



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 447-2007

WINSMART ACTIVE TRANSPORTATION BIKEWAY

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 WINSMART ACTIVE TRANSPORTATION BIKEWAY

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, July 11, 2007.

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

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

B3. SITE INVESTIGATION

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

B4. ENQUIRIES

B4.1 All enquiries shall be directed to the Contract Administrator identified in D3.1.

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

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

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

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

B5. ADDENDA

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

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

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

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

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

B6. SUBSTITUTES

- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B15.
- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B7. BID COMPONENTS

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
 - (b) Form B: Prices;

- (c) Form G1: Bid Bond and Agreement to Bond, or
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
a certified cheque or draft;

- 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.
- B7.5 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, may result in the Bid being determined to be non-responsive.
- 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 Branch
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, should 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 shall be printed below such signatures.

B8.4.2 All signatures should be witnessed, except where a corporate seal has been affixed.

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.

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

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 three (3) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the

Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

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

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, and shall be witnessed or sealed as required.

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 Branch, 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 Branch internet site 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 Branch internet site 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 (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);
- (c) Total Bid Price;
- (d) proposed time frames;
- (e) 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.

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 Subject to B16.2, where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid.

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 Branch internet site at <http://www.winnipeg.ca/matmgt>.
- C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Construction*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of the development of new asphalt pathways including the repair of existing sidewalks and pavements, the construction of concrete sidewalks, unit paving, concrete curbs, concrete piles, chain link fence, and site furniture.

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

- (a) Sawcut, remove and replace existing concrete sidewalk, pavement
- (b) Removal of chain link fence.
- (c) Relocation of chain link gate
- (d) Tree Removal
- (e) Supply and installation of asphalt pathway
- (f) Supply and installation of heavy duty asphalt paving
- (g) Supply and installation of back lane concrete pavement
- (h) Supply and installation of concrete sidewalk
- (i) Supply and installation of unit pavers on concrete base.
- (j) Supply and installation of root barrier
- (k) Line Painting
- (l) Supply and installation of CIP concrete curb, curb and gutter, landscape curb
- (m) Supply and installation of CIP Concrete Piles
- (n) Supply and installation of benches in landscape curb
- (o) Supply and installation of 1.8m ht. chain link fence
- (p) Supply and installation of concrete filled steel bollards
- (q) Sod Repair.
- (r) Planter bed preparation
- (s) Adjustment of catch basin/manholes

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is McGowan Russell Group, represented by:

Aaron Hirota, MALA, CSLA
Landscape Architect
200-120 Fort Street, Winnipeg, MB, R3C1C7
Telephone No. (204) 956-0396
Facsimile No. (204) 956-1265

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

D3.3 At the pre-construction meeting, the Contract Administrator will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D4. CONTRACTOR'S SUPERVISOR

D4.1 At the pre-construction meeting, the Contractor shall identify his designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D5. NOTICES

D5.1 Except as provided for in C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.

D5.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D5.3, D5.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the address or facsimile number identified in D3.1.

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

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

D5.4 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following address or facsimile number:

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

D6. FURNISHING OF DOCUMENTS

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

SUBMISSIONS

D7. AUTHORITY TO CARRY ON BUSINESS

D7.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on

business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

D8. SAFE WORK PLAN

- D8.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D8.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.

D9. INSURANCE

- D9.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability 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) 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.
- D9.2 Deductibles shall be borne by the Contractor.
- D9.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D9.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least fifteen (15) Calendar Days prior written notice to the Contract Administrator.

D10. PERFORMANCE SECURITY

- D10.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
 - (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
 - (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.

D10.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.

D10.2 If the bid security provided in his Bid was not a certified cheque or draft pursuant to 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 but in no event later than the date specified in C4.1 for the return of the executed Contract.

D11. DETAILED PRICES

D11.1 The Contractor shall provide the Contract Administrator with a detailed price breakdown (Form I: Detailed Prices) 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 C4.1 for the return of the executed Contract.

