lane
- (e) Part E: St. Mary’s Corridor – St. Mary’s Rd @ Bishop Grandin Blvd
  - (i) General – Lengthening of existing right turn deceleration lane. Cutting back traffic island to extend Transit lane.
  - (ii) New asphalt overlaid concrete travel lane in right turn deceleration lane and tinted at grade concrete lane at Bishop Grandin
  - (iii) Planing existing asphalt overlay north of Bishop Grandin
  - (iv) Structural retaining wall and sidewalk
- (f) Part F: St. Mary’s Corridor – St. Mary’s Rd @ Dunkirk/Dakota
  - (i) General – Cutting back traffic island to create Transit queue jump lane
  - (ii) Tinted at grade concrete lane
- (g) Part G: St. Anne’s Corridor – St. Anne’s Rd @ Bishop Grandin Blvd
  - (i) General – Construction of second W/B left turn storage lane
  - (ii) New asphalt overlaid concrete storage lane
  - (iii) Supply and installation of new barrier rail and posts
- (h) Part H: St. Anne’s Corridor – St. Anne’s Rd @ Fermor Ave
  - (i) General – Cutting back traffic island to create Transit lane
  - (ii) Tinted at grade concrete lane
- (i) Part I: St. Anne’s Corridor – St. Anne’s Rd @ Kingswood Ave
  - (i) General – Cutting back traffic island to create Transit queue jump lane
  - (ii) Tinted at grade concrete lane
- (j) Part J: All Corridors – Traffic Signal Installation Restorations
  - (i) General – Concrete restorations after Traffic Signals Branch work in various locations on the corridors other than those shown on Drawings. Work likely limited to intersections of Pembina/Waller, St. Mary’s/St. Anne’s.
  - (ii) Work limited to cut restorations such as sidewalk and curbs.

**D3. CONTRACT ADMINISTRATOR**

D3.1 The Contract Administrator is Dillon Consulting Limited, represented by:

David Wiebe, P. Eng.  
Project Manager  
Suite 200 – 895 Waverley Street  
Winnipeg, Manitoba R3T 5P4  
Telephone No. (204) 453-2301  
Facsimile No. (204) 452-4412

D3.2 At the pre-construction meeting, David Wiebe, P. Eng. will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

**D4. CONTRACTOR'S SUPERVISOR**

D4.1 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.

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

**D5. NOTICES**

D5.1 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.

D5.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D5.3, D5.4 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.

D5.3 All notices of appeal to the Chief Administrative Officer shall be sent to the following address or facsimile number:

The City of Winnipeg  
Chief Administrative Officer Secretariat  
Attn: Chief Administrative Officer  
Administration Building, 3rd Floor  
510 Main Street  
Winnipeg MB R3B 1B9  
Facsimile No.: (204) 949-1174

D5.4 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  
Corporate Services Department  
Legal Services Division  
Attn: City Solicitor  
185 King Street, 3rd Floor  
Winnipeg MB R3B 1J1  
Facsimile No.: (204) 947-9155

## **D6. FURNISHING OF DOCUMENTS**

- D6.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him at cost.

## **SUBMISSIONS**

### **D7. AUTHORITY TO CARRY ON BUSINESS**

- D7.1 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.

### **D8. SAFE WORK PLAN**

- D8.1 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.
- D8.2 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 Branch internet site at <http://www.winnipeg.ca/matmgt>.

### **D9. INSURANCE**

- D9.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability, broad form property damage cover and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
  - (b) automobile liability insurance for owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00) at all times during the performance of the Work and until the date of Total Performance;
  - (c) an all risks Installation Floater carrying adequate limits to cover all machinery, equipment, supplies and/or materials intended to enter into and form part of any installation.
- D9.2 Deductibles shall be borne by the Contractor.
- D9.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in the C4.1 for the return of the executed Contract.
- D9.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least fifteen (15) Calendar Days prior written notice to the Contract Administrator.



## **D10. PERFORMANCE SECURITY**

- D10.1 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.
- D10.1.1 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.
- D10.2 If the bid security provided in his Bid was not a certified cheque or draft pursuant to B10.1(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.

## **D11. SUBCONTRACTOR LIST**

- D11.1 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.

## **D12. EQUIPMENT LIST**

- D12.1 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 seven (7) 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.
- D12.2 For equipment to be used in proximity of the Fort Garry-St. Vital Feedermain in Part B of the work, the equipment list shall include the requirements of E8.

## **D13. DETAILED WORK SCHEDULE**

- D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule (Form L: Detailed Work Schedule) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.
- D13.2 If, prior to submitting the Detailed Work Schedule, the Contractor does not receive notification pursuant to D2.2 that all or part of Part E between Station 1+000 and 1+200 of the Work may be commenced, he shall complete Form L: Detailed Work Schedule for all other Parts only assuming that, if all or part of Part E between Station 1+000 and 1+200 is eliminated, the time periods stipulated in D19 for Substantial Performance of the Work and in D20 for Total Performance of the Work will be reduced by five (5) Working Days.

D13.3 If, after submitting the Detailed Work Schedule, the Contractor receives notification that all or part of Part E between Station 1+000 and 1+200 may be commenced, the Contractor shall submit a revised Detailed Work Schedule no later than two (2) Business Days from receipt of the notification.

## **SCHEDULE OF WORK**

### **D14. COMMENCEMENT**

D14.1 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.

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

- (a) the Contract Administrator has confirmed receipt and approval of:
  - (i) evidence of authority to carry on business specified in D7;
  - (ii) evidence of the workers compensation coverage specified in C6.15;
  - (iii) the twenty-four (24) hour emergency response phone number specified in D4.2.
  - (iv) the Safe Work Plan specified in D8;
  - (v) evidence of the insurance specified in D9;
  - (vi) the performance security specified in D10;
  - (vii) the subcontractor list specified in D11;
  - (viii) the equipment list specified in D12; and
  - (ix) the detailed work schedule specified in D13; and
- (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

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

D14.4 The Contractor shall not commence Part B until he has fulfilled the Submittal requirements outlined in E8.

D14.5 The Contractor shall not commence Part E between Station 1+000 and 1+200 as described in D2 and the drawings, unless he has received notification from the Contract Administrator that there is adequate cover over the MTS concrete encased duct line.

### **D15. WORKING DAYS**

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

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

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

D15.1.3 When the Work includes two or more major types of Work that can be performed under different atmospheric conditions, the Contract Administrator shall consider all major types of Work in determining whether the Contractor was able to work in assessing Working Days.

## **D16. RESTRICTED WORK HOURS**

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

## **D17. WORK BY OTHERS**

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

- (a) Part A: Pembina Corridor – Pembina Hwy @ University Cres
  - (i) Removal of existing bus shelter by Transit Dept.
- (b) Part B: Pembina Corridor – Pembina Hwy @ Bishop Grandin Blvd E/B Off Ramp
  - (i) Improvements to existing “Jug Handle” bus stop by Transit Dept. Adjacent work area.
- (c) Part C: Pembina Corridor – Pembina Hwy @ Jubilee Ave
  - (i) Traffic signal pole and vehicle detector loop reinstallation by Traffic Signals Branch.
- (d) Part D: Pembina Corridor – Osborne St @ Corydon Ave
  - (i) Traffic signal pole and vehicle detector loop reinstallation by Traffic Signals Branch.
- (e) Part E: St. Mary’s Corridor – St. Mary’s Rd @ Bishop Grandin Blvd
  - (i) Removal and reinstallation of existing bus shelter by Transit Dept.
  - (ii) Traffic signal pole and vehicle detector loop reinstallation by Traffic Signals Branch.
  - (iii) Overhead hydro line relocation by Manitoba Hydro.
  - (iv) Pedestal relocation and manhole adjustment by MTS.
- (f) Part F: St. Mary’s Corridor – St. Mary’s Rd @ Dunkirk/Dakota
  - (i) Traffic signal pole and vehicle detector loop reinstallation by Traffic Signals Branch.
  - (ii) Overhead hydro line relocation by Manitoba Hydro.
- (g) Part G: St. Anne’s Corridor – St. Anne’s Rd @ Bishop Grandin Blvd
  - (i) Vehicle detector loop reinstallation by Traffic Signals Branch.
- (h) Part H: St. Anne’s Corridor – St. Anne’s Rd @ Fermor Ave
  - (i) Traffic signal pole and vehicle detector loop reinstallation by Traffic Signals Branch.
- (i) Part I: St. Anne’s Corridor – St. Anne’s Rd @ Kingswood Ave
  - (i) Traffic signal pole and vehicle detector loop reinstallation by Traffic Signals Branch.
- (j) Part J: All Corridors – Traffic Signal Installation Restorations
  - (i) Traffic signal pole, controller, detector loop, and underground conduit installation by Traffic Signals Branch.

