



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 540-2009

BALMORAL TRANSIT TERMINAL

TABLE OF CONTENTS

PART A - BID SUBMISSION

Form A: Bid	1
Form B: Prices	4
Form G1: Bid Bond and Agreement to Bond	9
Form G2: Irrevocable Standby Letter of Credit and Undertaking	11

PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Site Investigation	1
B4. Enquiries	1
B5. Addenda	1
B6. Substitutes	2
B7. Bid Components	3
B8. Bid	4
B9. Prices	4
B10. Qualification	5
B11. Bid Security	5
B12. Opening of Bids and Release of Information	6
B13. Irrevocable Bid	6
B14. Withdrawal of Bids	7
B15. Evaluation of Bids	7
B16. Award of Contract	8

PART C - GENERAL CONDITIONS

C0. General Conditions	1
------------------------	---

PART D - SUPPLEMENTAL CONDITIONS

General

D1. General Conditions	1
D2. Scope of Work	1
D3. Definitions	1
D4. Contract Administrator	2
D5. Contractor's Supervisor	2
D6. Notices	2
D7. Furnishing of Documents	3

Submissions

D8. Authority to Carry on Business	3
D9. Safe Work Plan	3
D10. Insurance	3
D11. Performance Security	4
D12. Subcontractor List	4

Schedule of Work

D13. Commencement	4
D14. Restricted Work Hours	5
D15. Work By Others	5
D16. Substantial Performance	5
D17. Total Performance	5
D18. Liquidated Damages	5
D19. Scheduled Maintenance	6

Control of Work

D20. Job Meetings	6
D21. Prime Contractor – The Workplace Safety and Health Act (Manitoba)	6

Warranty

D22. Warranty	6
Form H1: Performance Bond	8
Form H2: Irrevocable Standby Letter of Credit	10
Form J: Subcontractor List	12

PART E - SPECIFICATIONS

General

E1. Applicable Specifications and Drawings	1
E2. Traffic Control	1
E3. Traffic Management	1
E4. Pedestrian Safety	2
E5. Water Used By Contractor	2
E6. Hazardous Materials	2
E7. Permits, Licences, Certificates, Laws, and Rules	2
E8. Damage to Existing Structures and Property	3
E9. TeraSpan	3
E10. Field Surveying and Engineering	4
E11. Removal of Miscellaneous Steel	4
E12. Removal, Salvage, and Re-Installation of Existing Chain Link Fence	5
E13. Removal of Remaining Unwanted Material	6
E14. Removal of Reinforced Concrete Pavement	6
E15. Cast-In-Place Concrete Foundations	7
E16. Sloped Curb	15
E17. Monolithic Barrier Curb and Sidewalk	15
E18. Hydro Excavation	16
E19. Detectable Warning Tile	16
E20. Unit Pavers	17
E21. Planter Preparation	19
E22. Illuminated Sign Structures and Sign Boxes	21
E23. Stainless Steel Cable Trellis	25
E24. Plant Material	25
E25. Extended Maintenance	28
E26. Painting of Terminal Ceiling	30
E27. Electrical Works	31

Appendix A: Existing Structure Drawings

PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 Balmoral Transit Terminal

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, August 18, 2009

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

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

B3. SITE INVESTIGATION

B3.1 Further to C3.1, the Contract Administrator or an authorized representative will be available at the Site from 11:00am to 1:00pm on August 13, 2009 to provide Bidders access to the Site. Bidders will be required to provide and wear their own safety vests. Bidders will meet with the Contract Administrator inside the Greyhound Terminal (indoors). The Bidders, with the Contract Administrator will check in with Greyhound's security prior to entering the outdoor portion of the Terminal. The Bidder is advised that the Site is currently a functioning Greyhound Bus Terminal. Bidders may review the Balmoral right-of-way at any time, but must not enter Greyhound's property except at the time indicated in B3.1.

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

B4. ENQUIRIES

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

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

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

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

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

B5. ADDENDA

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

- B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B5.2.2 The Bidder is responsible for ensuring that he has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B6. SUBSTITUTES

- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal in accordance with B6, or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

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

B7. BID COMPONENTS

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

B8. BID

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

B9. PRICES

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.
- B9.4 Prices from Non-Resident Bidders are subject to a Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B10. QUALIFICATION

B10.1 The Bidder shall:

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

B10.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

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

B10.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

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

B10.4 Further to B10.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

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

B10.5 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B10.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B11. BID SECURITY

B11.1 The Bidder shall provide bid security in the form of:

- (a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or
- (b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form

included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or

- (c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.

- B11.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.
- B11.1.2 All signatures on bid securities shall be original.
- B11.1.3 The Bidder shall sign the Bid Bond.
- B11.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.
- B11.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.
- B11.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B11.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.
- B11.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.
- B11.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

- B12.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.
 - B12.1.1 Bidders or their representatives may attend.
 - B12.1.2 Bids determined by the Manager of Materials, or his designate, to not include the bid security specified in B11 will not be read out.
- B12.2 Following the submission deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt>
- B12.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract Amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt>
- B12.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B13. IRREVOCABLE BID

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

B13.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid.

B14. WITHDRAWAL OF BIDS

B14.1 A Bidder may withdraw his Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B14.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

B14.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

B14.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

- (a) retain the Bid until after the Submission Deadline has elapsed;
- (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B14.1.3(b), declare the Bid withdrawn.

B14.2 A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed as provided for in B13.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law, including the right to retain the Bidder's bid security.

B15. EVALUATION OF BIDS

B15.1 Award of the Contract shall be based on the following bid evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation therefrom (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B6.

B15.2 Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B15.3 Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid or in other information required to be submitted, that he is responsible and qualified.

B15.4 Further to B15.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B15.4.1 If there is any discrepancy between the Total Bid Price written in figures, the Total Bid Price written in words and the sum of the quantities multiplied by the unit prices for each item, the sum of the quantities multiplied by the unit prices for each item shall take precedence.

B15.4.2 Further to B15.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B16. AWARD OF CONTRACT

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

B16.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B16.2.1 Without limiting the generality of B16.2, the City will have no obligation to award a Contract where:

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

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

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

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

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

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

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

(a) General

- (i) The existing Greyhound Canada bus terminal will be reconstructed to serve as a Winnipeg Transit terminal adjacent to the University of Manitoba. The terminal is located under the existing parkade. Four bus stops will be constructed under the parkade, along with additional stops on Balmoral Street. This project will augment the rehabilitation of the interior building (by others) to student services and other mixed commercial use.
- (ii) On Balmoral Street and within the proposed Balmoral Transit Terminal the removal and reconstruction of various areas of concrete roadway and concrete sidewalk as well as installation of Winnipeg Transit Amenities and their respective foundations, and lighting and electrical services.

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

- (a) Excavation of concrete roadway, boulevard, approach, and sidewalks;
- (b) Removal of miscellaneous steel and existing Site features such as bollards and chain link fencing;
- (c) Adjustment of pavement appurtenances;
- (d) Installation of catchbasins and connection pipes;
- (e) Full depth concrete lane construction on Balmoral Street;
- (f) Construction of concrete curbs, sidewalks, bullnoses;
- (g) Installation of decorative paving stones;
- (h) Planing and replacement of existing asphalt overlay on Balmoral Street;
- (i) Construction of concrete foundations for bus stop flags and information kiosks;
- (j) Construction of concrete planters;
- (k) Installation of metal bases for bus stop flags and information kiosks;
- (l) Supply and installation of aluminium structure for illuminated signs;
- (m) Supply and installation of illuminated sign;
- (n) Planter preparation;
- (o) Supply and installation of plant material;
- (p) Removal of existing terminal lighting and associated electrical appurtenances;
- (q) Electrical supply including panel and wiring to shelters, signage and lighting;
- (r) Supply and installation of lighting fixtures.

D3. DEFINITIONS

D3.1 When used in this Bid Opportunity:

- (a) "**Site**" means Balmoral Transit Terminal;

- (b) "**City**" means The City of Winnipeg;
- (c) "**Transit**" means Winnipeg Transit.

D4. CONTRACT ADMINISTRATOR

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

Mark Doucet, P.Eng.
Project Engineer
Suite 200 – 895 Waverley Street, Winnipeg, Manitoba, R3T 5P4
Telephone No. (204) 453 2301
Facsimile No. (204) 452 4412

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

D5. CONTRACTOR'S SUPERVISOR

D5.1 At the pre-construction meeting, the Contractor shall identify his designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D5.2 At least two (2) business days prior to the commencement of any Work on the Site, the Contractor shall provide the Contract Administrator with a phone number where the supervisor identified in D5.1 or an alternate can be contacted twenty-four (24) hours a day to respond to an emergency.

D6. NOTICES

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

D6.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D6.3, D6.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the address or facsimile number identified in D4.1.

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

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

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

The City of Winnipeg
Internal Services Department
Legal Services Division
Attn: City Solicitor

185 King Street, 3rd Floor
Winnipeg MB R3B 1J1
Facsimile No.: (204) 947-9155

D7. FURNISHING OF DOCUMENTS

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

SUBMISSIONS

D8. AUTHORITY TO CARRY ON BUSINESS

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

D9. SAFE WORK PLAN

- D9.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D9.2 The Safe Work Plan shall be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/safety/default.stm>

D10. INSURANCE

- D10.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability, broad form property damage cover and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
 - (b) 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;
 - (d) all risks course of construction insurance in the amount of one hundred percent (100%) of the total Contract Price, written in the name of the Contractor and The City of Winnipeg, at all times during the performance of the Work and until the date of Total Performance.
- D10.2 Deductibles shall be borne by the Contractor.
- D10.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in the C4.1 for the return of the executed Contract.

D10.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D11. PERFORMANCE SECURITY

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

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

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

D11.2 If the bid security provided in his Bid was not a certified cheque or draft pursuant to B11.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site and in no event later than the date specified in the C4.1 for the return of the executed Contract.

D12. SUBCONTRACTOR LIST

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

SCHEDULE OF WORK

D13. COMMENCEMENT

D13.1 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.

D13.2 The Contractor shall not commence any Work on the Site until:

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

- (c) Greyhound Canada has moved out of the Terminal. This is scheduled to be complete by September 1, 2009.