D11.2 The Contractor shall state a price for each item or sub-item of the Work identified on Form I: Detailed Prices. The detailed prices must be consistent with the price(s) provided in the Contractor's Bid.

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 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 C4.1 for the return of the executed Contract.

D13. EQUIPMENT LIST

D13.1 The Contractor shall provide the Contract Administrator with a complete list of the equipment which the Contractor proposes to utilize (Form K: Equipment List) at 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 C4.1 for the return of the executed Contract.

D14. DETAILED WORK SCHEDULE

D14.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D14.2 The detailed work schedule shall consist of the following:
(a) a Gantt chart for the Work based on the C.P.M. schedule;

D14.3 Further to D14.2(a), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

SCHEDULE OF WORK

D15. COMMENCEMENT

D15.1 The Contractor shall not commence any Work until he is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.

D15.2 The Contractor shall not commence any Work on the Site until:
(a) the Contract Administrator has confirmed receipt and approval of:
(i) evidence of authority to carry on business specified in D7;

- (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D8;
 - (iv) evidence of the insurance specified in D9;
 - (v) the performance security specified in D10;
 - (vi) the detailed prices specified in D11;
 - (vii) the Subcontractor list specified in D12;
 - (viii) the equipment list specified in D13;
 - (ix) the detailed work schedule specified in D14
- (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.

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

D16. WORKING DAYS

D16.1 Further to C1.1(gg), the Contract Administrator's determination of whether or not atmospheric and Site conditions are such that a Working Day is deemed to have elapsed may be based at one time on one type of work while at another time a Working Day may be based on another type of work. When more than one type of major work is involved, the quantity of equipment that must be able to work in order to meet the requirements of a Working Day may vary considerably from that specified in the General Conditions.

D16.2 In the event that incidental work is behind schedule which, in the opinion of the Contract Administrator, should have been or could have been carried out by the Contractor in conjunction with or immediately following work of a major type, the City hereby reserves the right to charge Working Days on the incidental work until such time as it is up to schedule.

D16.3 When the major type of work involves restoration of the site to the condition it was prior to rainfall, Working Days shall not be charged.

D16.4 The Contract Administrator will furnish the Contractor with a daily record for each major type of work showing various information concerning the equipment, the time it worked, could have worked and Working Days charged. This report is to be signed each day by an authorized representative of the Contractor.

D17. SUBSTANTIAL PERFORMANCE

D17.1 The Contractor shall achieve Substantial Performance within Thirty (30) consecutive Working Days of the commencement of the Work as specified in D15.

D17.2 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 reinspected.

D17.3 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.

D18. TOTAL PERFORMANCE

D18.1 The Contractor shall achieve Total Performance within Thirty-Five (35) consecutive Working Days of the commencement of the Work as specified in D15.

D18.2 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 reinspected.

D18.3 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.

D19. LIQUIDATED DAMAGES

D19.1 If the Contractor fails to achieve Substantial Performance in accordance with the Contract by the day fixed herein for Substantial Performance, the Contractor shall pay the City Five Hundred dollars (\$500.00) per Working Day for each and every Working Day following the day fixed herein for Substantial Performance during which such failure continues.

D19.2 The amount specified for liquidated damages in D19.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Substantial Performance by the day fixed herein for same.

D19.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D20. SCHEDULED MAINTENANCE

D20.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:

(a) 30 day sod maintenance as specified in CW3510;

D20.2 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

D21. JOB MEETINGS

D21.1 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.

D21.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D22. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D22.1 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).

MEASUREMENT AND PAYMENT

D23. PAYMENT

D23.1 Further to C12, effective January 1, 2007 the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D24. WARRANTY

D24.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total 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.