## **D18. SEQUENCE OF WORK**

D18.1 Further to C6.1, the sequence of work shall comply with the following:

- D18.1.1 Providing that the Work at each Site is completed in a similar order to the order that the Work was commenced in, the Contractor will be permitted to have a maximum of four (4) Sites under construction at any one time. Completion of a Site means that all of the necessary concrete and asphalt works are completed to the satisfaction of the Contract Administrator. Landscaping and boulevard restoration works can overlap with additional Sites if the Contractor can show that progress is being made.
- (a) For the purposes of the work schedule, Part E & F, and H & I can each be considered one Site.
  - (b) Part J is excluded from the sequence of work as it is dependant upon Traffic Signals Branch work schedule.

- D18.1.2 Where the Contractor utilizes two (2) or more crews that work independently on the same major component of the Work as identified in D2, the Contract Administrator may approve an increase to the maximum number of Sites under construction at any time.
- D18.1.3 The order of construction, based on necessary utility work and completion requirements shall be as follows:
- (a) Part A: Pembina Corridor – Pembina Hwy @ University Cres
  - (b) Part B: Pembina Corridor – Pembina Hwy @ Bishop Grandin Blvd E/B Off Ramp
  - (c) Part C: Pembina Corridor – Pembina Hwy @ Jubilee Ave
  - (d) Part D: Pembina Corridor – Osborne St @ Corydon Ave
  - (e) Part H & I: St. Anne's Corridor – St. Anne's Rd @ Fermor Ave & Kingswood Ave
  - (f) Part G: St. Anne's Corridor – St. Anne's Rd @ Bishop Grandin Blvd
  - (g) Part E & F: St. Mary's Corridor – St. Mary's Rd @ Bishop Grandin & Dunkirk/Dakota

## **D19. SUBSTANTIAL PERFORMANCE**

- D19.1 The Contractor shall achieve Substantial Performance within forty-two (42) consecutive Working Days of the commencement of the Work as specified in D14.
- D19.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D19.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

## **D20. TOTAL PERFORMANCE**

- D20.1 The Contractor shall achieve Total Performance within forty-five (45) consecutive Working Days of the commencement of the Work as specified in D14.
- D20.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D20.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

## **D21. LIQUIDATED DAMAGES**

- D21.1 If the Contractor fails to achieve Total Performance in accordance with the Contract by the day fixed herein for Total Performance, the Contractor shall pay the City one thousand, eight hundred dollars (\$1,800) per Working Day for each and every Working Day following the day fixed herein for Total Performance during which such failure continues.
- D21.2 The amount specified for liquidated damages in D21.1 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.
- D21.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

## **D22. SCHEDULED MAINTENANCE AND TRAFFIC SIGNAL INSTALLATION RESTORATIONS**

- D22.1 The Contractor shall perform the following scheduled maintenance and concrete restorations in the manner and within the time periods required by the Specifications:
- (a) Reflective Crack Maintenance (during one year warranty period) as specified in CW 3250;
  - (b) Sodding (Maintenance Period) as specified in CW 3510;
  - (c) Part J: Concrete restorations after Traffic Signals Branch installations within two weeks at each Site.
- D22.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance and Part J work identified herein. All scheduled maintenance and Part J work shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance or Part J work 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 or Part J work.

## **CONTROL OF WORK**

### **D23. JOB MEETINGS**

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

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

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

## **WARRANTY**

### **D25. WARRANTY**

- D25.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire one (1) year thereafter unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.
- D25.2 Notwithstanding C13.2 or D25.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if:
- (a) a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.
- D25.2.1 In such case the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

**FORM H1: PERFORMANCE BOND**  
(See D10)

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 dated the

\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, for:

**BID OPPORTUNITY NO. 513-2007**

The City of Winnipeg Transit Department – On Street Transit Priority Improvements –Phase I 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)

\_\_\_\_\_  
(Name of Principal)

Per: \_\_\_\_\_ (Seal)

Per: \_\_\_\_\_

\_\_\_\_\_  
(Name of Surety)

By: \_\_\_\_\_ (Seal)  
(Attorney-in-Fact)

**FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT  
(PERFORMANCE SECURITY)**  
(See D10)

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

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

RE: PERFORMANCE SECURITY – BID OPPORTUNITY NO. 513-2007

The City of Winnipeg Transit Department – On Street Transit Priority Improvements –Phase I

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

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

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

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

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

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

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

Partial drawings are permitted.

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

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

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



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

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

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

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

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

This credit is subject to the Uniform Customs and Practice for Documentary Credit (1993 Revision), International Chamber of Commerce Publication Number 500.

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

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

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



**FORM K: EQUIPMENT**  
(See D12)

The City of Winnipeg Transit Department – On Street Transit Priority Improvements –Phase I

<p><b>1. Category/type: Asphalt Planing</b></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><b>2. Category/type: Concrete Restoration and Concrete Paving (Including Curbing)</b></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><b>3. Category/type: Asphalt Paving</b></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 D12)

The City of Winnipeg Transit Department – On Street Transit Priority Improvements –Phase I

**4. Category/type: All Equipment working in vicinity of Fort Garry-St. Vital Feedermain**  
List all significant equipment (backhoes, typical haul trucks, concrete slip form paver, etc.) that will be in vicinity of feedermain in Part B of the work as per E8. Additional sheets or equipment diagrams can be used to supplement.

Equipment Type: \_\_\_\_\_ Make/Model: \_\_\_\_\_

Tare (Operating) Weight: \_\_\_\_\_ Payload Weight: \_\_\_\_\_

Equipment axle and load configuration (text or diagram):  
\_\_\_\_\_  
\_\_\_\_\_

Equipment Type: \_\_\_\_\_ Make/Model: \_\_\_\_\_

Tare (Operating) Weight: \_\_\_\_\_ Payload Weight: \_\_\_\_\_

Equipment axle and load configuration (text or diagram):  
\_\_\_\_\_  
\_\_\_\_\_

Equipment Type: \_\_\_\_\_ Make/Model: \_\_\_\_\_

Tare (Operating) Weight: \_\_\_\_\_ Payload Weight: \_\_\_\_\_

Equipment axle and load configuration (text or diagram):  
\_\_\_\_\_  
\_\_\_\_\_

Equipment Type: \_\_\_\_\_ Make/Model: \_\_\_\_\_

Tare (Operating) Weight: \_\_\_\_\_ Payload Weight: \_\_\_\_\_

Equipment axle and load configuration (text or diagram):  
\_\_\_\_\_  
\_\_\_\_\_

Equipment Type: \_\_\_\_\_ Make/Model: \_\_\_\_\_

Tare (Operating) Weight: \_\_\_\_\_ Payload Weight: \_\_\_\_\_

Equipment axle and load configuration (text or diagram):  
\_\_\_\_\_  
\_\_\_\_\_

**FORM L: DETAILED WORK SCHEDULE**  
 (See D12)

The City of Winnipeg Transit Department – On Street Transit Priority Improvements –Phase I

For each item of Work, indicate the cumulative percentage proposed to be completed by the end of each time period until 100% completion is achieved.						
Items of Work	Time Period in Working Days					
	0	10	20	30	42	45
Part A: Pembina Corridor – Pembina Hwy @ University Cres						
Part B: Pembina Corridor – Pembina Hwy @ Bishop Grandin Blvd E/B Off Ramp						
Part C: Pembina Corridor – Pembina Hwy @ Jubilee Ave						
Part D: Pembina Corridor – Osborne St @ Corydon Ave						
Part E: St. Mary's Corridor – St. Mary's Rd @ Bishop Grandin Blvd						
Part F: St. Mary's Corridor – St. Mary's Rd @ Dunkirk/Dakota						
Part G: St. Anne's Corridor – St. Anne's Rd @ Bishop Grandin Blvd						
Part H: St. Anne's Corridor – St. Anne's Rd @ Fermor Ave						
Part I: St. Anne's Corridor – St. Anne's Rd @ Kingswood A						
Part J: All Corridors – Traffic Signal Installation Restorations	(Restorations within two weeks of Traffic Signals Branch work at each site)					