D13.3 The Contractor shall not commence the Work on the Site before September 1, 2009 and no later than September 14, 2009, as directed by the Contract Administrator and weather permitting.

D13.4 The City intends to award this contract by August 26, 2009.

D14. RESTRICTED WORK HOURS

D14.1 Further to clause 3.10 of CW 1130, the Contractor shall require written permission forty-eight (48) hours in advance from the Contract Administrator for any Work to be performed between 2000 hours and 0700 hours, or on Saturdays, Sundays, Statutory Holidays and or Civic Holidays.

D15. WORK BY OTHERS

D15.1 Work by others on or near the Site will include but not necessarily be limited to:

- (a) Relocation of hydro poles;
- (b) Re-construction of interior of building;
- (c) Removal of overhead doors joining the interior and exterior spaces;
- (d) Relocation of doors joining the interior and exterior spaces;
- (e) Removal of observation room at the north end of the Site.

D16. SUBSTANTIAL PERFORMANCE

D16.1 The Contractor shall achieve Substantial Performance by November 6, 2009.

D16.2 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.

D16.3 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.

D17. TOTAL PERFORMANCE

D17.1 The Contractor shall achieve Total Performance by June 1, 2010.

D17.2 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.

D17.3 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.

D18. LIQUIDATED DAMAGES

D18.1 If the Contractor fails to achieve Substantial Performance in accordance with the Contract by the day fixed herein for Total Performance, the Contractor shall pay the City two-thousand

dollars (\$2000) per Calendar Day for each and every Calendar Day following the day fixed herein for Total Performance during which such failure continues.

- D18.2 The amount specified for liquidated damages in D18.1 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.
- D18.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D19. SCHEDULED MAINTENANCE

- D19.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:
- (a) Reflective Crack Maintenance (during one year warranty period) as specified in CW 3250;
 - (b) Anti-Graffiti Coating maintenance, as specified in E15.3.17
 - (c) Extended Maintenance as specified in E25;
- D19.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

CONTROL OF WORK

D20. JOB MEETINGS

- D20.1 Regular weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City, and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City, and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.
- D20.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D21. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

- D21.1 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

D22. WARRANTY

- D22.1 Notwithstanding C13.2, the warranty period shall begin on the date of Substantial Performance and shall expire two (2) years thereafter unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.

- D22.2 Notwithstanding C13.2 or D22.1, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Substantial Performance if:
- (a) a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.
- D22.2.1 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.
- D22.3 Notwithstanding D22.1, the Extended Maintenance of Trees and Vines in E25 shall be independent of the warranty period.

FORM H1: PERFORMANCE BOND
(See D11)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$_____)

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

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

BID OPPORTUNITY NO. 540-2009

Balmoral Transit Terminal

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

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

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

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

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

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

_____ day of _____, 20____.

SIGNED AND SEALED
in the presence of:

(Witness as to Principal if no seal)

(Name of Principal)

Per: _____ (Seal)

Per: _____

(Name of Surety)

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

**FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)**
(See D11)

(Date)

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

RE: PERFORMANCE SECURITY – BID OPPORTUNITY NO. 540-2009

Balmoral Transit Terminal

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 J: SUBCONTRACTOR LIST
(See D12)

Balmoral Transit Terminal

<u>Portion of the Work</u>	<u>Name</u>	<u>Address</u>
SUPPLY OF MATERIALS		
Concrete		
Asphalt		
Base Course & Sub-Base		
Catchbasins/Drainage Pipe		
Paving Stones		
Painting		
Planter Preparation		
Plant Material		
Illuminated Rapid Transit Sign		
Sign Structure for Illuminated Sign		
Electrical Installation		
INSTALLATION/CONSTRUCTION		
Concrete		
Asphalt		
Base Course & Sub-Base		
Catchbasins/Drainage Pipe		
Paving Stones		
Painting		
Planter Preparation		
Plant Material		
Illuminated Rapid Tranist Sign		
Sign Structure for Illuminated Sign		
Electrical Installation		

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

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

<u>Drawing No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
P-3313-01	Cover Sheet	A1
P-3313-02	Removals	A1
P-3313-03	Construction Plan	A1
P-3313-04	Sections and Details-1	A1
P-3313-05	Sections and Details-2	A1
P-3313-06	Unit Paver Patterns	A1
P-3313-07	Landscape Layout & Planting Plan	A1
P-3313-08	Signage and Planting Details	A1
P-3313-09	Electrical Schedules & Demolition	A1
P-3313-10	Electrical Layout	A1

E2. TRAFFIC CONTROL

- E2.1 Further to clauses 3.6 and 3.7 of CW 1130-R1:
- (a) Where directed, the Contractor shall construct and maintain temporary asphalt ramps to alleviate vertical pavement obstructions such as manholes and planing drop-offs to the satisfaction of the Contract Administrator. Payment shall be in accordance with CW3410.
- (b) In accordance with the Manual of Temporary Traffic Control in Work Areas on City Streets, the Contractor ("Agency" in the manual) shall make arrangements with the Traffic Services Branch of the City of Winnipeg to place all temporary regulatory signs. The Contractor shall bear all costs associated with the placement of temporary traffic control devices by the Traffic Services Branch of the City of Winnipeg in connection with the Works undertaken by the Contractor.

E3. TRAFFIC MANAGEMENT

- E3.1 Further to clause 3.7 of CW 1130-R1:
- E3.1.1 Construction on Balmoral Street shall be done in two phases:
- (a) Phase 1: Construct east gutter lane. The Contractor may close the lane adjacent to the lane under construction to facilitate equipment staging and loading. The west gutter lane must remain open at all times, with a minimum width of 3.4 m. Parking and loading will not be permitted in the west lane during this phase.

- (b) Phase 2: Construct mid-block pedestrian crossing, curb and west sidewalk pavement. Contractor must maintain two lanes of traffic on Balmoral Street during this phase, with a minimum lane width of 3.4 m.

- E3.1.2 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.
- E3.1.3 East/West traffic on Portage Ave at Balmoral Street must not be disrupted by construction or construction related vehicles. This includes, but is not limited to the parking or queuing of construction related vehicles on Portage Ave.
- E3.1.4 Intersecting street and private approach access shall be maintained at all times.
- E3.1.5 Further to E3.1.4, private approach access into the terminal does not have to be maintained at all times, except for the Contractor's purposes.
- E3.1.6 Should the Contractor be unable to maintain pedestrian or vehicular access to a residence or business, he shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 24 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.
- E3.1.7 Pedestrian and ambulance/emergency vehicle access must be maintained at all times.
- E3.1.8 Existing Bus Stops to be temporarily moved north of the construction site on Balmoral Street (by others).
- E3.1.9 During the hours when the Contractor is not working, equipment and stockpiled materials shall be left on private property within the project Site, in such a location so as not to interfere with or present a hazard to motorists or pedestrians.

E4. PEDESTRIAN SAFETY

- E4.1 During the project a temporary snow fence shall be installed 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.
- E4.2 The east sidewalk on Balmoral shall be closed. Sidewalk closed signage shall be placed at the nearest public crosswalks at Ellice Ave. and Portage Ave.
- E4.3 During the project pedestrians shall be safely directed to the sidewalk on the west side of Balmoral Street. The west sidewalk shall remain safely open at all times.

E5. WATER USED BY CONTRACTOR

- E5.1 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.

E6. HAZARDOUS MATERIALS

- E6.1 If asbestos or other hazardous materials are encountered during the Work of the Contract, the Contractor shall stop all Work and notify the Contract Administrator immediately. Removal of hazardous materials shall be dealt with by the City and the Contractor shall await further instruction by the Contract Administrator.

E7. PERMITS, LICENCES, CERTIFICATES, LAWS, AND RULES

- E7.1 The Contractor shall give all necessary notices, obtain all necessary permits and pay all fees in order that the Work may be carried out. The Contractor shall submit all plans required by any

inspection authority and obtain approval of same before proceeding with the Work and pay any cost attached to the inspection of such plans.

E7.2 The Contractor shall comply with all laws, ordinances, rules, and regulations that would relate to the Work.

E7.3 The Contractor and Subcontractors must be fully aware of all Work involving hazardous materials. All Work must be performed in compliance to the Manitoba Department of Labour Workplace Health and Safety Guidelines and all other applicable codes. The Contractor is responsible for the immediate notification to the Contract Administrator of his/her encountering of suspected hazardous material during their course of Work.

E8. DAMAGE TO EXISTING STRUCTURES AND PROPERTY

E8.1 All necessary precautions shall be exercised by the Contractor so as not to remove, disturb, or damage any existing water pipes, gas pipes, electrical wires, cables, conduits, sewers, or other existing facilities and equipment at the Site of the Work. For all damage incurred thereto in the performance of the Work, the Contractor shall, upon instructions from and to the satisfaction of the Contract Administrator, either replace and repair such damage, whichever may be deemed necessary in the opinion of, and acceptable to, the Contract Administrator and the cost of which shall be borne entirely by the Contractor.

E8.2 The Contractor shall also indemnify and save harmless the City and the Contract Administrator from all claims made directly against it in respect to any such damage.

E8.3 Any damage caused by the negligence of the Contractor or his Subcontractors to the adjacent Works or properties, shall be promptly repaired by him at his own expense, to the satisfaction of the Contract Administrator.

E9. TERASPAN

E9.1 Description

E9.1.1 There is a TeraSpan emergency services communication cable currently installed in the sidewalk within the Balmoral right-of-way. The cable also runs through the pavement of the terminal into the the 491 Portage building. The cable must be extricated from the existing sidewalk and buried in the underlying sub-grade prior to placement of new base course and sidewalk/pavement.

E9.1.2 The cable cannot be taken out of service and shall not be damaged.

E9.1.3 TeraSpan representative shall be on site during to concrete removal. Contractor shall notify TeraSpan two (2) weeks prior to concrete removal.

E9.1.4 Contact information:
TeraSpan
Darryl Stotski
Tel: 204-783-2050
Cell: 204-999-3657

E9.2 Materials

(a) Not applicable.