D24.1.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

FORM H1: PERFORMANCE BOND
(See D10)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$_____)

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

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

_____ day of _____, 20____, for:

BID OPPORTUNITY NO. 447-2007

WINSMART ACTIVE TRANSPORTATION BIKEWAY

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

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

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

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

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

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

_____ day of _____, 20____.

SIGNED AND SEALED
in the presence of:

(Witness)

(Name of Principal)

Per: _____ (Seal)

Per: _____

(Name of Surety)

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

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

(Date)

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

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 447-2007

WINSMART ACTIVE TRANSPORTATION BIKEWAY

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

(Name of Contractor)

(Address of Contractor)

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

_____ Canadian dollars.

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

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

Partial drawings are permitted.

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

(Address)

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

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

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

(Date)

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

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

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

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM K: EQUIPMENT
(See D13)

WINSMART ACTIVE TRANSPORTATION BIKEWAY

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

FORM K: EQUIPMENT
(See D13)

WINSMART ACTIVE TRANSPORTATION BIKEWAY

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

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

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

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
L1	Layout Plan – Part 1 of 3
L2	Layout Plan – Part 2 of 3
L3	Layout Plan – Part 3 of 3
L4	Details

GENERAL REQUIREMENTS

E2. PROTECTION OF SURVEY INFRASTRUCTURE

- E2.1 Notwithstanding clause 4 “Protection of Survey Bars” of the Standard Provisions: Current legislation, The Surveys Act, places the onus on those undertaking construction to protect the Survey Infrastructure from damage as a result of their activity.
- E2.2 Further to GC:6.28 (g), at least 72 hours prior to the commencement of the On-Site Work the Contractor shall contact the City of Winnipeg, Geomatics Services Branch at 986-4826 (8:00 am to 4:00 pm Monday to Friday excluding holidays) to obtain underground clearance. Geomatics Services will locate and mark all known outline survey monuments and geodetic control monuments and confirm the physical condition of those monuments upon completion of construction, at no cost to the Contractor.
- E2.3 Where a survey post, bar or control monument lies in the line of the proposed Work and must be disturbed, the Contractor shall provide the Contract Administrator with 48 hours notice to permit referencing for future replacement, at no cost to the Contractor. Failure to provide the specified notice shall result in the Contractor paying for all costs associated with replacing or relocating the disturbed outline survey monuments and geodetic control monuments.
- E2.4 Survey monuments and geodetic control monuments at or adjacent to the Site, not in the line of the proposed construction, that are damaged or disturbed by the Contractor shall be replaced or relocated by the City or its agent and all associated costs shall be paid for by the Contractor. An approximate estimate of the costs involved to restore a legal survey monument is \$1,000 per bar and \$3,000 per control monument. Contractors must ensure their subcontractors are aware of this clearance procedure and the potential restoration costs.
- E2.5 Where possible, amounts owed to the City in accordance with the above will be deducted from any Protection of survey infrastructure payments to be made by the City to the Contractor.

E3. SITE CONDITION

- E3.1 The Contractor shall examine the Site and make themselves familiar with the existing conditions (both above and below grade) and nature of Work to be done.
- E3.2 Surface and sub-surface conditions shown on the Drawings and included herein are provided for general information and variations there from shall not affect the terms of the Contract.
- E3.3 The Contractor shall set all necessary control lines, benchmarks, survey, elevation stakes and layout in accordance with the individual Site conditions and in consultation with the Contract Administrator.

E4. PEDESTRIAN SAFETY AND TRAFFIC MANAGEMENT

- E4.1 Ambulance/Emergency vehicle access must be maintained at all times.
- E4.2 During the project, a temporary snow fence shall be installed around the excavation area. 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.

E5. CONSTRUCTION FACILITIES AND STAGING

- E5.1 The Contractor shall be responsible for providing his own storage area for storage and handling of all his construction operations. The use of public right-of-ways will not be allowed.

E6. ALL-WEATHER DUMP SITE

- E6.1 The Contractor shall have access to an all-weather dump site throughout the duration of the project. Prior to the start of construction, the Contractor shall provide the Contract Administrator with details in regards to the location of the all-weather dump site.