## 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 Branch internet site at <http://www.winnipeg.ca/matmgt>.

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>Sheet No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
--	Cover Sheet	A1
1	Pembina Corridor – Pembina Hwy @ University Cres	A1
2	Pembina Corridor – Pembina Hwy @ Bishop Grandin Blvd E/B Off Ramp	A1
3	Pembina Corridor – Pembina Hwy @ Jubilee Ave	A1
4	Pembina Corridor – Osborne St @ Corydon Ave	A1
5	St Mary's Corridor – St Mary's Rd @ Bishop Grandin Blvd	A1
6	St Mary's Corridor – St Mary's Rd @ Bishop Grandin Blvd	A1
7	St Mary's Corridor – St Mary's Rd @ Bishop Grandin Blvd	A1
8	St Mary's Corridor – St Mary's Rd @ Dunkirk/Dakota	A1
9	St Anne's Corridor – St Anne's Rd @ Bishop Grandin Blvd	A1
10	St Anne's Corridor – St Anne's Rd @ Fermor Ave	A1
11	St Anne's Corridor – St Anne's Rd @ Kingswood Ave	A1
12	Standard Details – Cross Sections	A1
13	Balanced Aluminum Shoulder Barrier – Layout	A1
14	Balanced Aluminum Shoulder Barrier – Standard Detail	A1

#### E2. PROTECTION OF EXISTING TREES

E2.1 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing boulevard trees within the limits of the construction area:

- (a) The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of trees.
- (b) Trees identified to be at risk by the Contract Administrator are to be strapped with 25 x 100 x 2400mm wood planks, or suitably protected as approved by the Contract Administrator.
- (c) Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 1.5 times the diameter (measured in inches), with the outcome read in feet, from the closest edge of the trunk. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.
- (d) Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform the work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface

directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.

- (e) Work on-site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.

E2.2 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his designate.

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

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

### **E3. TRAFFIC CONTROL**

E3.1 Further to clauses 3.6 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. No measurement for payment will be made for this work.
- (b) In accordance with the Manual of Temporary Traffic Control, the Contractor ("Agency" in the manual) shall make arrangements with the Traffic Services Section 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 Section of the City of Winnipeg in connection with the works undertaken by the Contractor.

### **E4. TRAFFIC MANAGEMENT**

E4.1 Further to clause 3.7 of CW 1130-R1:

E4.1.1 The Contractor may close the lane adjacent to the lane under construction to facilitate equipment staging and loading except as follows:

- (a) Part A: No restriction on adjacent lane closure.
- (b) Part B: The Bishop Grandin Off Ramp must be open to traffic at all times. The bus stop "jug handle" must be open to buses at all times.
- (c) Part C: The adjacent lane shall not be closed between 0700 – 0900 hours.
- (d) Part D: The adjacent lane shall not be closed between 0700 – 0900 hours.
- (e) Part E: No restriction on adjacent lane closure.
- (f) Part F: No restriction on adjacent lane closure.
- (g) Part G: At least 35 metres of storage from the bullnose shall be maintained in the adjacent left turn storage lane at all times, except for short durations as approved by the Contract Administrator.
- (h) Part H: No restriction on adjacent lane closure.
- (i) Part I: No restriction on adjacent lane closure.
- (j) Part J: No restriction on adjacent lane closure, unless otherwise instructed by the Contract Administrator.

E4.1.2 When no work is being performed on a particular Part of the project, and providing it is safe for vehicles, adjacent lane closures will not be permitted, unless written consent is given by the Contract Administrator. It is expected that most Parts of the work should have the adjacent lane open when no work is being performed.

E4.1.3 The Contractor shall review access from the three affected private approaches in Part A to University Crescent with the residents and take reasonable measures to minimize the

impact. The Contractor shall provide a minimum of 24 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.

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

## **E5. PEDESTRIAN SAFETY**

E5.1 During the project, a temporary snow fence shall be installed if necessary in locations where open excavations are adjacent to pedestrian facilities.. The Contractor shall be responsible for maintaining the snow fence in a proper working condition. No measurement for payment shall be made for this work.

## **E6. WATER USED BY CONTRACTOR**

E6.1 Further to clause 3.7 of CW 1120-R1, the Contractor shall pay for all costs associated with obtaining water in accordance with the Waterworks By-law. Sewer charges will not be assessed for water obtained from a hydrant.

## **E7. SURFACE RESTORATIONS**

E7.1 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.

## **E8. OPERATING CONSTRAINTS FOR WORK IN CLOSE PROXIMITY TO THE FORT GARRY-ST.VITAL FEEDERMAIN**

E8.1 Description

E8.1.1 This Section details operating constraints for all work to be carried out in close proximity to the Fort Garry-St. Vital Feedermain. Close proximity shall be deemed to be any construction activity within a 5 m offset from the centreline of the feedermain.

E8.2 General Considerations for Work in Close Proximity to the Fort Garry-St. Vital Feedermain

E8.2.1 The Fort Garry-St. Vital Feedermain is a critical component of the City of Winnipeg Regional Water Supply System and work in proximity to it shall be undertaken with an abundance of caution. The pipe cannot be taken out of service to facilitate construction and inadvertent damage caused to the pipe would likely have catastrophic consequences.

Work around the Feedermain shall be planned and implemented to minimize the time period that work is carried out in close proximity to it and to ensure that the pipelines are not subjected to excessive construction related loads, including excessive vibrations and/or concentrated or asymmetrical lateral loads during backfill placement.

E8.2.2 The Fort Garry Feedermain is constructed of Prestressed Concrete Cylinder Pipe conforming to AWWA Standard C301, which was manufactured and installed in 1988. AWWA C301 pipe has limited ability to withstand increased earth and live loading. Therefore, every precaution must be undertaken to ensure that applied loading during all phases of construction is within accepted loading parameters.

Loading limitations and calculated loads associated with typical construction equipment is attached to this specification as Appendix A. The loading calculations shall be interpreted with caution, however, as many factors can cause applied loads to vary considerably, such as unbalanced loading, variations in wheel base or track width, payload, impact factors due to excessive speed or vibration, etc.

E8.3 Submittals



- E8.3.1 Submit proposed construction equipment specifications to the Contract Administrator for review seven (7) days prior to construction. Submittal shall include;
- (a) Equipment operating weight and dimensions including wheel or track base, track length or axle spacings, track widths or wheel configurations
  - (b) Payload weights
  - (c) Load distributions in the intended operating configuration
- E8.3.2 Submit a Construction Method Statement with proposed construction plan including haul routes, excavation equipment locations, loading positioning and base construction sequencing to the Contract Administrator for review seven (7) days prior to construction. Do not commence construction until Method Statement has been reviewed and accepted by the Contract Administrator.
- E8.4 Protection of the Feedermain During Construction
- E8.4.1 Contractors carrying out repair work or working in the vicinity of feeder mains shall meet the following conditions and technical requirements:
- (a) Planning and General Execution
    - (i) No work shall commence at the Site until the Construction Method Statement has been accepted and the feeder main location has been clearly delineated in the field.
    - (ii) Work shall only be carried out with equipment that has been reviewed and quantified in terms of its loading implications by the Contract Administrator.
    - (iii) For transverse crossing of the feeder main, designate crossing locations and confine equipment crossing the pipe(s) to these location. Reduce equipment speeds to levels that minimize the impacts of impact loading.
    - (iv) For construction work activities either longitudinally or transverse to the alignment of the feeder main, work only with equipment and in the manner stipulated in the accepted Construction Method Statement and the supplemental requirements noted herein.
    - (v) Subgrade, subbase and base construction shall be kept in a rut free condition at all times. Construction equipment is prohibited from crossing pipelines if the grade is insufficient to support the equipment without rutting.
    - (vi) Granular material, construction material, soil or other material shall not stockpiled on the pipelines or within 5 metres of the pipe centerline.
    - (vii) Stage construction such that the feeder main is not subjected to significant asymmetrical loading at any time.
    - (viii) Where work is in proximity to the feeder main, utilize construction practices and procedures that do not impart excessive vibration loads on the feeder main or that would cause settlement of the subgrade below the feeder main.
  - (b) Excavation
    - (i) Where there is less than 1.5 metres of earth cover over the feeder main and further excavation is required either adjacent to or over the feeder main, utilize only smooth edged excavation buckets, soft excavation or hand excavation techniques.
    - (ii) Where there is less than 2.0 m of cover over the feeder main, offset backhoe from feeder main a minimum of 2.5 m from feeder main centerline, to carry out excavation.
    - (iii) Excavated materials intended for reuse shall not be dumped directly on pipelines, but shall be carefully bladed in place.
  - (c) Subgrade Construction
    - (i) Subgrade compaction shall be limited to static compaction methods and only with equipment that are well within the rated loading superimposed loading capacity of the feeder main.