E9.3 Construction Methods

(a) Sawcut the existing sidewalk/pavement 150mm on either side of the cable. Break and remove concrete outside of the sawcuts as per CW 3110.

(b) Concrete in between the sawcuts shall be hand removed, ensuring no damage occurs to the cable.

- (c) Construct 100 mm wide by 100 mm deep trench in existing subgrade. Construct trench along same alignment as original install.
- (d) Place 50 mm of base course material in the trench. Install cable including tracer wire. Maintain a consistent offset from the building columns for future reference.
- (e) Cover remainder of trench with base course material and tamp with hand tools. Do not mechanically compact.
- (f) If any cable is exposed overnight or when contractor is not onsite, the area shall be barricaded.
- (g) Contractor to protect newly buried cable until sidewalk and pavement is restored.

E9.4 Measurement and Payment

- (a) No measurement or payment will be made for this item. The Work associated with this item will be incidental to concrete pavement removal.

E10. FIELD SURVEYING AND ENGINEERING

E10.1 General

E10.1.1 The Contract Administrator will provide reference base lines and reference elevations for the Work. The Contractor is responsible to maintain the reference base lines, elevations, and layout information and provide surveying materials.

E10.2 Responsibilities of Contract Administrator

E10.2.1 The Contract Administrator will be responsible for:

- (a) Establishing at least three temporary benchmarks on the project Site.
- (b) Establishing control points as necessary including critical radii and stations.
- (c) Providing layout points for back of curb, radii, curb ramps, paving stone fields, and other Site appurtenances
- (d) All vertical grading
- (e) Surveying and measurement for all payment quantities.
- (f) Verification of construction to lines and grades indicated on the design drawings.

E10.3 Responsibilities of Contractor

E10.3.1 The Contractor will be responsible for:

- (a) Protection and maintaining all surveying control points, layout points, benchmarks, and grading.
- (b) Resetting damaged or missing stakes to lines and grades indicated on plans or by Contract Administrator.
- (c) Constructing the Site to the lines and grades indicated by the Contract Administrator
- (d) Provide the Contract Administrator with stakes, lathe, ribbon, and paint for use in setting baselines and control points.

E11. REMOVAL OF MISCELLANEOUS STEEL

E11.1 Description

E11.1.1 General

- (b) This specification shall cover the removal of all existing steel guardrails, steel bollards and steel handrails.

E11.2 Materials and Equipment

E11.2.1 Not specified

E11.3 Construction Methods

E11.3.1 Removal of Miscellaneous Steel

- (a) Removal of all objects designated for removal on the plans or by the Contract Administrator, including any concrete bases, visible or not.
- (b) Remove concrete rubble greater than 50 mm in thickness attached to steel bollard bases.
- (c) All bus bay steel bollards shall be salvaged and placed under the parkade ramp adjacent to the east parking lot within the lockable chain link fence area. See Appendix 'A' for bollard installation details.
- (d) All other debris is to be removed from the Site and disposed of or salvaged by the Contractor.

E11.4 Measurement and Payment

(a) Removal of Miscellaneous Steel

- (i) The removal of the steel guardrails, steel bollards and steel handrails shall be measured on a lump sum and paid for at the Contractor Unit Price for "Removal of Miscellaneous Steel". The amount to be paid for shall be for the removal of all miscellaneous steel in accordance with this specification, accepted and measured by the Contract Administrator.

E12. REMOVAL, SALVAGE, AND RE-INSTALLATION OF EXISTING CHAIN LINK FENCE

E12.1 Description

E12.1.1 General

- (a) This specification shall cover the removal of all existing chain link fence.
- (b) This specification will also cover salvaging and installing 1.83m high fence located along the Balmoral sidewalk and re-installing along the most northern part of the Site as identified on the drawings and by the Contract Administrator.
- (c) Referenced Standard Construction Specifications
 - (i) CW 3550 – Chain Link Fencing.

E12.2 Materials

E12.2.1 General

- (a) All new materials as per CW 3550. Salvaged fence materials as existing on Site.

E12.3 Construction Methods

E12.3.1 General

- (a) Construction as per Contract Drawings and as per CW 3550.

E12.3.2 Removal of Fence

- (a) Remove all fencing materials as shown on the drawings and designated by the Contract Administrator for removal, including any concrete bases, visible or not.

E12.3.3 Salvage Fence

- (a) Remove and temporarily store fencing for future reinstallation or stockpiling.
- (b) Salvage useable posts, fabric, turnbuckles, braces, and midrails.
- (c) Excess fencing not required for reinstallation shall be the property of the Contractor.

E12.3.4 Reinstall Fence

- (a) Reinstall fencing utilizing salvaged materials. Utilize new hardware as required to affix fencing to new concrete sidewalk and underside of parkade beam.

E12.4 Measurement and Payment

E12.4.1 Removal of Chain Link Fence

- (a) The Removal of the existing chain link fence will be measured on a lineal metre basis and paid for at the Contract Unit Price for "Removal of Chain Link Fence". The amount to be paid for shall be the total number of lineal metres of chain link fence removed in accordance with this specification, accepted and measured by the Contract Administrator.

E12.4.2 Removal and Reinstallation of Chain Link Fence

- (a) Removal and reinstallation of the existing chain link fence will be measured on a lineal metre basis and paid for at the Contract Unit Price for "Removal and Reinstallation of Chain Link Fence". The amount to be paid for shall be the total number of lineal metres of chain link fence reinstalled in accordance with this specification, accepted and measured by the Contract Administrator.

E13. REMOVAL OF REMAINING UNWANTED MATERIAL

E13.1 Description

E13.1.1 General

- (a) This specification shall cover the removal of the existing unwanted material by the previous tenant (Greyhound Canada) as identified by the Contract Administrator. Such items may include but not limited to scaffolding, waste receptacles, drums, signage, and/or wood pallets.

E13.2 Construction Methods

- (a) Remove all objects designated by the Contract Administrator for removal.
- (b) All debris is to be removed from the Site and disposed of or salvaged by the Contractor.

E13.3 Measurement and Payment

- (a) The Removal of the existing unwanted material will be measured on a lump sum basis and paid for at the Contract Unit Price for "Removal of Unwanted Material" in accordance with this specification, accepted and measured by the Contract Administrator.

E14. REMOVAL OF REINFORCED CONCRETE PAVEMENT

E14.1 Description

E14.1.1 General

- (a) This specification shall cover the removal of the existing reinforced concrete sidewalk as identified on the drawings and by the Contract Administrator.

E14.2 Materials

- (a) Not applicable.

E14.3 Construction Methods

- (a) Remove existing reinforced concrete sidewalk and reinforced concrete pavement under the terminal as per Clause 3.1 of CW 3110.
- (b) Remove all other sidewalk and concrete pavement as per Clause 3.1 of CW 3110.
- (c) See Appendix "A" for drawing of existing reinforced concrete sidewalk

E14.4 Measurement and Payment

- (a) The removal of the existing reinforced and non-reinforced concrete sidewalk and pavement will be measured on an area basis and paid for at the Contract Unit Price for "Removal of Reinforced Concrete Pavement". The area to be paid for shall be the total number of square metres removed in accordance with this Specification and as measured and accepted by the Contract Administrator.

E15. CAST-IN-PLACE CONCRETE FOUNDATIONS

E15.1 Description

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

E15.2 Materials

E15.2.1 General

- (a) 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

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

E15.2.3 Testing and Approval

- (a) All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator or by the Testing Laboratory designated by the Contract Administrator. There shall be no charge to the City for any materials taken by the Contract Administrator for testing purposes.
- (b) All materials shall be approved by the Contract Administrator at least seven (7) days before any construction is undertaken. If, in the opinion of the Contract Administrator, such materials in whole or in part, do not conform to the Specifications detailed herein or are found to be defective in manufacture or have become damaged in transit, storage, or handling operations, then such materials shall be rejected by the Contract Administrator and replaced by the Contractor at his own expense.

E15.2.4 Patching Mortar

- (a) The patching mortar shall be made of the same cementitious material and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than 1 part cement to 2 parts sand by damp loose volume. White Portland Cement shall be substituted for a part of the grey Portland Cement on exposed concrete in order to produce a colour matching the colour of the surrounding concrete, as determined by a trial patch. The quantity of mixing water shall be no more than necessary for handling and placing.

E15.2.5 Cement

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

E15.2.6 Concrete

- (a) General

- (i) Concrete repair material shall be compatible with the concrete substrate.
- (b) The Contractor shall be responsible for the design and performance of all concrete mixes supplied under this specification. Either ready mix concrete or proprietary repair mortars, where applicable, may be used having the following minimum properties in accordance with CSA A23.1-04:
 - (i) Class of Exposure: S-1
 - (ii) Compressive Strength @ 56 days = 35 MPa
 - (iii) Water / Cementing Materials Ratio = 0.4
 - (iv) Air Content: Category 2 per Table 4 of CSA A23.1-04 (4-7%)
 - (v) Cement – shall be as specified in E15.2.5
- (c) Mix design for ready mix concrete shall be submitted to Contract Administrator at least two weeks prior to concrete placing operations.
- (d) The workability of each concrete mix shall be consistent with the Contractor's placement operations. Self compacting concrete may be used for the foundations.
- (e) Any proposed proprietary repair mortar shall be subject to the approval of the Contract Administrator and must meet or exceed the properties of the ready mix concrete.
- (f) The temperature of all types of concrete shall be between 15°C and 25°C at discharge. Temperature requirements for concrete containing silica fume shall be between 10°C and 18°C at discharge unless otherwise approved by the Contract Administrator.
- (g) Concrete materials susceptible to frost damage shall be protected from freezing.