E7. WATER USED BY CONTRACTOR

- E7.1 Notwithstanding CW 1120.3.7:
 - E7.1.1 Water for use by the Contractor may be obtained from the City of Winnipeg waterworks system.
 - E7.1.2 Should the Contractor wish to obtain water from a City hydrant, he shall make application either in person or by phoning the Permits Clerk at 986-3184 (8:30 am to 4:30 pm Monday to Friday excluding holidays). The Contractor shall advise the Permits Clerk of the hydrant he wishes to use. The Water Services Divisions of the Water and Waste Department will inspect the hydrant to ensure that the location is suitable and that the hydrant is in good working condition. If the requested hydrant is found to be unacceptable, arrangements will be made for the use of an alternate hydrant.
 - E7.1.3 When the application has been approved, the Permits Clerk will contact the Contractor and issue the permit. The permit may not be issued the same day the application is made. The Contractor shall obtain the permit for hydrant use from the Customer Services Division of the Public Works Department, 107-1155 Pacific Avenue. Permit fees will be charged in accordance with the latest version of the Waterworks By-law. All water used shall be metered and protected against contamination by the use of approved backflow prevention devices. The City will rent the meter to the Contractor at the rate established by the Waterworks By-law. The Contractor shall provide a lockable box, piping, valves, and backflow prevention equipment in accordance with Waterwork's guidelines. The backflow preventer(s) must be tested by a plumber licensed to test backflow preventers. The Permits Clerk can provide a list of licensed plumbers and additional information on the requirements for obtaining a use of hydrant permit.
 - E7.1.4 The Contractor shall pay for all water used in accordance with the Waterworks By-law. Sewer charges will not be assessed for water obtained from a hydrant.

E8. EXISTING UNDERGROUND SERVICES

- E8.1 The Contractor's attention is drawn to the existing underground lines or services that may be located in the area of the Work.
- E8.2 The Contractor shall take all necessary precautions when performing the Work to ensure that no damage is done to these existing services.
- E8.3 No responsibility will be assumed by the City for correctness or completeness of the Drawings, when provided, with respect to the existing utilities, pipes or other objects either underground or on the surface, shall not be liable for the incorrectness and inadequacy thereof. It shall be the responsibility of the Contractor to determine the location of all such utilities, pipes and other objects and to make good any damage done to them.
- E8.4 All costs in connection with this item including location of the existing service, repairs to any existing services damaged by the construction operation, etc. shall be included in the unit prices bid for supply and installation of the items included under this Contract.
- E8.5 The Contractor will be required to make his own arrangements in connection with the temporary use of lighting, power, gas, sewer, water or other utilities, and pay all costs in connection therewith.
- E8.6 All necessary permits, fees and other like expenses as well as the cost of temporary connections to existing facilities shall be arranged and paid for by the Contractor.

E9. EXPOSING EXISTING UNDERGROUND SERVICES AND UTILITIES

- E9.1 The exact location and depth of some of the existing underground services and utilities within the project limits are unknown.
- E9.2 Therefore, the Contractor shall supply all labour, equipment and materials required to expose all underground services and/or utilities sufficiently far enough in advance of the proposed Works to permit the Contract Administrator where necessary, to adjust the alignment and grade to avoid existing lines and ducts.
- E9.3 All costs in connection with this item of Work shall be included in the unit price bid for the various bid items.

E10. EXISTING CURB STOP BOXES

- E10.1 During the removal and installation of the concrete pavement, asphalt pathway and unit paving, the Contractor shall take all necessary precautions when Working in the vicinity of any existing curb stop boxes.
- E10.2 All existing curb stop boxes not in use as determined by the Contract Administrator shall be abandoned by removing existing curb stop boxes. All costs associated with the abandoning of curb stop boxes are incidental
- E10.3 Any existing curb boxes requiring final adjustments (horizontal and/or vertical) are incidental.
- E10.4 Any curb stop boxes damaged as a result of the Contractor's operation shall be replaced at his own cost.

E11. LAYOUT OF WORKS

- E11.1 The Contractor will Work from layout information provided in the construction drawings and will be responsible to provide a full time experienced survey crew to layout and continuously check the locations and elevations of all components and paving patterns of the Work included in this Contract.