- (ii) Stage work activities to minimize the time period that unprotected subgrade is exposed to the environment and protect the subgrade against the impacts of adverse weather if subbase/ base course construction activities are not sequential with excavation.
  - (d) Subbase and Base Course Construction
    - (i) Subbase, base or excavation materials shall not be dumped directly on pipelines but shall be carefully bladed in-place.
    - (ii) Subbase compaction shall be either carried out by static methods without vibration or with smaller approved equipment such as hand held plate packers or smaller roller equipment.
- E8.4.2 The Contractor shall ensure that all work crew members understand and observe the requirements of this specification. Prior to commencement of on-site work, the Contractor shall jointly conduct an orientation meeting with the Contractor Administrator with all superintendents, foremen and heavy equipment operators to make all workers on Site fully cognizant of the limitations of altered loading on the feedermain, the ramifications of inadvertent damage to the pipe, the constraints associated with work in close proximity to the feedermain and the specific details of the Construction Method Statement in instances where a Construction Method Statement is in effect.
- E8.4.3 Employees of the Contractor or any Subcontractor that fail to comply with the conditions for working in close proximity to the feedermain shall be promptly removed from the Site.

## **E9. REMOVAL OF INTERLOCKING PAVING STONES AND LEAN CONCRETE BASE**

### E9.1 Description

#### E9.1.1 General

- (a) This specification covers the removal of existing interlocking paving stones and the underlying lean concrete base.
- (b) Referenced Standard Construction Specifications
  - (i) CW 3235 – Renewal of Existing Miscellaneous Concrete Slabs
  - (ii) CW 3335 – Installation of Interlocking Paving Stones on a Lean Concrete Base

### E9.2 Materials and Equipment

#### E9.2.1 Not Applicable

### E9.3 Construction Methods

#### E9.3.1 Removing Existing Interlocking Paving Stones

- (a) Salvage intact existing interlocking paving stones that are clean and free of markings. Only full size, uncut stone shall be salvaged.
- (b) Remove and salvage paving stones to location shown on drawings or as directed by Contract Administrator.
- (c) Stockpile paving stones in stacked piles for future reinstallation. Wrap piles with plastic film or other methods to maintain site cleanliness.
- (d) Dispose of unused paving stones after reinstallation.

#### E9.3.2 Removing Existing Lean Concrete Base

- (a) Remove as per Section 3.1 of CW 3235.

### E9.4 Measurement and Payment

#### E9.4.1 Removing Existing Interlocking Paving Stones

- (a) Removing Existing Interlocking Paving Stones will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Removing Existing

Interlocking Paving Stones”. The area to be paid for will be the total area of paving stones removed and stockpiled in accordance with this specification and accepted by the Contract Administrator.

E9.4.2 Removing Existing Lean Concrete Base

- (a) Removing Existing Lean Concrete Base will be measured on an area basis and paid for at the Contract Unit Price per square metre for “Removing Existing Lean Concrete Base”. The area to be paid for will be the total area of lean concrete base removed and disposed of in accordance with this specification and accepted by the Contract Administrator.

**E10. UNIT PAVER INSERT AND BUS STOP FLAG FOUNDATION**

E10.1 Description

E10.1.1 General

- (a) This specification covers the construction of paving stone insert in concrete sidewalk to delineate a Transit bus stop and construction of a concrete pile foundation to support a bus stop sign (supplied by others).
- (b) Referenced Standard Construction Specifications
  - (i) CW 3310 – Portland Cement Concrete Pavement Works
  - (ii) CW 3335 – Installation of Interlocking Paving Stones on a Lean Concrete Base

E10.2 Materials and Equipment

E10.2.1 Flag Foundation Concrete

- (a) Cement: Type 50
- (b) Min Compressive Strength at 28 days: +25 MPa
- (c) Class of Exposure: S-2
- (d) Slump: 90 mm +/- 20 mm
- (e) Air Content: 5 – 8%

E10.2.2 Flag Foundation Materials

- (a) Other materials as per Drawing in Appendix B.

E10.2.3 Unit Pavers (Interlocking Paving Stones)

- (a) Blue Holland Stone Pavers 105\*210\*60 mm

E10.2.4 Bedding and Filler Sand

- (a) As per Section 5 of CW 3335.

E10.3 Construction Methods

E10.3.1 Flag Foundation

- (a) Construct flag foundation as detailed on the drawings and Appendix B.
- (b) Excavate sub-grade to line and grade as shown on the drawings and Appendix B.
- (c) The reinforcing cage shall be placed in the foundation excavation prior to placement of concrete. Spacers shall be provided to keep the reinforcing cage in its correct location. Reinforcement shall be formed accurately and secured in foundation shaft to its correct location.
- (d) Reinforcement shall be clean, and free from all coatings including ice, loose rust, dried concrete, or soil.
- (e) Reinforcing bars kinked, twisted, bent past a right angle, or reduced in cross section will be rejected.

- (f) Concrete consistency shall be such that concrete works readily into corners and around reinforcement without segregation of materials or the collection of free water on the surface.
- (g) Do not place concrete until foundation has been inspected.
- (h) Concrete placing shall be continuous from bottom to top of foundation, and puddling or rodding or mechanical vibration carried on constantly to remove voids and produce a uniform, homogenous structure.
- (i) Install anchor bolts supplied by Contract Administrator during concrete placement. Ensure correct bolt spacing is maintained.
- (j) Finish exposed foundation top smooth and level.
- (k) Exposed surface of foundation to be kept moist for seven days after placement and temperature of the concrete maintained above 10 C.
- (l) The protection of concrete and concreting operations during extreme cold or hot weather as per CSA A23.1.
- (m) Protect the top of the foundation and anchor bolts from damage by backfilling top of foundation with bedding sand or base course until flag is installed by others.

**E10.3.2 Unit Pavers (Interlocking Paving Stones)**

- (a) Construct concrete sidewalk and unit pavers as per the drawings and CW 3335.
- (b) Construct concrete sidewalk monolithically with adjacent concrete sidewalk.
- (c) Natural Holland Pavers over the flag foundation to be supplied and installed by others.

**E10.4 Measurement and Payment**

**E10.4.1 Unit Paver Insert and Bus Stop Flag Foundation**

- (a) Unit Paver Insert and Bus Stop Flag Foundation will be measured on a unit basis and paid for at the Contract Unit Price for each "Unit Paver Insert and Bus Stop Flag Foundation". The number to be paid for will be the total number constructed in accordance with this specification and accepted by the Contract Administrator.

**E11. CONSTRUCTION OF TINTED CONCRETE**

**E11.1 Description**

**E11.1.1 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) Referenced Standard Construction Specifications
  - (i) CW 3310 – Portland Cement Concrete Pavement Works

**E11.2 Materials and Equipment**

**E11.2.1 Concrete Materials**

- (a) The Contractor shall base the tinted concrete mix on a mix design that has been approved for the 2007 construction season by the City of Winnipeg Research and Standards Engineer.
- (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.

#### E11.2.2 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
  - (iii) RG-2827R Baja Red (1 bag) supplied through Interstar
  - (iv) Baja Red supplied through Davis Colors
- (c) Contractor to cast one colored concrete sample minimum 200 mm \* 200 mm in area using base concrete mix for approval by Contract Administrator. Sample to be cured a minimum of 7 days before presentation to 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.

#### E11.2.3 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.

#### E11.2.4 Liquid Membrane-Forming Curing Compound

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

#### E11.2.5 Other Materials

- (a) All other materials as per CW 3310.

#### E11.2.6 Floating and Finishing Equipment

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

#### E11.2.7 Other Equipment

- (a) All other equipment as per CW 3310.

### E11.3 Construction Methods

#### E11.3.1 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.
- (c) Clean finishing tools and equipment and let dry prior to finishing. Wet tools will fade the coloring. 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 color.

- (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.

#### E11.4 Measurement and Payment

##### E11.4.1 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 the "Items of Work" listed below. The area to be paid for will be the total number of square metres of tinted concrete supplied and placed at grade, or below an asphalt overlay in accordance with this specification and accepted by the Contract Administrator.

Items of Work:

Concrete Pavements, Median Slabs, Bull-noses, and Safety Medians

- (i) Construction of 230 mm Concrete Pavement (Plain-Dowelled, Tinted)
- (ii) Construction of 200 mm Concrete Pavement (Plain-Dowelled, Tinted)

## E12. ASPHALT TIE-INS AND PATCHING ADJACENT TO AT GRADE TINTED CONCRETE

### E12.1 Description

#### E12.1.1 General

- (a) This specification alters the scope of tie-ins and approaches to include asphalt patching next to at-grade tinted concrete. This patching is required to restore the riding surface adjacent to headers constructed as shown in the drawings.
- (b) Referenced Standard Construction Specifications
  - (i) CW 3410 – Asphaltic Concrete Pavement Works

### E12.2 Materials and Equipment

#### E12.2.1 Asphalt Materials

- (a) Type 1A as per Section 5 and 6 of CW 3410.