E15.2.7

Aggregate

- (a) The Contractor shall be responsible for testing the fine and coarse aggregates to establish conformance to these specifications, and the results of these tests shall be provided to the Contract Administrator if requested. All aggregates shall comply with CSA A23.1.
- (b) Coarse Aggregate
 - (i) The maximum nominal size of coarse aggregate shall be sized to suit the Contractor's mix design. Gradation shall be in accordance with CSA A23.1, Table 11, Group 1. The coarse aggregate shall satisfy the Standard Requirements specified in CSA A23.1, Table 12, "Concrete Exposed to Freezing and Thawing".
 - (ii) Coarse aggregate shall consist of crushed stone or gravel or a combination thereof, having hard, strong, durable particles free from elongation, dust, shale, earth, vegetable matter or other injurious substances. Coarse aggregate shall be clean and free from alkali, organic or other deleterious matter; and shall have an absorption not exceeding 2.25%.
 - (iii) The aggregate retained on the 5 mm sieve shall consist of clean, hard, tough, durable, angular particles with a rough surface texture, and shall be free from organic material, adherent coatings of clay, clay balls, and excess of thin particles or any other extraneous material.
 - (iv) Coarse aggregate when tested for abrasion in accordance with ASTM C131 shall not have a loss greater than 30%.
 - (v) Tests of the coarse aggregate shall not exceed the limits for standard for requirements prescribed in CSA A23.1, Table 12, for concrete exposed to freezing and thawing.
- (c) Fine Aggregate
 - (i) Fine aggregate shall meet the grading requirements of CSA A23.1, Table 10, Gradation FA1.
 - (ii) Fine aggregate shall consist of sand, stone, screenings, other inert materials with similar characteristics or a combination thereof, having clean, hard, strong,

- durable, uncoated grains free from injurious amounts of dust, lumps, shale, alkali, organic matter, loam, or other deleterious substances.
- (iii) Tests of the fine aggregate shall not exceed the limits for standard requirements prescribed in CSA A23.1, Table 12.

E15.2.8 Cementing Materials

- (a) Cementing materials shall conform to the requirements of CSA A3001.
- (b) Silica Fume
- (i) Should the Contractor choose to include silica fume in the concrete mix design, it shall not exceed 8% by mass of cement.
- (c) Fly Ash
- (i) Fly ash shall be Type C1 or Type F and shall not exceed 25% by mass of cement.
- (d) Cementitious materials shall be stored in a suitable weather-tight building that shall protect these materials from dampness and other destructive agents. Cementitious materials that have been stored for a length of time resulting in the hardening or formation of lumps shall not be used in the Work.

E15.2.9 Admixtures

- (a) Air entraining admixtures shall conform to the requirements of ASTM C260.
- (b) Chemical admixtures shall conform to the requirements of ASTM C494 or C1017 for flowing concrete.
- (c) All admixtures shall be compatible with all other constituents. The addition of calcium chloride, accelerators, and air-reducing agents will not be permitted, unless otherwise approved by the Contract Administrator.
- (d) Appropriate low range water reducing and/or superplasticizing admixtures shall be used in concrete containing silica fume. Approved retarders or set controlling admixtures may be used for concrete containing silica fume.
- (e) An aminocarboxylate based migrating corrosion inhibitor admixture shall be used in concrete that will be used as a repair material that will either be in contact with or adjacent to reinforcing steel in existing concrete. Proposed admixtures shall be subject to the approval of the Contract Administrator.

E15.2.10 Water

- (a) Water used for mixing concrete shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances. It shall be equal to potable water in physical and chemical properties.

E15.2.11 Concrete Supply

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

E15.2.12 Reinforcing Steel

- (a) Reinforcing steel shall be deemed to include all reinforcing bars, tie-bars, and dowels.
- (b) All reinforcing steel shall conform to the requirements of CSA Standard G30.18, Grade 400 W, Billet-Steel Bars for Concrete Reinforcement. All reinforcing steel shall be new deformed billet steel bars. All bars, including ties, shall be hot-dip galvanized

in accordance with CSA Standard G164 for a minimum net retention of 600 g/m². Reinforcing steel supply and installation will be incidental to construction of concrete foundation and no separate payment will be made.

E15.2.13 Anchor Bolts, Nuts, and Washers

- (a) Anchor bolts, nuts, and washers shall be supplied by the Contract Administrator.
- (b) Anchor bolt supply and installation will be incidental to construction of concrete foundation and no separate payment will be made.

E15.2.14 Anchor Bolt Templates

- (a) Anchor bolt templates shall be supplied by the Contract Administrator.
- (b) Anchor bolt templates will be incidental to construction of new concrete foundation and no separate payment will be made.

E15.2.15 Fibre Joint Filler

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

E15.2.16 Anti-Graffiti Coating

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

E15.2.17 Waterproofing Membrane

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

E15.2.18 Miscellaneous Materials

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

E15.3 Construction Methods

E15.3.1 Location and Alignment of Foundations

- (a) Foundation construction shall not commence until the Contractor has obtained clearance from the appropriate Utility Authorities.
- (b) Foundations shall be placed in the positions shown on the Drawings and as directed by the Contract Administrator in the field.
- (c) The deviation of the axis of any finished foundation shall not differ by more than 1 percent from the vertical.

E15.3.2 Buried Utilities

- (a) The Contractor shall exercise extreme caution when constructing the foundations in the vicinity of existing buried utilities and buildings. The Drawings show the approximate locations of existing buried utilities. The Contractor shall be responsible for obtaining the exact location of the buried utilities from the appropriate Utility Authorities prior to installing the foundations.
- (b) The proposed locations of the foundations may be changed by the Contract Administrator if they interfere with the buried utilities.
- (c) The Contractor shall be responsible for all costs that may be incurred for repair/rectification of any damage caused to the existing buried utilities as a result of the Contractor's operations in constructing cast-in-place concrete foundations, as determined by the Contract Administrator.

E15.3.3 Excavation

- (a) The Contractor is responsible for determining the excavation method at each foundation location.
- (b) Excavations for foundations shall be made with equipment designed to remove a core of the diameter shown on the Drawings, or hydro-jet excavation to a depth to bypass and/or expose adjacent utilities.
- (c) Upon reaching the required elevation, the bottom of the excavation shall be cleaned as directed by the Contract Administrator in the field.
- (d) All excavated material from the foundations shall be promptly hauled away from the Site to an approved disposal area as located by the Contractor.
- (e) Upon completion of the cleaning out of the bottom to the satisfaction of the Contract Administrator, the reinforcement and anchor bolts shall be set in place and the concrete poured immediately. Under no circumstances shall a hole be left to stand open after boring has been completed.

E15.3.4 Sleeving

- (a) Timber or steel sleeving shall be used to temporarily line the bore to prevent bulging or caving of the walls and to protect men at work in the bore.
- (b) The sleeving shall be designed by the Contractor and constructed to resist all forces that may tend to distort it.
- (c) The sleeving shall be withdrawn as the concrete is placed in the bore. The sleeving shall extend at least 1 m below the top of the freshly deposited concrete at all times.
- (d) The clearance between the face of the bore hole and the sleeving shall not exceed 75 mm.

E15.3.5 Inspection of Bores

- (a) Concrete shall not be placed in a bore until the bore has been inspected and approved by the Contract Administrator.
- (b) The Contractor shall have available suitable light for the inspection of each bore throughout its entire length.
- (c) All improperly set sleeving, bore, or bottom shall be corrected to the satisfaction of the Contract Administrator.

E15.3.6 Placing Reinforcing Steel

- (a) Reinforcement shall be:
 - (i) placed in accordance with the details shown on the Drawings
 - (ii) rigidly fastened together, and
 - (iii) lowered into the bore intact before concrete is placed.
- (b) Spacers shall be utilized to properly locate the reinforcing steel cage in the bore.

E15.3.7 Placing Anchor Bolts

- (a) The anchor bolts shall be aligned with a steel template supplied by the Contract Administrator matching the bolt holes in the sign structure base plate. **Extreme care shall be used in this operation to ensure bolts are aligned properly.** Placement of anchor bolts without the steel template will not be permitted.
- (b) The threaded portion of the anchor bolts projecting above the top surface of foundation shall be coated with oil, before the concrete is poured, to minimize the fouling of threads splattered by concrete residue.

E15.3.8 Placing Metal Bases

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

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

E15.3.9 Forms

- (a) Forms for exposed surfaces that require an "ordinary surface finish" shall be made of good quality plywood, or an approved equivalent, or uniform thickness, with or without a form liner.
- (b) Architectural concrete form liner shall be as specified on the Plans or equivalent as approved by the Engineer.
- (c) Permeable formwork liner shall be Drainoform, Zemdrail II, or equivalent as approved by the Engineer.
- (d) Formwork materials shall conform to CSA Standard CAN/CSA-A23.1, and American Concrete Publication SP:4, "Formwork for Concrete".
- (e) No "stay-in-place" formwork or falsework is permitted.
- (f) Form sheeting plywood to be covered with form liner or to be directly in contact with soil shall be exterior Douglas Fir, concrete form grade, conforming to CSA Standard O121-M1978, a minimum of 20 mm thick.
- (g) Where form liner is not being used, form sheeting shall be Douglas Fir, overlay form liner type conforming to CSA Standard O121-M1978. Approved manufacturers are "Evans" and "C-Z".
- (h) Boards used for formwork shall be fully seasoned and free from defects such as knots, warps, cracks, etc., which may mark the concrete surface.
- (i) No formwork accessories will be allowed to be left in place within 50 mm of the surface following form removal. Items to be left in place, must be made from a non-rusting material or galvanized steel; and they shall not stain, blemish, or spall the concrete surface for the life of the concrete.
- (j) Forms for exposed concrete surfaces that do not require a form liner may be either new plywood or steel as authorized by the Contract Administrator.
- (k) Studding shall be spruce or pine and shall have such dimensions and spacing that they shall withstand distortion from all the forces to which the forms will be subjected. Minimum dimensions shall be 50 mm x 150 mm.
- (l) Walers shall be spruce or pine, with minimum dimensions of 100 mm x 150 mm.
- (m) All forms are incidental to these Works and must be removed by the Contractor once adequate strength and curing of the concrete has been achieved.
- (n) The forms shall be sufficiently rigid to prevent lateral or vertical distortions from the loading environment to which they shall be subjected. Forms shall be set to the design grades, lines, and dimensions, as shown on the Drawings.