- E11.2 The Contractor must provide all necessary survey equipment in good operating conditions.
- E11.3 The Contractor shall supply all materials (painting, stakes, ribbon, markers, etc) and labour necessary for the accurate location and setting out of the Work.
- E11.4 From time to time the Contract Administrator may have a survey crew on the Site, but they will check the Work done by the Contractor's survey personnel only. The checking of the Work by the Owner's surveyors will not relieve the Contractor of any responsibility of the correctness of the Work. Should any structure or paving or any part thereof be installed in any location other than that shown on the Drawings, then the error shall be rectified by the Contractor all at his own expense and at the satisfaction of, and in a manner specified by the Contract Administrator.
- E11.5 All costs associated with this item of Work shall be included in the unit prices bid for the supply and installation of the various items in the contract.

E12. PRIVATE SIDEWALKS, SIDE STREET SIDEWALKS

- E12.1 The Contractor shall be responsible for the removal and reinstallation of any concrete paving and/or interlocking paving stones/brick on private sidewalks as a result of vertical grade changes in the proposed pavement. The Contractor shall be responsible for the removal and reinstallation of any concrete and/or interlocking paving stones/ brick on side street sidewalks and City owned Property as a result of vertical grade changes in the proposed pavement.
- E12.2 The removal and reinstallation of concrete sidewalk paving and/or interlock paving stones/brick on private sidewalks, side streets and City owned property, to meet new pavement grades, have been included in the area calculations for these items of Work.

E13. MATCHING EXISTING GRADES

- E13.1 Wherever the proposed sidewalk meets existing pavement, building edge, doorway or property line, the Contractor shall construct the sidewalk to an acceptable grade, as directed by the Contract Administrator, to ensure that proper drainage and accessibility are maintained. Where maintenance of existing grade is not possible, Contractor to adjust grade as directed by the Contract Administrator.
- E13.2 No payment will be made for matching existing grades as this shall be incidental to this specification

E14. ADJUSTMENT OF PAVEMENT AND BOULEVARD STRUCTURES

- E14.1 Further to City of Winnipeg Specification CW 3210 all existing surface utilities within the area of new sidewalk, interlocking paving and full depth patching of existing pavement are to be adjusted to meet finish grades.
- E14.2 Adjustment of pavement and boulevard structures is incidental to the Work with the exception of manholes, catch basins and curb and gutter inlets noted on the drawings as requiring significant adjustment. The adjustment of these structures is to be measured and paid for at the contract unit price per unit adjusted in accordance with CW 3210 including replace, remove or add precast concrete riser sections and compacted granular backfill as required.
- E14.3 All surface utilities are to be provided with cast in place concrete isolation collars as per standard City of Winnipeg details and as per the Drawings. Collar dimensions and forms are to be confirmed on Site by Contract Administrator prior to construction. Installation of new and renewal of existing isolation collars are incidental to the Work.