#### E12.2.2 Equipment

- (a) Equipment as per Section 8 of CW 3410.

### E12.3 Construction Methods

#### E12.3.1 General

- (a) Placement of asphalt tie-ins as per Section 9 of CW 3410.
- (b) Place asphalt overlay patches adjacent to at grade colored concrete using construction methods in Section 9 of CW 3410 in locations generally shown on the construction drawings.
- (c) Asphalt overlay patches shall be placed by hand methods and compacted with mechanical rollers.

### E12.4 Measurement and Payment

#### E12.4.1 Asphalt Tie-Ins and Patching Adjacent to At Grade Tinted Concrete

- (a) Asphalt Tie-Ins and Patching Adjacent to At Grade Tinted Concrete will be measured on a weight basis and paid for at the Contract Unit Price per tonne for "Tie-Ins and Patches". The weight to be paid for will be the total number of tonnes of asphalt placed and compacted in accordance with this specification and accepted by the Contract Administrator, as measured on a certified weigh scale.

## **E13. RELOCATE PLANTERS**

### E13.1 Description

#### E13.1.1 General

- (a) This specification covers the temporary removal, storage, and replacement of existing frangible planters for Part C of the Work.

### E13.2 Materials and Equipment

#### E13.2.1 Not applicable

### E13.3 Construction Methods

#### E13.3.1 General

- (a) Prior to bullnose removal, relocate existing frangible planters to grassed area on Jubilee traffic island away from work area. Care should be taken to retain as much soil in the planters as possible.
- (b) After construction of bullnose is complete and concrete has a minimum compressive strength of 20 MPa, place frangible planters to approximate location shown on the drawings. Care should be taken not to drag planters over the concrete surface.

### E13.4 Measurement and Payment

#### E13.4.1 Relocate Planters

- (a) Relocating Planters will be measured on a unit basis and paid for at the Contract Unit Price per unit for "Relocate Planters". The number to be paid for will be the total number of units temporarily removed and replaced in accordance with this specification and accepted by the Contract Administrator.

## **E14. RENEWAL OF LEAN CONCRETE BASE**

### E14.1 Description

#### E14.1.1 General

- (a) This specification covers the removal and installation of new lean concrete base for use under interlocking paving stones.
- (b) Referenced Standard Construction Specifications
  - (i) CW 3235 – Renewal of Existing Miscellaneous Concrete Slabs
  - (ii) CW 3335 – Installation of Interlocking Paving Stones on a Lean Concrete Base

### E14.2 Materials and Equipment

#### E14.2.1 Lean Concrete Mix

- (a) As per Section 5 of CW 3335.

### E14.3 Construction Methods

#### E14.3.1 Removal of Existing Lean Concrete Base

- (a) After removal of existing paving stones, excavate the lean concrete base as per Section 3.1 of CW 3235.

#### E14.3.2 Lean Concrete Base Installation

- (a) Install lean concrete base as per Section 9 of CW 3335.

### E14.4 Measurement and Payment

#### E14.4.1 Renewal of Lean Concrete Base

- (a) Renewal of Lean Concrete Base will be measured on an area basis and paid for at the Contract Unit Price per square metre for "Renewal of Lean Concrete Base". The weight to be paid for will be the total area of lean concrete base removed and replaced in accordance with this specification and accepted by the Contract Administrator.

## **E15. SUPPLYING AND PLACING REINFORCING STEEL**

### **E15.1 Description**

This Specification shall cover the supply, fabrication, and placement of plain reinforcing steel for the structural retaining wall as part of Part E of the Work.

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.

### **E15.2 Materials**

#### **E15.2.1 General**

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

#### **E15.2.2 Handling and Storage of Materials**

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.

#### **E15.2.3 Reinforcing Steel**

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

All reinforcing steel shall conform to the requirements of the latest edition of CSA Standard G30.18, Grade 400W, Billet-Steel Bars for Concrete Reinforcement. If, in the opinion of the Contract Administrator, any reinforcing steel provided for the concrete works exhibit flaws in manufacture or fabrication, such material shall be immediately removed from the Site and replaced with acceptable reinforcing steel.

All reinforcing steel shall be straight and free from paint, oil, millscale, and injurious defects. Rust, surface seams, or surface irregularities will not be cause for rejection, provided that the minimum dimensions, cross sectional area, and tensile properties of a hand-wire-brushed specimen are not less than the requirements of the latest edition of CSA Standard G30.18.

#### **E15.2.4 Bar Accessories**

Bar accessories shall be of a type approved by the Contract Administrator and shall be non-rusting. They shall be made from Type 316 stainless steel or hot-dip galvanized steel, or, in the case of chairs, from High Performance Concrete (HPC). An approved HPC rebar support is supplied by Con Sys Inc. of Pinawa, Manitoba, phone: 753-2404, fax: 753-8329. They shall not stain, blemish, or spall the concreted surface for the life of the concrete.

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. The supplying and installation of bar accessories shall be deemed to be incidental to the supplying and placing of reinforcing steel.

#### **E15.2.5 Reinforcing Steel Shop Drawings**

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. Do 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.

#### E15.2.6 Bonding Agent

Epoxy resin shall be of a type listed in the "Approved Products for Surface Works" as part of the City of Winnipeg Standard Construction Specifications. Epoxy resin shall conform to the requirements of ASTM Standard C881. Type 1, Grade 3 epoxy shall be used for bonding reinforcing steel into hardened concrete.

Bonding agents for bonding reinforcing steel into holes in hardened concrete other than epoxy resin may be permitted provided that they develop a minimum pullout resistance of 50 kN within 48 hours after installation. Alternative bonding agents are listed in the approved products list.

#### E15.3 Construction Methods

##### E15.3.1 Fabrication of Reinforcing Steel

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

##### E15.3.2 Placing of Reinforcing Steel

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 so that the bars shall not be moved out of alignment during or after the depositing of concrete. The Contract Administrator's decision in this matter shall be final.

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.

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 must be made. Welded splices shall conform to CSA Standard W186, and are subject to prior written approval of the Contract Administrator.

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 the placing of any concrete to allow for inspection of the reinforcement.

##### E15.3.3 Installing Reinforcing Steel into Hardened Concrete

If shown on the drawings, the Contractor shall drill holes into adjacent slabs or retaining walls for dowels and tie bars of the diameters and depths shown on the drawings. Drill bits shall have a diameter no larger than 2 mm larger than the nominal dowel or tie bar diameter.

Holes shall be located to the correct depth and alignment as indicated on the drawings.

Drilling equipment shall be operated so as to ensure that no damage to the pavement results from such drilling operation. Coring of holes is not permitted. In the event that existing reinforcing steel bars are hit during the drilling operations, that hole shall be

abandoned and a new hole shall be drilled nearby to the correct depth. All abandoned holes shall be filled with non-shrink grout.

Holes for reinforcing steel shall be blown clean with compressed air. Bonding agent shall be placed in the back of the drilled hole. The reinforcing steel shall be worked back into the hole for complete coverage around the portion of the bar that extends into the hole, such that bonding agent is squeezed from the hole.

Once all reinforcing steel is in position, it shall be inspected and approved by the Contract Administrator before a new concrete is placed. Otherwise, the concrete may be rejected by the Contract Administrator and shall be removed by the Contractor at his own expense.

#### E15.4 Quality Control

##### E15.4.1 Inspection

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.

##### E15.4.2 Access

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

##### E15.4.3 Quality Testing

Quality control testing will be used to determine the acceptability of the reinforcing steel supplied by the Contractor.

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.

#### E15.5 Method of Measurement

##### E15.5.1 Supplying and Placing Reinforcing Steel

The supplying and placing reinforcing steel will be measured on a mass basis. The mass to be paid for shall be the total number of kilograms of reinforcing steel installed in accordance with this Specification, acceptable to the Contract Administrator, as computed from the approved reinforcing layout shown on the Drawings, excluding the mass of bar accessories.

#### E15.6 Basis of Payment

##### E15.6.1 Supplying and Placing Reinforcing Steel

The supplying and placing of reinforcing steel shall be paid for at the Contract Unit Price per kilogram for the "Supply and Place Reinforcing Steel - Plain," measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification.

## **E16. STRUCTURAL CONCRETE**

### **E16.1 Description**

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 part of the retaining wall in Part E of the Work.

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 performances and completion of all Work as hereinafter specified.