E15.3.10 Placing Concrete

- (a) Care shall be taken to ensure that anchor bolts are vertically aligned and that anchor bolts and conduits are properly positioned prior to placement of concrete.
- (b) Concrete shall not have a free fall of more than 2.0 m and shall be placed so that the aggregates will not separate or segregate. The slump of the concrete shall not exceed 110 mm. The concrete shall be vibrated throughout the entire length of the foundation.
- (c) Concrete shall be placed to the elevations as shown on the Drawings. The top surface of the foundation shall be finished smooth and even with a hand float.
- (d) The shaft shall be free of water prior to placing of concrete. Concrete shall not be placed in or through water unless authorized by the Contract Administrator.

E15.3.11 Protection of Newly Placed Concrete

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

E15.3.12 Construction Joints

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

E15.3.13 Curing Concrete

- (a) The top of the freshly finished concrete foundations shall be covered and kept moist by means of wet polyester blankets immediately following finishing operations and shall be maintained at above 10°C for at least seven (7) consecutive days thereafter.
- (b) After the finishing is completed, the surface shall be promptly covered with a minimum of a single layer of clean, damp polyester blanket.
- (c) Concrete shall be protected from the harmful effects of sunshine, drying winds, surface dripping or running water, vibration, and mechanical shock. Concrete shall be protected from freezing until at least twenty-four hours after the end of the curing period.
- (d) Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3° in one hour or 20° in twenty-four hours.

E15.3.14 Form Removal

- (a) Forms shall not be removed for a period of at least 24 hours after the concrete has been placed. Removal of forms shall be done in a manner to avoid damage to, or spalling of, the concrete.
- (b) The minimum strength of concrete in place for safe removal of forms shall be 20 MPa.
- (c) Field-cured test specimens, representative of the in-place concrete being stripped, will be tested to verify the concrete strength.

E15.3.15 Patching of Formed Surfaces

- (a) Immediately after forms around top of foundation have been removed, but before any repairing or surface finishing is started, the concrete surface shall be inspected by the Contract Administrator. Any repair of surface finishing started before this inspection may be rejected and required to be removed.
- (b) All formed concrete surfaces shall have bolts, ties, struts, and all other timber or metal parts not specifically required for construction purposes cut back fifty (50) mm from the surface before patching.
- (c) Minor surface defects caused by honeycomb, air pockets greater than 5 mm in diameter, and voids left by strutting, and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the area to be patched and then

applying patching mortar. A slurry grout consisting of water and cement, shall be well-brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck-off slightly higher than the surface and left for one hour before final finishing to permit initial shrinkage of the patching mortar and it shall be touched up until it is satisfactory to the Contract Administrator. The patch shall be cured as specified in this Specification, and the final colour shall match the surrounding concrete.

E15.3.16 Cold Weather Concreting

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

E15.3.17 Anti-Graffiti Coating

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

E15.3.18 Waterproofing

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

E15.3.19 Quality Control

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

E15.4 Measurement and Payment

E15.4.1 Construction of Cast-in-Place Concrete Foundations

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

- (a) Heated Shelter Foundation
- (b) Information Kiosk Foundation
- (c) Bus Stop Flag Foundation
- (d) Concrete Tree Planter
- (e) Concrete Vine Planter

E16. SLOPED CURB

E16.1 Description

- (a) This specification will cover this installation of sloped curb as identified on the drawings.

E16.2 Materials

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

E16.3 Construction Methods

- (a) Construction as per Contract Drawings and as per CW 3310.

E16.4 Measurement and Payment

- (a) Supply and Installation of Sloped Curb will be measured on a lineal basis and paid for at the Contract Unit Price for "Sloped Curb". The length to be paid for shall be the total number of lineal metres supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator.

E17. MONOLITHIC BARRIER CURB AND SIDEWALK

E17.1 Description

- (a) This specification will cover this installation of monolithic barrier curb and sidewalk as identified on the drawings.

E17.2 Materials

- (a) Concrete mix design shall comply with Clause 6.2a) of CW 3310
- (b) All other materials as per Clause 5 of CW 3310.
- (c) Fibre Joint Filler
 - (i) Fibre joint filler shall be rot-proof and of the preformed, non-extruding, resilient-type, made with a bituminous fibre such as "Flexcell," and shall conform to the requirements of ASTM Standard D1751, or approved equal in accordance with B6.

E17.3 Construction Methods

- (a) Construction as per Contract Drawings and as per CW 3310 and CW3325.
- (b) Blockouts for all paving bands in sidewalk to be constructed as per the Drawings. All forming is incidental to the unit price bid for this specification.
- (c) Thickened edge of sidewalk will be incidental to the unit price bid for the concrete sidewalk.
- (d) Fibre Joint Filler
 - (i) Fibre joint filler shall installed adjacent to all new and existing vertical concrete walls and columns. No measurement or payment will be made for this item.

E17.4 Measurement and Payment

- (a) Supply and Installation of monolithic barrier curb and sidewalk will be measured on an area basis and paid for at the Contract Unit Price for "Monolithic Barrier Curb and

Sidewalk". The area to be paid for shall be the total number of square metres supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator.

E18. HYDRO EXCAVATION

E18.1 Description

E18.1.1 General

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

E18.2 Equipment

- (a) Hydro Excavation unit shall be capable of maintaining a minimum working pressure of 10,000 psi, at a rate of flow of 10 to 12 gallons per minute. Unit should be adjustable, so as to provide adequate pressure to remove earthen material identified by the Contract Administrator.
- (b) Spray head shall be equipped with a rotating type nozzle, in order to provide a wider path of cut.

E18.3 Construction Methods

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

E18.3.2 Recovery of Excavated Material

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

E18.3.3 Backfill of Hydro Excavated Hole

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

E18.4 Measurement and Payment

E18.4.1 Hydro Excavation

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

E19. DETECTABLE WARNING TILE

E19.1 Description

- (a) The Work covered under this item shall include all operations related to the supply and installation of Replaceable Cast-in-Place Detectable Tactile Warning Tile at the designated locations, in accordance with this Specification and as shown on the Drawings.

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

E19.2 Materials

E19.2.1 General

- (a) Detectable Warning Tile to be 24"x60" panels of cast in place replaceable system in federal yellow by Armor-Tile as supplied by:

Alsip's Industrial Products
1 Cole Ave
Winnipeg MB, R2L 1J3
Ph: 204-667-3330
Attn. Jason Alsip

E19.2.2 Handling and Storage of Materials

- (a) All materials shall be handled in a careful and workmanship-like manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with the requirements of CSA Standard CAN3 A23.1.8-M77, Storage of Materials except as otherwise specified herein.

E19.3 Equipment

- (a) All equipment shall be of a type approved by the Contract Administrator and shall be kept in good working order.

E19.4 Construction Methods

E19.4.1 Installation

- (a) Detectable Warning Tile shall be installed in accordance with the manufacturer's specifications and instructions.

E19.4.2 Quality Control

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

E19.5 Measurement and Payment

- (a) Supply and Installation of Detectable Warning Tile will be measured on an area basis and paid for at the Contract Unit Price for "Detectable Warning Tile". The area to be paid for shall be the total number of square metres supplied and placed in accordance with this Specification and as measured and accepted by the Contract Administrator.

E20. UNIT PAVERS

E20.1 Description

E20.1.1 General

- (a) Further to CW 3335 this Specification shall cover the:

- (i) supply and installation of interlocking paving stones (unit pavers);
 - (ii) supply and installation of sand setting bed;
 - (iii) supply and installation of grout.
- (b) The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary or and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E20.2 Materials

E20.2.1 Concrete interlocking paving stones (unit pavers) shall be Holland Stone Pavers, supplied by Barkman Concrete, (contact Wayne Wiebe, phone 667-3310), as shown on the Drawings and as follows:

- (a) Transit Blue Holland Paver 60x105x210mm
- (b) Transit Blue Holland Paver 80x105x210mm
- (c) Sierra Grey Holland Paver 60x105x210mm
- (d) Natural Holland Paver 60x105x210mm

E20.2.2 Sand:

- (a) Clean brick sand as joint filler;
- (b) Clean brick sand as minimum 13mm depth setting bed.

E20.2.3 Grout:

- (a) Grout as specified hereinafter shall be used for grouting paving stone under 50mm x 50mm in size. The grout shall have a compressive strength of 25 MPA at 28 days, determined on 50 mm cubes stored and tested in accordance with ASTM C109, and shall consist of normal Portland cement, sand and water;
- (b) The water-cement ratio shall be kept in the range of 0.45 to 0.55;
- (c) The grout shall have between 3% and 5% entrained air;
- (d) Acryl-Stik or approved equal in accordance with B6 to be used in grout at approximately 4 litres Acryl-Stik to 3 litres water;
- (e) Admixtures to be used in the grout shall be supplied in accordance with the requirements of the City of Winnipeg Standard CW 3310;
- (f) The grout shall be of a consistency suitable for the application intended as approved by the Contract Administrator;
- (g) The Contractor shall provide the Contract Administrator with a mix design statement certifying the constituent materials and mix proportions that will be used in the grout for approval prior to construction.

E20.2.4 Geotextile:

- (a) Separation Geotextile Fabric as per CW 3130.

E20.3 Construction Methods

E20.3.1 Contractor to verify the exact dimensions of pavers prior to construction of block outs in concrete sidewalk. Curves for paving bands to be formed in continuous arc and bulkheads provided for daily pours across curves. Curves are not to be used as joints for concrete sidewalk.

- (a) Install concrete sidewalk and blockouts as specified on Drawings. Interlocking paving stones shall be installed in block out in concrete sidewalk as per the Drawings;
- (b) Drill drain holes through concrete as shown on Drawings in all blockouts in concrete pavement;

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

E20.3.2 If cutting of existing concrete sidewalk is required, this shall be incidental to the pay item described in this specification.

E20.4 Measurement and Payment

E20.4.1 Supply and installation of interlocking paving stones will be measured on an area basis and will be paid for at the Contract Unit Price per square metre for "Items of Work", measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

(a) Items of Work:

Supply and Install

- (i) Transit Blue Holland Paver 60x105x210mm
- (ii) Transit Blue Holland Paver 80x105x210mm
- (iii) Sierra Grey Holland Paver 60x105x210mm
- (iv) Natural Holland Paver 60x105x210mm

E21. PLANTER PREPARATION

E21.1 Description

E21.1.1 The following list generally describes the scope of this Section:

- (a) Cultivate subsoil;

- (b) Supply and install drainage course and drainage pipe;
- (c) Supply and install insulation and geotextile;
- (d) Supply and install planting soil mixture in planters;
- (e) Supply and install bark nugget mulch and geotextile.