Referenced Standard Construction Specifications: CW 3310 – Portland Cement Concrete Pavement Works

### **E16.2 Materials**

#### **E16.2.1 Concrete Materials**

Type 2 mix as per Section 6.2 of CW 3310.

#### **E16.2.2 Admixtures**

No admixtures other than air-entraining and water-reducing agent shall be used without the written authorization of the Contract Administrator, unless otherwise specified in these Specifications. It shall be the Contractor's responsibility to ensure that any admixture is compatible with all other constituent materials.

##### **(a) Air-Entraining Agent**

The air-entraining agent shall conform to the requirements of CSA Standard CAN3-A266.1 and shall produce a satisfactory air-void system and an air content within the ranges specified in CSA Standard CAN/CSA-A23.1 for each class of concrete.

##### **(b) Water-Reducing Agent**

Water-reducing agent shall be Type WN and shall conform to the requirements of CSA Standard CAN3-A266.2.

##### **(c) Superplasticizing Agent**

If the Contract Administrator authorizes the use of a superplasticizing agent, the superplasticizing agent shall conform to the requirements of CSA Standard CAN3-A266.5 and CAN3-A266.6. The agent shall be free of chlorides and shall not affect the air-entraining agent's ability to produce a satisfactory air-void system.

##### **(d) Other Admixtures**

No other admixtures will be authorized for use in structural concrete, unless authorized in writing by the Contract Administrator.

#### **E16.2.3 Latex Bonding Agent**

Latex bonding agent shall be ACRL-STIX as supplied by Specialty Construction Products or equal as approved by the Contract Administrator.

#### **E16.2.4 Fibre Joint Filler**

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 equal as approved by the Contract Administrator.

E16.2.5 Form Coating

Form coating shall be "Sternson CRA," or "SCP Strip Ease" or equal as approved by the Contract Administrator.

E16.2.6 Patching Mortar

The patching mortar shall be made of the same 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 less than 1 part cement to 2 1/2 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 and bonding agent shall be no more than necessary for handling or placing.

E16.2.7 Cement Slurry Bonding Grout

Cement slurry bonding grout shall be a mixture of one part cement and one part sand, mixed with enough water and latex bonding agent (mixed in equal parts) to allow the slurry mixture to be brushed onto the existing concrete surfaces.

E16.2.8 Formwork

Formwork materials shall conform to CSA Standard CAN/CSA-A23.1 and American Concrete Institute Publication SP:4, "Formwork for Concrete."

No formwork accessories will normally be allowed to be left in place within 50 mm of the surface following form removal. However, if the Contract Administrator does permit these items to be left in place, they 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.

Boards used for formwork shall be fully seasoned and free from defects that may mar the surface, such as knots, warps, cracks, etc.

Forms for exposed surfaces that do not require a formliner shall be new plywood or steel as authorized by the Contract Administrator.

Studding shall be spruce or pine and shall have such dimensions and spacing that they shall withstand without distortion, all the forces to which the forms will be subjected.

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.

Walers shall be spruce or pine, with minimum dimension of 100 mm x 150 mm.

E16.2.9 Plain Formliner

Plain formliner shall be Drainaform as supplied by Brock White, or equal as accepted by the Contract Administrator. This formliner shall be used on all exposed formed surfaces.

E16.2.10 Curing Blankets

Curing blankets for wet curing shall be 100 percent polyester, 3 mm thick, curing blankets, white in colour. An approved product is "Mirafi Geotextile P150" or equal as approved by the Contract Administrator.

E16.2.11 Dampproofing

Dampproofing materials shall be applied to all buried surfaces in contact with the soil to within 300 mm of Finish Ground Elevation, with the exception of those surfaces cast directly against the soil or in contact with prefabricated drainage composite or wrapped in polyethylene film. Dampproofing materials shall be mineral colloid emulsified asphalt

complying with Canadian General Standards Board Specification No. 37-GP16M as per Bakelite/Flintguard 710-11 Foundation Coating as manufactured by Bakelite Thermosets Limited or equal accepted by Contract Administrator.

All damaged concrete, including tie holes to be filled with nonshrink grout prior to application of dampproofing.

Primer: Asphalt primer, penetrating type conforming to CGSB 37-GP-9M, as per Bakelite/Flintguard 910-01 Asphalt Primer as manufactured by Bakelite Thermosets Limited or equal as accepted by Contract Administrator.

#### E16.2.12 Non-Shrink Grout

The non-shrink grout shall be M-bed Standard by Sternson Ltd.; CPD non-shrink grout, Set non-shrink grout by Masterbuilders, Sika 212 Nonshrink Grout; or equal as approved by the Contract Administrator. The minimum compressive strength of the grout at 28 days shall be 40 MPa.

#### E16.2.13 Miscellaneous Materials

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

### E16.3 Construction Methods

#### E16.3.1 Formliners

Plain formliners shall be used on all exposed surfaces.

The supply and use of the plain formliner finish shall be considered incidental to the works of this Specification, and no additional payment will be made.

#### E16.3.2 Form Work and Shoring

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.

As a maximum, the following spacings shall apply, for studding and whaling:

20 mm plywood:	studding - 450 mm centre to centre
	walers - 760 mm centre to centre

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.

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.

All exposed edges shall be chamfered 25 mm for the substructure concrete works and 13 mm for the superstructure concrete works unless otherwise noted on the Drawings.

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 which are not shown on the structural drawings without the prior approval of the Contract Administrator.

Shores shall be provided with positive means of adjustment (jacks or wedges). All settlement shall be taken up before or during concreting as required.

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.

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.

The loads and lateral pressures outlined in Part 3, Section 102 of "Recommended Practice for Concrete Formwork," (ACI 347) and wind loads as specified by the National Building Code shall be used for design. Additional design considerations concerning factors of safety for formwork elements and allowable settlements outlined in Section 103 of the above reference shall apply.

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.

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.

Forms shall be constructed and maintained so that the completed work is within minus 3 mm or plus 6 mm of the dimensions shown on the Drawings.

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.

Forms shall be sufficiently tight to prevent leakage of grout or cement paste.

Form panels shall be constructed so that the contact edges are kept flush and aligned.

Where required by the Contract Administrator, the Contractor shall cast test panels not using less than two panels of representative samples of the forms he proposes for reuse and shall strip them after 48 hours for the Contract Administrator to judge the type of surface produced.

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.

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.

### E16.3.3 Placing Concrete

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, expansion joints, and related works. Placement without required prior notification will not be allowed.

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.

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.

The deck slab shall be placed by pumping methods.

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.

Placing of concrete, once started, shall be continuous. No concrete shall be placed against concrete that has sufficiently hardened to cause the formation of seams of "cold joints" within the section. If placing must be interrupted, construction joints shall be located where shown on the Drawings or as approved.

Concrete shall be placed as nearly as possible in its finish position. Rakes or mechanical vibrators shall not be used to transport concrete.

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.

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 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.

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.

Concrete shall not be placed during rain or snow, unless adequate protection is provided for formwork and concrete surfaces.

Before any concrete is placed in the approach slabs, the Contractor shall demonstrate to the satisfaction of the Contract Administrator before each pour that all necessary adjustments have been made to provide the required camber, crown, slab thickness, and concrete cover. This demonstration may be carried out by means of an attachment securely fastened to the finisher's strike-off machine and moving the machine and the strike-off across the deck over the reinforcing steel with a minimum 3 mm clearance between the steel and attachment.

#### E16.3.4 Finishing of Unformed Surfaces

All unformed concrete surfaces shall be finished as outlined hereinafter.

Screeding of all unformed concrete surfaces shall be performed by the sawing movement of a straightedge along wood or metal strips or form edges that have been accurately set at required elevations.

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.

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.

#### E16.3.5 General Curing

The use of curing compound will not be allowed on concrete areas that are to receive additional concrete or waterproofing.

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.

Unformed surfaces shall have curing compound applied immediately after the seven (7) day wet curing period.

Curing compounds shall be applied at the rate of not less than 4 m<sup>2</sup>/L. The compound must be applied uniformly and by roller. Spraying of the compound will not be permitted.

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.

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

Formed surfaces shall receive, immediately after stripping and patching, the same application of curing compound as finished surfaces.

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.

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.

#### E16.3.6 Form Removal

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.

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.

Field-cured test specimens, representative of the in-place concrete being stripped will be tested, as specified in this Specification, to verify the concrete strength.

#### E16.3.7 Patching of Formed Surfaces

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.

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.

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.

#### E16.3.8 Finishing of Formed Surfaces

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.

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.

#### E16.3.9 Cold Weather Concreting

The requirements of this section shall be applied to all concreting operations during cold weather; i.e. if the mean daily temperature falls below 5°C during placing or curing.

The Contract Administrator will advise the Contractor, as to the degree of heating of water and aggregates.

Supplementary equipment, as required below, shall be at the job Site if concrete is likely to be placed in cold weather.

Formwork and reinforcing steel shall be heated to at least 5°C before concrete is placed.

Concrete footings shall not be placed on frozen concrete, frozen soil or soil that has frozen and thawed. Other concrete members may be placed on subgrades that have been thawed, with the prior approval of the Contract Administrator.

The temperature of the concrete shall be maintained at not less than 10°C for seven days or 15°C for five days or 20°C for three days after placing. The concrete shall be kept above freezing temperature for at least a period of seven days. In no case shall the heating be removed until the concrete has reached a minimum compressive strength, which will be specified by the Contract Administrator for work under construction, and as determined from compressive strength tests for specimens secured under the same conditions as the concrete works in question.

Aggregates shall be heated to a temperature of not less than 20°C and not more than 65°C. Water shall be heated to a temperature between 55°C and 65°C. The temperature of the concrete at the time of placement shall be within the range specified in CSA Standard CAN/CSA-A23.1 for the thickness of the section being placed.

When the mean daily temperature may fall below 5°C, a complete hoarding of the Work, together with supplementary heat, shall be provided.

When the ambient temperature is below -15°C, the hoarding shall be constructed so as to allow the concrete to be placed without the hoarding having to be opened. If the mixing is done outside of the hoarding, the concrete shall be placed by means of hoppers installed through the hoarding. The hoppers are to be plugged when not in use.

When the ambient temperature is equal to or above -15°C, the Contractor will be permitted to open small portions of the hoarding for a limited time to facilitate the placing of the concrete.

Before depositing any of the concrete, the Contractor shall show that enough heating equipment is available to keep the air temperature surrounding the forms within the specified range. This shall be accomplished by bringing the temperature inside of the hoarding to the specified 20°C, at least 12 hours prior to the start of the concrete placing.

The Contractor shall supply all required heating apparatus and the necessary fuel. When dry heat is used, a means of maintaining atmospheric moisture shall be provided. The relative humidity within the heated enclosure shall be maintained at a minimum of 40 percent during concrete placing and finishing operations. Surface moisture evaporation rates shall not exceed the limits specified herein. Following finishing operations, exposed concrete surfaces shall be protected from excessive drying by applying curing compound, covering the surfaces with polyethylene, or providing water curing.

Sufficient standby heating equipment must be available to allow for any sudden drop in outside temperatures and any breakdowns which may occur in the equipment.

Combustion-type heaters may be used if their exhaust gases are vented outside the enclosures and not allowed to come into contact with concrete surfaces. Fire extinguishers must be readily at hand wherever combustion-type heaters are used.

The Contractor shall keep a curing record of each concrete pour. The curing record shall include: date and location of the pour, mean daily temperature, hoarding relative humidity, temperatures above and below the concrete surface at several points, and notes regarding the type of heating, enclosure, unusual weather conditions, etc. This record shall be available for inspection by the Contract Administrator at the end of the concrete operations.

#### E16.3.10 Hot Weather Concreting

##### (a) General

The requirements of this section shall be applied during hot weather; i.e. air temperatures above 25°C during placing.

Concrete shall be placed at as low a temperature as possible, preferably below 15°C, but not above 22°C. Aggregate stockpiles may be cooled by watersprays and sunshades.

Ice may be substituted for a portion of the mixing water, providing it has melted by the time mixing is completed.

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 watersprays.

Sunshades and wind breaks shall be used as required during placing and finishing.

Work shall be planned so that concrete can be placed as quickly as possible to avoid "cold joints."

The Contract Administrator's approval 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.

Curing shall follow immediately after the finishing operations.

##### (b) Hot-Weather Curing

When the air temperature is at or above 25°C, curing shall be accomplished by water spray or by using saturated absorptive fabric, in order to achieve cooling by evaporation. Mass concrete shall be water cured for the basic curing period when the air temperature is at or above 20°C, in order to minimize the temperature rise of the concrete.

(c) Job Preparation

When the air temperature is at or above 25°C, or when there is a 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 in E26.6.13, the formwork, reinforcement, and concreting equipment shall be protected from the direct rays of the sun or cooled by fogging and evaporation.

(d) Concrete Temperature

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, EC	
	Minimum	Maximum
Less than 0.3	10	35
0.3 to 1.0	10	30
1.0 to 2.0	5	25

(e) Protection From Drying

(i) Moderate Drying Conditions

When surface moisture evaporation exceeds 0.75 kg/m<sup>2</sup>/h, windbreaks shall be erected around the sides of the structural element.

(ii) Severe Drying Conditions

When surface moisture evaporation exceeds 1.0 kg/m<sup>2</sup>/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:

- a) Erecting sunshades over the concrete during finishing and placing operations.
- b) Lowering the concrete temperature.
- c) Increasing humidity by 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.
- d) Beginning the concrete curing immediately after towelling.

Placement of bridge deck concrete will not be permitted when the surface moisture evaporation exceeds 0.75 kg/m<sup>2</sup>/h.

(iii) Surface Moisture Evaporation Rate

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

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.

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:

- (a) 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.
- (b) by first applying a chemical retarder to the surface and then removing the mortar from between the larger aggregate particles with a water jet and brush.

The face of joints shall be cleaned of all laitance and dirt, after which a slurry 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.

#### E16.3.12 Application of Dampproofing

Surfaces shall be patched prior to application of dampproofing.

Brush or spray primer on all surfaces, brushing into all corners and allow to dry. Apply two (2) coats of dampproofing allowing the first coat to dry before applying the second coat. Minimum application rate per coat shall be 0.6 L per square metre.

The supply and application of dampproofing will be considered incidental to the supply and placement of structural concrete.

### E16.4 Quality Control

#### E16.4.1 Inspection

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 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.

#### E16.4.2 Access

The Contract Administrator shall be afforded full access for the inspection and control 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.

#### E16.4.3 Corrective Action

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.

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.

**E16.5 Method of Measurement**

**E16.5.1 Structural Concrete**

The supply and placement of structural concrete shall be measured on a volume basis. All volume to be paid for shall be the total number of cubic metres of structural concrete supplied and placed in accordance with this Specification and accepted by the Contract Administrator, as computed from Drawing dimensions. No deductions will be made for chamfers, reinforcing steel, structural steel, bolts, or voids of seventy-five (75) mm in diameter or less. All accessories like inserts are incidental to the supply and placement of structural concrete and no payment shall be made for this work.

**E16.6 Basis of Payment**

**E16.6.1 Structural Concrete**

The supply and placement of structural concrete will be paid for at the Contract Unit Price per cubic metre for the "Supply and Place Structural Concrete," measured as specified herein, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification.

**E17. REMOVAL OF WOOD FENCE**

**E17.1 Description**

**E17.1.1 General**

(a) This specification covers the removal and disposal of an existing wood fence adjacent to the Earl's Restaurant parking lot as part of Part E of the Work.

**E17.2 Materials and Equipment**

E17.2.1 Not applicable.

**E17.3 Construction Methods**

**E17.3.1 General**

- (a) Remove existing wood fence panels and posts completely in the location shown on the drawings.
- (b) Dispose of fence components offsite.
- (c) Restore ground by filling post holes with granular material and topsoil.

**E17.4 Measurement and Payment**

**E17.4.1 Removal of Wood Fence**

(a) Removal of Wood Fence will be measured on a unit basis and paid for at the Contract Unit Price per unit for "Removal of Wood Fence". The number to be paid for will be the total unit of fence removed and disposed of in accordance with this specification and accepted by the Contract Administrator.