E21.1.2 Submit to the Contract Administrator samples of the following materials:

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

E21.2 Materials

E21.2.1 Planting Soil: For mix imported topsoil with 20% peatmoss loose by volume, and 5% sand loose by volume. Incorporate bonemeal into planting soil at rate of 5 lbs /cu.yd. of soil mixture. Planting soil items to be comprised as follows:

- (a) Peatmoss: horticultural grade Class "A" decomposed plant material, fairly elastic and homogeneous. Free of decomposed colloidal residue, weed, sulphur and iron. To have pH value of 5.9 to 7.0, 60% organic matter by weight, moisture content not exceeding 15% and water absorption capacity of not less than 300% by weight on oven dry basis.
- (b) Bonemeal: shall be raw bonemeal, finely ground with a minimum analysis of 3% nitrogen and 20% phosphoric acid.
- (c) Imported topsoil: natural, fertile, agricultural soil typical of locality, capable of sustaining vigorous plant growth, from well drained Site that is free of flooding, not in frozen or muddy condition, not less than 6% organic matter to a maximum 25% organic matter by volume, and pH value of 5.9 to 7.0. Free from subsoil, slag or clay, stones, lumps, live plants and their roots, sticks, crabgrass, couchgrass, noxious weeds and foreign matter.
- (d) Sand: hard, granular natural beach sand, washed free of impurities, chemical or organic matter.

E21.2.2 Fertilizer: commercial type with 50% of the elements derived from organic sources. Deliver and store fertilizer in waterproof bags showing weight, analysis and name of manufacturer.

E21.2.3 Separation Geotextile Fabric as per CW 3130 for each application.

E21.2.4 Drainage material as per CW 3120.

E21.2.5 Drainage pipe as per CW 3120.

E21.2.6 Insulation to be 50mm thick rigid closed cell high density foam insulation.

E21.2.7 Bark nugget mulch: commercial grade bagged redwood cedar bark nugget.

E21.3 Construction Methods

- (a) Remove debris, broken roots, branches, stones in excess of 50mm diameter and other deleterious materials. Remove subsoil that has been contaminated with oil, gasoline or calcium chloride. Dispose of removed materials as directed.
- (b) Excavate planters to depths as per the Drawings.
- (c) Place subdrain pipe, drainage fabric and drainage material as per the Drawings. Connect subdrain to catchbasins as shown on the drawings. All Work related to subdrain for planters is incidental to the unit prices bid for planter preparation.
- (d) Install insulation continuous against walls and cover with geotextile.
- (e) Do not spread planting soil mixture until Contract Administrator has inspected subdrain and insulation.

- (f) Mix fertilizer at manufacturer's recommended rate of application. Mix fertilizer thoroughly into upper 150mm of planting soil to be placed.
- (g) Spread planting soil mixture with adequate moisture in uniform layers during dry weather over approved, dry, unfrozen sub-grade, where planting is indicated.
- (h) Bring insulation and planting soil mixture up to 100 mm below finished grade in planters.
- (i) Remove stones, roots, grass, weeds, construction materials, debris and foreign non-organic objects from soil mixture.
- (j) Fine grade entire planting soil area. Eliminate rough spots.
- (k) Compact planting soil to leave surface smooth, uniform, firm against deep foot printing, with a fine, loose texture. Tolerance: plus or minus 15mm of design grade.
- (l) Supply and install 100mm bark nugget mulch in planters.

E21.4 Measurement and Payment

- (a) Planter preparation shall be measured on an area basis and will be paid for at the Contract unit price per square metre for 'Planter Preparation' which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification.

E22. ILLUMINATED SIGN STRUCTURES AND SIGN BOXES

E22.1 Description

E22.1.1 The Work of this specification comprises the furnishing of all labour, equipment and materials required to complete the supply, fabrication and erection of the illuminated signs and related Work as shown on the Drawings and as hereinafter specified, including, but not necessarily confined to the following:

- (a) Supply, fabrication and installation of a two-sided illuminated rapid transit sign as per design Drawings;
- (b) Supply, fabrication and installation of four (4) sign structures for illuminated signs and wireway for electrical connection to shelter.

E22.1.2 Design / Shop Drawings

- (a) The Contractor shall submit dimensioned detailed design drawings within five (5) Business Days when called by the Contract Administrator. The drawings shall show all details of construction, fastenings, lighting, materials and colours.
- (b) The Contractor shall submit stamped structural Engineer's drawings for review and approval within 5 Business Days of Contract Award. Structural Engineer's drawings shall show all details of construction and fastenings for erections and shall be as specified or approved in accordance with B6.
- (c) The Contractor shall submit full colour design drawings of sign faces and sign boxes including materials, lighting components, connections and fastenings for review and approval within 5 Business Days of Contract Award for review and approval by Winnipeg Transit prior to start of manufacture.

E22.2 Materials

- (a) The Structures to be aluminium 6061-T6 structural tubing with architectural 6063-T5 cast aluminium arc forms.
- (b) All fastenings and hardware to be stainless steel 304 or better non-rusting in winter corrosive environment, tamper-proof and flush to exposed surface
- (c) All plates to be aluminum 6061-T6. All anchor bolts to be stainless steel. Coating between metals to be applied with sufficient thickness to prevent galvanic corrosion between steel and aluminium.

- (d) All paint to be powder paint. Silver colour to be PM211S11 (sparkle silver) by Protech. Blue colour to be 5005 38/40010 by Tiger Drylac.
- (e) Provide a detailed parts list to Winnipeg Transit including product number, product description, colour and options for all components of the signs and structures.
- (f) Illuminated sign box:
 - (i) Materials shall be free from defects impairing strength, durability or appearance, and be of best commercial quality for use intended.
 - (ii) Materials and methods used to assemble Work of this section shall be of such properties and construction to safely sustain the loads normally imposed thereon, as would be required of this type of installation.
 - (iii) All exposed fastenings shall be of the same material, colour and finish as the metals to which these are supplied, unless otherwise specified or called for on the Drawings.
 - (iv) All metal shall be free from scale, buckles, pits and other defects.
 - (v) Sign components and construction shall be as shown on the Drawings and as approved by the Contract Administrator.
 - (vi) Signs to be constructed of 20 ga. sheet metal with 12.5 mm F-Section vinyl retainers. Cabinet to be painted to match sign structure. Paint – PM211S11 (sparkle silver) by Protech.
 - (vii) Lamps to be white LED strips. Contractor to provide lighting schematic including ballast on shop drawings. Lamps and ballasts to be high output. Light levels to meet or exceed existing illuminated structures on Graham Avenue.
 - (viii) Acrylic to be SG (sign grade).
 - (ix) Polycarbonate face to be 4.6 mm (3/16") clear Lexan.
 - (x) Background to be white.
 - (xi) Copy to be full colour rapid transit logo as per the design Drawings.
 - (xii) All graphics to be screen printed on 3M day/night film.
 - (xiii) All Work, materials and final sign box to be CSA compliant.

E22.3 Construction Methods

E22.3.1 General Requirements

- (a) Proportion items to meet the National Building Code and Manitoba Building Code. Items shall support loads recommended by the Code and local standards for wind and snow loading unless specific loads are indicated on the Drawings.
- (b) Fabricate Work to shape and size with sharp lines, even curves and smooth surfaces. Connections shall be securely welded, bolted or riveted. Bolted and riveted connections are not permitted in exposed areas of the sign. Welds shall be dressed smooth on exposed surfaces. Welds/joins shall not be visible upon completion of painting operations. Rabbets, lugs and brackets shall be provided so that the Work can be assembled in a neat substantial manner. Thickness of metal and design of assembly and support shall give ample strength and stiffness.
- (c) Exposed ends and edges of metal shall be smooth. Joints exposed to the weather shall be formed to exclude water or to drain.
- (d) Fit and shop assemble structure as one piece and deliver to the Site. Sign boxes can be delivered separately for installation on site.
- (e) Prior to proceeding with shop fabrication, take all necessary field measurements to verify dimensions or calculations from Drawings.
- (f) Fabricate Work in strict accordance with shop drawings, and in general to details, sizes, materials shown on Drawings and specified herein.

- (g) Assembly: Material intended for use in the various assemblies shall be straight, clean, sharply defined profiles, assembled in such a way that no disfigurements will show in the finished Work, or impair the strength.
- (h) Welding: All welding shall conform to the requirements of the current CSA Standard W.59 and the fabricator shall be fully approved by the Canadian Welding Bureau, in conformance with the requirements of the current CSA Standard W.47. Welding shall be done by currently licensed welders only and certified to design welds.
- (i) Manufacturer shall be a member of the Canadian Welding Bureau, or governing body where manufacture is in another country, and certified to design welds
- (j) Welding splatter and other fabrication burrs where exposed shall be ground or filed smooth and left ready for subsequent operations.
- (k) Finish: Fabricated material Work shall be delivered with e-coating, shop coat primer and paint, or other finish as specified.
- (l) Following installation, apply a touch up coat of shop primer and powder paint to match finish to all surfaces where finish has been removed and to installation devices such as bolts, screws, welds and the like. Application of touch up primer and paint must follow approved method of field repair acceptable to Contract Administrator.

E22.3.2 Quality Control

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

E22.3.3 Fabrication

- (a) Fabrication shall be carried out in accordance with these Specifications and Drawings which form a part of this Contract.
- (b) Curved angle portions of sign structure are to be one piece custom cast aluminium.
- (c) All joints in structure are to be filled and sanded prior to cleaning for paint preparation.
- (d) Vinyl graphics to be applied to second surface of Lexan background.
- (e) The workmanship shall meet established practice in modern shops.
- (f) If damage occurs during fabrication, the Contract Administrator shall be notified to facilitate the implementation of remedial measures. Remedial repair measures will be subject to the approval of the Contract Administrator. Their cost will be paid by the Contractor.
- (g) Dimensions and fabrication which control the field matching of parts shall receive careful attention in order to avoid field adjustments.
- (h) The material shall be clean, free from rust, mill scale, and other foreign matter before being worked in the shop.
- (i) All portions of the Work shall be neatly finished. Shearing, cutting, chipping and machining shall be done neatly and accurately. Finished members shall be true to line, free from twists, bends open joints, sharp corners and edges.

E22.3.4 Painting

- (a) Clean all metal thoroughly and apply recommended primer.
- (b) All aluminium to be sanded prior to powder painting.
- (c) Apply all materials under adequate illumination, spread evenly and flow on smoothly without runs or sags.

- (d) All coats must be thoroughly dry before applying succeeding coats.
- (e) All Work where a coat of material has been applied must be inspected and approved by the Contract Administrator before the application of the succeeding specified coat, otherwise no credit for the coat applied will be given, and the Contractor shall then assume the responsibility and recoat the Work in question. Report each coat applied to the Contract Administrator when completed for inspection and approved to comply with the above. Where manufacture is not in Winnipeg the Contractor is to supply digital photos via email of each step for review and approval prior to proceeding to next step.

E22.3.5 Samples

- (a) A sample is to be manufactured and delivered for the sign structure and sign box by September 31, 2009. The sample is to be reviewed and approved by Transit prior to manufacture of signs. Cost of samples is to be incidental to the unit prices bid on this project. The sample shall be the minimum acceptable standard for all materials, workmanship and finishes. If prototype is approved it may be used as a unit to fulfil the Contract quantities.

E22.3.6 Installation and Co-ordination with Others

- (a) The Contractor is advised of the following:
 - (i) All signs to be installed on the existing building. As part of the structural design the Contractor is to review the existing building and ensure that it is structurally capable of supporting the signs.
 - (ii) Type A illuminated signs on columns to be supplied and installed by Enseicom. Contractor to coordinate to ensure sign box will fit within structure and all electrical connections are provided for.
 - (iii) Electronic bus departure display signs to be supplied and installed by Trueform Engineering. Contractor to coordinate to ensure display will fit with structure and all electrical connections are provided for.
 - (iv) Contractor to ensure sign is installed at heights as per the drawings.
 - (v) Wireways to be installed on opposite side of pillars with stainless steel fastenings. Wireway construction and installation is incidental to the unit price for sign structures.
 - (vi) Contractor to ensure final electrical connections can be made by electrical contractor to electrical source. All electrical work to be done by a certified journeyman electrician.
 - (vii) The Contractor will notify the Contract Administrator of installation date with a minimum of three (3) working days notice. Contractor is to have a listing of all completed and pending Work prepared for each Site meeting.
 - (viii) Any damage to the illuminated structure or signs, incurred during fabrication, delivery, installation etc., is to be repaired to the satisfaction of the Contract Administrator within three (3) working days of installation.
 - (ix) Contractor to supply a field repair kit including primer, paint, custom fastenings and hardware for each sign to Winnipeg Transit at time of installation.

E22.4 Measurement and Payment

- (a) Supply and installation of Illuminated Rapid Transit Sign shall be measured and paid for at the contract unit price for "Illuminated Rapid Transit Sign" measured and specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this specification.
- (b) Supply and installation of Sign Structures for Illuminated Signs shall be measured and paid for at the contract unit price for "Sign Structures for Illuminated Signs" measured and specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this specification.

E23. STAINLESS STEEL CABLE TRELLIS

E23.1 Description

E23.1.1 The Work of this section comprises the furnishings of all labour, equipment, services and materials required to complete the supply and installation of the stainless steel cable trellis on the existing concrete pillars.

E23.2 Material

E23.2.1 Each pillar to have eight (8) 4.0m long vertical cables with stainless steel studs at each end and along cable as required.

E23.2.2 Stainless steel cable trellis to be System 2000-60 trellis system by Secosouth, Inc. 1-888-535-7326.

E23.3 Construction Methods

E23.3.1 Contractor to mark out cable installation on site for review and approval by Contract Administrator prior to installation.

E23.3.2 Install tensioning studs and cable as per manufacturer's specifications. Cables to be set 100mm from wall.

E23.3.3 All chemical fastenings to be appropriate for exterior conditions.

E23.4 Measurement and Payment

- (a) Supply and installation of stainless steel cable trellis will be measured on a unit basis and will be paid for at the Contract Unit Price for "Supply and Install Stainless Steel Cable Trellis", in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator.

E24. PLANT MATERIAL

E24.1 Description

E24.1.1 General

- (a) The following list generally describes the scope of this section:
 - (i) Supply and planting of trees, shrubs and vines;
 - (ii) Maintenance to date of total performance.
- (b) Obtain approval of plant material at source.
- (c) Notify Contract Administrator of source of material at least 7 days in advance of shipment. No Work under this Section is to proceed without approval.
- (d) Acceptance of plant material at source does not prevent rejection at Site prior to or after planting operations.
- (e) Source of all plant material to be from an area within the same hardiness zone and soil conditions as Winnipeg.

E24.1.2 Shipment and Pre-Planting Care

- (a) Co-ordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting. Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of planting stock with rope or wire which would damage bark, break branches or destroy natural shape of plant. Give full support to root ball of large trees during lifting.
- (b) Cover plant foliage with tarpaulin, and protect bare roots by means of dampened straw, peatmoss, sawdust or other acceptable material to prevent loss of moisture during transit and storage.

- (c) Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 50 mm diameter with wound dressing.
- (d) Keep roots moist and protected from sun and wind. Heel-in vines, which cannot be planted immediately, in shaded areas, and water well.

E24.2 Materials

E24.2.1 Water should be potable and free of minerals, which may be detrimental to plant growth.

E24.2.2 Anti-desiccant should be wax-like emulsion to provide film over plant surface reducing evaporation but permeable enough to permit transpiration.

E24.2.3 Wound dressing should be horticulturally accepted non-toxic, non-hardening emulsion.

E24.2.4 Plant Material

- (a) Quality and Source: Comply with City of Winnipeg tree planting guidelines, referring to size and development of plant material and root ball. All plant material to be approved by City and Contract Administrator at source.
- (b) Measure plants when branches are in their natural position. Height and spread dimensions refer to main body of plant and not from branch tip to branch tip. Use trees of No. 1 grade.
- (c) Additional plant material qualifications:
 - (i) Use shrubs and vines with strong fibrous root system free of disease, insects, defects or injuries and structurally sound.
 - (ii) Trees must have been root pruned regularly, but not later than one growing season prior to arrival on Site.

E24.2.5 Approval required for plant material, which has been held in cold storage.

E24.2.6 Acceptable if containers large enough for root development. Shrubs and vines must have grown in container for minimum of one growing season but not longer than two. Root system must be able to "hold" soil when removed from container. Plants that have become root bound are not acceptable. Container stock must have been fertilized with slow releasing fertilizer.

E24.2.7 Substitutions to plant material as indicated on plantings plan are not permitted unless written approval has been obtained as to type, variety and size prior to award of Contract. Plant substitutions must be similar species and of equal size to those originally specified.

E24.2.8 Root balls

- (a) Deciduous trees in excess of 3 m height must have been dug with large firm ball. Root balls must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light sandy or rocky soil. Lift root ball from hole, place in wire basket designed for purpose and line with burlap. Secure root balls with burlap, heavy twine and wire basket. Protect root balls against sudden changes in temperature and exposure to heavy rainfall. Take care not to injure trunk of tree with wire basket ties or rope.
- (b) Tree spade material shall not be accepted. Unless dug in field and secured as above.

E24.3 Construction Methods

- (a) Stake out location of trees, shrubs and vines as per the Construction Drawings. Obtain approval by City and Contract Administrator prior to excavating.
- (b) Apply anti-desiccant in accordance with material manufacturer's instructions only as required.
- (c) Co-ordinate operations. Keep Site clean and planting holes drained. Immediately remove soil or debris spilled onto pavement.

E24.3.2 Planting Time

- (a) Plant deciduous plant material during dormant period, before buds have broken. Plant material noted for spring planting only, must be planted in dormant period.
- (b) When permission has been obtained to plant materials after buds have broken, spray plants with anti-desiccant to slow down transpiration prior to transplanting.
- (c) When permission has been obtained, shrubs and perennials growing in containers may be planted throughout growing season.
- (d) Plant only under conditions that are conducive to health and physical conditions of plants.
- (e) Provide planting schedule. Executing planting operations over long period using limited crew will not be accepted.

E24.3.3 Excavations

- (a) Prepare planters as shown on the Drawings and as specified.
- (b) Protect bottom of excavations against freezing.
- (c) Remove water, which enters excavations prior to planting. Ensure source of water is not ground water.

E24.3.4 Planting

- (a) Plant trees, shrubs and vines vertically with roots placed straight out in hole. Orient plant material to give best appearance in relation to structure, roads and walks.
- (b) Place plant material to depth equal to depth they were originally growing in nursery. Allow for soil settlement in planting.
- (c) With balled and burlapped roots balls, loosen burlap and cut away minimum top 1/2 without disturbing root ball. Cut vertical slits in remaining burlap around root ball at 250mm intervals. Remove all rope, string, or other ties from around trunk. Do not pull burlap or rope from under root ball. With container stock, remove entire container without disturbing root ball. Non bio-degradable wrappings must be removed, wire baskets to be cut vertically and the top rings bent over below grade.
- (d) Tamp planting soil around root system in layers of 150mm eliminating air voids. Frozen or saturated planting soil is unacceptable. When 2/3 of planting soil has been placed, fill hole with water. After water has completely penetrated into soil, complete backfilling.
- (e) Build 100 mm deep saucer around outer edge of hole to assist with maintenance watering. Install 100mm depth wood chip mulch in saucer as shown on drawings.
- (f) When planting is completed, give surface of planting saucer dressing of organic 10-6-4 fertilizer at rate of 12 kg/100 m for shrub beds or 40 to 50 g/mm of calliper for trees. Mix fertilizer thoroughly with top layer of planting soil and water in well.

E24.3.5 Prune trees and shrubs after planting only as required to remove broken diseased or dead branches. Employ clean sharp tools and make cuts flush with main branch, smooth and sloping as to prevent accumulation of water.