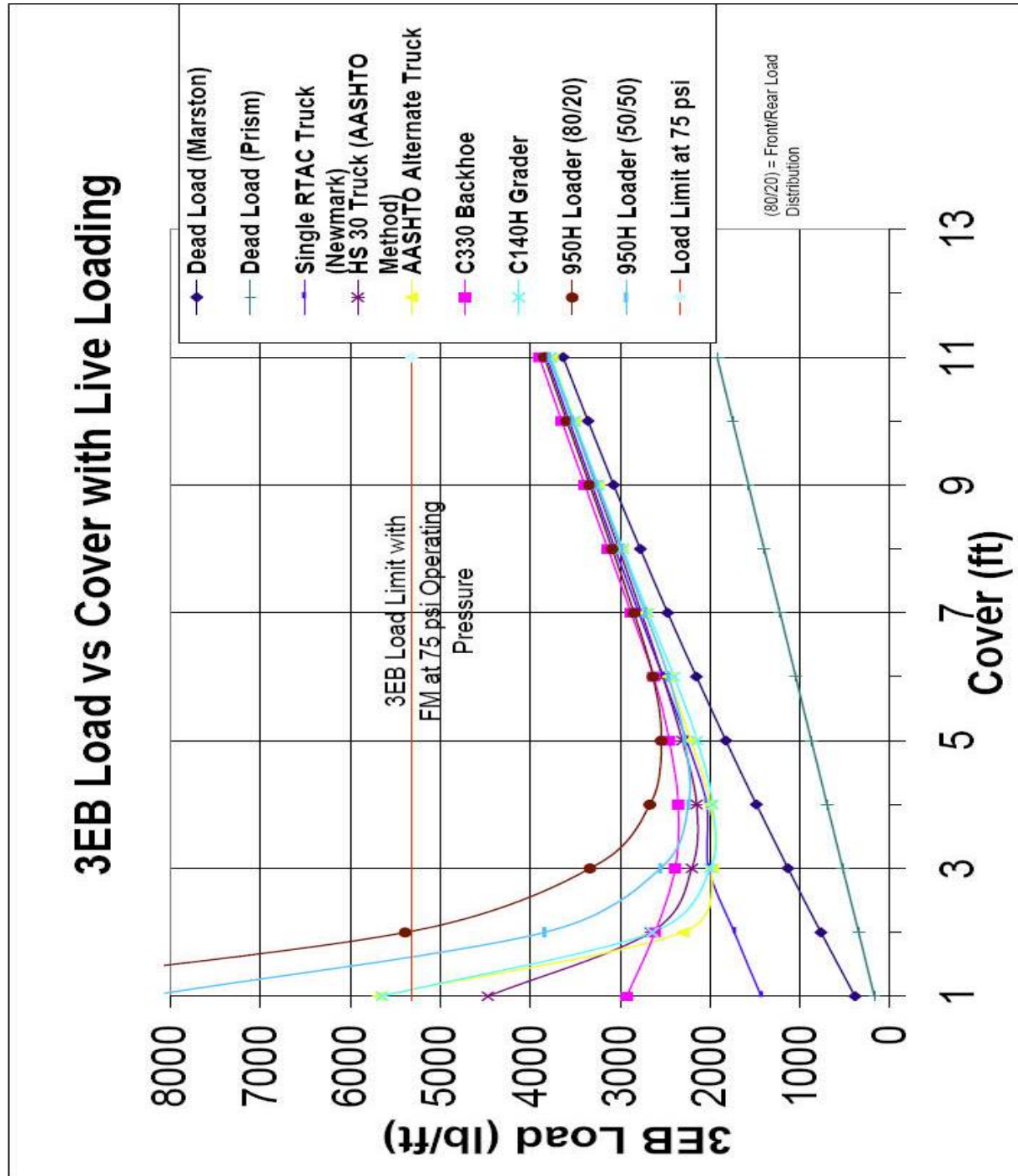
## **APPENDIX 'A'**

# **IMPACT OF TYPICAL CONSTRUCTION EQUIPMENT SURFACE LOADS ON THE FORT GARRY – ST. VITAL FEEDERMAIN**

Template Version: C420070405

## APPENDIX 'A' – IMPACT OF TYPICAL CONSTRUCTION EQUIPMENT SURFACE LOADS ON THE FORT GARRY – ST. VITAL FEEDERMAIN

The equipment load summary is provided to aid in the Contractor's evaluation of the impact of typical construction equipment on the feedermain at the Part B: Pembina Corridor – Pembina Hwy @ Bishop Grandin Blvd E/B Off Ramp site. The applied load limit at the surface is shown as a red line when the feedermain is at its operational pressure of 75 psi. The load from various typical construction equipment at various depths of cover over the feedermain is shown. The approximate depth of the feedermain at the Site is stated on the drawings.

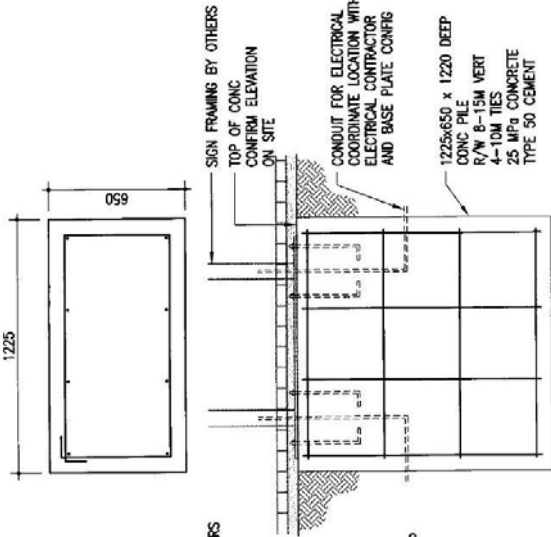


## **APPENDIX 'B'**

# **BUS STOP FLAG FOUNDATION DETAIL**



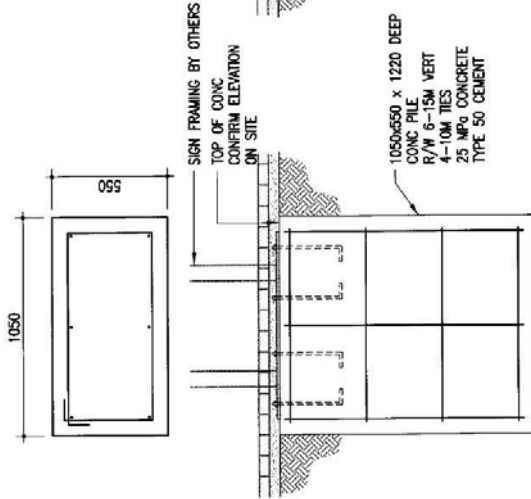
Template Version: C420070405



**BUS STOP TOTEM FOUNDATION**

1:20

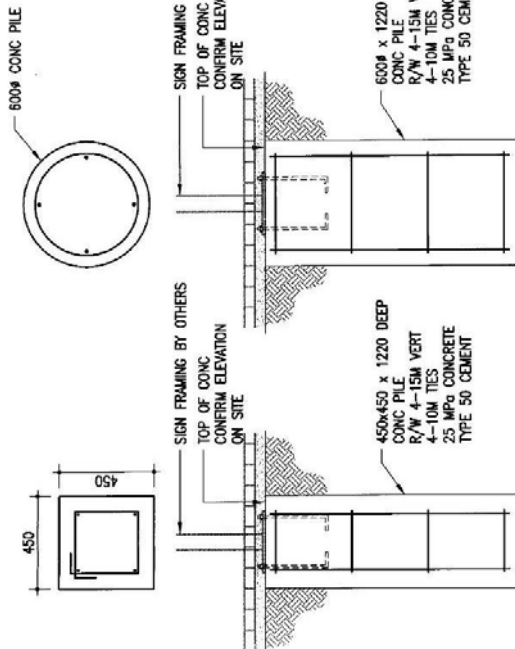
- ALL REINFORCING STEEL TO BE CSA G30.18 400 MPa NEW DEFORMED BARS
- CONCRETE COVER TO VERTICAL BARS SHALL BE 75.
- ANCHOR BOLTS TO BE PROVIDED BY OTHERS AND SET BY CONTRACTOR.



**TRANSIT INFORMATION  
POSTER KIOSK FOUNDATION**

1:20

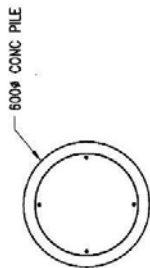
- ALL REINFORCING STEEL TO BE CSA G30.18 400 MPa NEW DEFORMED BARS
- CONCRETE COVER TO VERTICAL BARS SHALL BE 75.
- ANCHOR BOLTS TO BE PROVIDED BY OTHERS AND SET BY CONTRACTOR.



**BUS STOP FLAGS FOUNDATION**

1:20

- ALL REINFORCING STEEL TO BE CSA G30.18 400 MPa NEW DEFORMED BARS
- CONCRETE COVER TO VERTICAL BARS SHALL BE 75.
- ANCHOR BOLTS TO BE PROVIDED BY OTHERS AND SET BY CONTRACTOR.



OPTION B

Project	WINNIPEG TRANSIT SIGNS	MANITOBA
Sheet No.	FOUNDATIONS	S-1
Design	JUN	File
Drawn	JUN	Date
		MAY 10, 2007
		2007-0251

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**APPROVED**  
Certificate of Authorization  
Crosier Kilgour & Partners Ltd.  
No. 235 Date: MAY 15 2007