E24.3.6 Maintenance

- (a) After completion of planting operation to the satisfaction of the Contract Administrator and City of Winnipeg, the Contractor shall be responsible for the maintenance of the plant material until date of Total Performance and commencement of two year warranty.
- (b) Replace any dead or damaged plant material during the maintenance period, including replacement of vandalized material.
- (c) Water sufficiently to maintain optimum growing conditions. Ensure adequate moisture in root zone at freeze-up.

- (d) The Contractor shall provide all necessary equipment, including: tractors, mowers, hand mowers, trimmers, fertilizer spreaders, pruning tools, hoses, water meters, and any other items necessary for the maintenance of the plant material indicated in this Specification.
- (e) Remove all weeds and debris from planters on a weekly basis.
- (f) Turn and top up mulch in planters prior to start of extended maintenance.
- (g) Personnel
 - (i) The Contractor shall provide all necessary personnel for the ongoing maintenance operations.
 - (ii) Personnel should have at least one year of experience in landscape maintenance and should be under the direction of a foreman, in all cases, with not less than five years of experience with similar maintenance operations.

E24.3.7 Maintenance Methods

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

E24.3.8 Fertilizing

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

E24.3.9 Spraying

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

E24.3.10 Insects and Diseases

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

E24.4 Measurement and Payment

E24.4.1 Supply and installation of interlocking paving stones will be measured on a Unit basis and will be paid for at the Contract Unit Price per unit for "Items of Work", measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

- (a) Items of Work:
 - Supply and Install
 - (i) Discovery Elm
 - (ii) Summer Wine Ninebark
 - (iii) Snow Pavement Rose
 - (iv) Virginia Creeper

E25. EXTENDED MAINTENANCE

E25.1 Description

E25.1.1 This Specification shall deal with the maintenance of the trees and vines for two (2) calendar years after the date of the Total Performance.

E25.2 Materials

E25.2.1 The Contractor shall provide all necessary equipment, including: tractors, trimmers, fertilizer spreaders, pruning tools, water trucks, hoses, water meters, and any other items necessary for the maintenance of the area indicated in this Specification.

E25.2.2 The Contractor shall provide all necessary personnel for the ongoing maintenance operations.

E25.3 Construction Methods

E25.3.1 The following areas shall be part of the maintenance jurisdiction:

- (a) The trees and vines as indicated on the Drawings;
- (b) Mulch in planters as indicated on the Drawings.

E25.3.2 Maintenance of Trees and Vines

(a) Watering

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

E25.3.3 Fertilizing and pest control

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

E25.3.4 Weeding

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

E25.3.5 Other Maintenance

- (a) Tighten, or remove, turnbuckles or guy wires for trees as required or directed by the Contract Administrator.
- (b) Straighten trees as required and directed by the Contract Administrator.
- (c) Remove stakes and guys prior to end of maintenance.

E25.3.6 Replacements

- (a) The Contractor shall agree and guarantee to replace and replant any nursery stock found dead or in poor condition during and at the completion of the maintenance period.

- (b) All plant material to be replaced and maintained for a minimum of 30 days prior to end of maintenance period.
- (c) Replaced plant material to be maintained for two (2) years following date of replacement and is subject to the same conditions for warranty and maintenance as original planting. Where a tree has died in the same location a second time the tree hole is to be filled, the surface repaired to match surrounding area and a new location for the replacement tree determined by the Contract Administrator.
- (d) "Poor Condition" shall be interpreted as meaning nursery stock in which branches are dead or dying, or have not shown satisfactory growth of leaves.
- (e) All replacements shall be of same size and species, as specified.

E25.3.7 Quality Assurance

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

E25.4 Measurement and Payment

- (a) Extended Maintenance will be measured on a per year lump sum basis and paid for at the per year Contract Lump Sum Price "Extended Two Year Maintenance", in accordance with this Specification and accepted by the Contract Administrator.

E26. PAINTING OF TERMINAL CEILING

E26.1 Description

E26.1.1 The Work comprises the furnishings of all labour, equipment, services and materials required to complete the application of paint on the ceiling of the terminal area.

E26.1.2 Ceiling area shall be understood to include all ceiling bounded by the building terminus to the north, the wall leading to the interior building space to the east, the canopy extension to the south, and the building terminus to the west.

E26.1.3 Submittals

- (a) Sample of each paint type applied to substrate for approval of colour.
- (b) Provide product data on specified product, describing physical characteristics and maintenance instructions.

E26.2 Materials

- (a) Concrete cleaner: Devoe Devprep 88 Heavy Duty Cleaner Cat. #788T0000.
- (b) Concrete primer / sealer: Rain Guard Surface-Seal II Clear Primer.
- (c) Concrete paint: Rain Guard Color-Lok High Performance Masonry Stain in white.
- (d) Stucco Paint: Decra-Flex 1130 Elastomeric Coating System, satin sheen in white.
- (e) Metal Primer: Devoe Devguard 4160 Alkyd Structural Primer in white.
- (f) Metal Paint: Devoe Devguard 4336DTM Urethane- Alkyd Semi-gloss Enamel in white.
- (g) Accessories and Application Equipment: As per manufacturer's specifications for each product.

E26.3 Construction Methods

- (a) Mask all exiting lighting and appurtenances identified by the Contract Administrator.

- (b) Preparation and painting to be done in time frame between removal of existing lighting and installation of new lights. Contractor to ensure new lighting is not damaged by painting.
- (c) Painting to be done during appropriate weather conditions.
- (d) Contractor to clean concrete surface with concrete cleaner as per manufacturer's specifications.
- (e) Contractor to apply one coat of concrete primer / sealer over concrete.
- (f) Contractor to apply two coats of concrete paint over primer / sealer.
- (g) All stucco, metal, wood or other surfaces to be cleaned, sanded, scraped, etc. as required to prepare the surface to accept new paint. All loose old paint to be removed. Contractor to ensure products used for cleaning are appropriate for surface and final paint product.
- (h) Contractor to apply two coats of stucco paint over prepared surface for stucco wood and pre-painted concrete.
- (i) Contractor to apply one coat of metal primer to all metal surfaces following cleaning.
- (j) Contractor to apply two coats of metal paint over metal primer.

E26.4 Measurement and Payment

- (a) Painting of Terminal Ceiling will be measured and paid for on a lump sum basis at the Contract Unit Price for "Painting of Terminal Ceiling" in accordance with this Specification and as measured and accepted by the Contract Administrator.

E27. ELECTRICAL WORKS

E27.1 Description

E27.1.1 General

- (a) This specification will cover this removal and installation of all electrical works identified on the drawings.

E27.1.2 Details

- (a) Provide electrical demolition as indicated on drawings and as required to complete Work.
- (b) Coordinate with signage and site works contractors for timing of Work and Site access requirements.
- (c) All Sites to be left in a safe manner for installation of new Work.
- (d) All Work shall be executed in a first class and workmanlike manner. All supports, hangers, and securing devices shall be solid and substantial. All Work shall be laid out neatly in its mechanical appearance. It shall be logically arranged for simplicity of installation and accessibility.
- (e) Provide corrected "as-built" drawings on completion of the project. All underground services shall be indicated on as-builts and dimensioned.
- (f) Provide shop drawings for approval of all major electrical items. Provide three (3) copies of manufacturers maintenance instructions bound in hard covered book for each piece of major electrical equipment.
- (g) Obtain all permits and inspections. Provide copies of all paperwork to the Contract Administrator prior to completion of the Work.

E27.2 Materials

- (a) Furnish all labour, new material, equipment and services for the complete installation of the electrical Work as shown on the plans and specified. Complete system to operate to total satisfaction of the Contract Administrator.

- (b) Conform with all Codes and pay all permits and Fees. Upon completion, present a "Certificate of Approval" for electrical work from the Inspection Department.
- (c) Wiring shall be copper, RW-90, insulated, minimum #12 AWG.
- (d) Wire and connect to signs and shelters where indicated. Provide lockable, weatherproof disconnect switches for each sign. Locate as directed on site.

E27.3 Construction Methods

- (a) Install all Work promptly and in advance of concrete pouring and/or construction.
- (b) Examine the Site and local conditions affecting the Work under this contract.
- (c) Identify circuits/equipment with lamaroid nameplates.
- (d) All electrical apparatus shall be properly grounded according to the latest edition of the "Canadian Electrical Code"
- (e) All equipment, wiring, conduit, grounding, seals, etc., shall be in compliance with the latest edition of the "Canadian Electrical" and local "Codes". Wiring in finished grade shall be in rigid PVC conduits, complete with ground conductor.
- (f) Co-ordinate installation with Manitoba Hydro and City of Winnipeg. Installation to conform with all utility requirements.
- (g) Provide ground rod and grounding connections to suit Manitoba Hydro and City of Winnipeg Inspection Department.
- (h) The Contractor shall be responsible to make good all "Cutting and Patching" required by his section of the Contract. Include all trenching, backfilling and surface repair. Contractor to push wires where possible at all locations, where existing surface is to remain.
- (i) Contractor to co-ordinate location of sleeves in concrete foundations for shelters and signs with Contract Administrator.
- (j) Installation of signs and shelters will be provided under separate contract. Coordinate with Contract Administrator for electrical connection requirements and timing of installation.
- (k) All distribution equipment to be weather proof and lockable.
- (l) The Contractor shall carefully examine all drawings relating to the Work, to be certain that the Work under this Contract can be carried out and, prior to the submission of his/her Bid in accordance with Part B, report at once to the Contract Administrator any defect, discrepancy, omission or interference affecting the work of this section or the guarantee of same.
- (m) The Contractor shall be responsible for any damage caused the City or their Contractors by improperly carrying out this contract.
- (n) The Contractor shall guarantee the satisfactory operation of all Work and apparatus included and installed under this section for a period of two (2) years after the final acceptance of the project, in accordance with D22

E27.4 Measurement and Payment

- (a) Electrical works will be measured and paid for on a lump sum basis at the Contract Unit Price for "Electrical Works" in accordance with this Specification and as measured and accepted by the Contract Administrator.