E15. REMOVALS

- E15.1 Further to City of Winnipeg Specification CW 3110 and due to the extent and nature of underground services in the street right-of-way, the Contractor shall be permitted to use only backhoe type equipment when excavating sub-grade material.
- E15.2 Further to City of Winnipeg Specifications CW 3230 and CW 3235, the Contractor shall sawcut and remove existing concrete sidewalk, back lane pavement, parking lot pavement as shown on the Drawings and as directed by the Contract Administrator. The removal shall include all existing concrete and base courses where applicable.
- E15.3 Description
- E15.3.1 This Specification shall cover the removal of existing:
- (a) Back lane pavement full depth including base courses;
 - (b) Parking lot pavement full depth including base courses;
 - (c) Concrete curb,
 - (d) Concrete curb and gutter;
 - (e) Concrete sidewalk;
 - (f) Chain Link Fence
 - (g) Removal and Relocation of chain link gate
 - (h) Remove and dispose of unsuitable subgrade and replacement with compacted limestone sub-base.
 - (i) Remove and dispose of unsuitable subgrade including sawcutting root mass and replacement with compacted limestone sub-base.
- E15.3.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work hereinafter specified.
- E15.4 Equipment
- E15.4.1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good Working order.
- E15.5 Construction Methods
- E15.5.1 The Contractor shall restrict his activities strictly to within the limits of the Works, unless receiving prior written approval from the Contract Administrator.
- E15.5.2 The Contractor shall sawcut, remove and dispose of existing back lane pavement, parking lot pavement, concrete curb, concrete curb and gutter and concrete sidewalk as indicated on the Drawings. In areas where design grade is lower than existing grade or where the base course is contaminated, base courses must be removed full depth. Base courses removal is incidental to the unit price bid.
- E15.5.3 The Contractor shall load and haul all removed material from the Site and dispose of these materials legally at a dump located by the Contractor and approved by the Contract Administrator. Any materials dropped or spilled on any streets during the hauling operations shall be promptly cleaned up at the expense of the Contractor, to the satisfaction of the Contract Administrator.
- E15.5.4 The Contractor shall ensure that upon completion of the removal operations, the Site shall be left free of any hazardous depressions and in a neat condition.
- E15.5.5 Remove and dispose of chain link fence as shown on the drawings. Fill holes from posts with clean earth fill and compact to 98% SPD.

- E15.5.6 If required and at locations directed by the Contract Administrator, the Contractor shall excavate, remove and dispose of unsuitable subgrade material and replace it with compacted granular material in accordance with Specification CW3110.
- E15.5.7 The Contractor shall dispose of all unsuitable and excess materials in accordance with City of Winnipeg Specifications. Disposal is incidental to the unit prices bid.
- E15.6 Method of Measurement
- E15.6.1 The following items will be measured on an area basis for Work completed in accordance with this Specification as determined by the Contract Administrator:
- (a) Sawcut, remove and dispose of existing back lane pavement
 - (b) Sawcut, remove and dispose of existing parking lot pavement
 - (c) Sawcut, remove and dispose of concrete sidewalk
- E15.6.2 The following items will be measured on a length basis for Work completed in accordance with this Specification as determined by the Contract Administrator:
- (a) Sawcut, remove and dispose of concrete curb
 - (b) Sawcut, remove and dispose of concrete curb and gutter
 - (c) Remove and dispose of chain link fence
- E15.6.3 The following items will be measured on a per unit basis for Work completed in accordance with this Specification as determined by the Contract Administrator:
- (a) Relocate existing chain link gate
- E15.6.4 The following items will be measured on a volume basis for Work completed in accordance with this Specification as determined by the Contract Administrator:
- (a) Remove and dispose of unsuitable subgrade and replace with compacted granular sub-base
 - (b) Remove and dispose of unsuitable subgrade including sawcutting root mass and replace with compacted granular sub-base
- E15.6.5 No measurement will be made for stockpiling suitable topsoil, clean earth fill and granular base course as these items are incidental to this specification.
- E15.6.6 No measurement will be made for filling holes/low areas left by excavation and removals operations as this item shall be incidental to this specification.
- E15.6.7 No measurement will be made for the excavation or compaction of the subgrade as this shall be incidental to this specification.
- E15.6.8 No measurement will be made for disposing of surplus fill and unsuitable material as this shall be incidental to this specification.
- E15.7 Basis of Payment
- E15.7.1 The following items will be paid for at the contract unit price per square metre for
- (a) Sawcut, remove and dispose of existing back lane pavement
 - (b) Sawcut, remove and dispose of existing parking lot pavement
 - (c) Sawcut, remove and dispose of concrete sidewalk
- as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.
- E15.7.2 The following items will be paid for at the contract unit price per lineal metre for
- (a) Sawcut, remove and dispose of concrete curb
 - (b) Sawcut, remove and dispose of concrete curb and gutter
 - (c) Remove and dispose of chain link fence

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

E15.7.3 The following items will be paid for at the contract unit price for each item for

(a) Relocate existing chain link gate

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

E15.7.4 The following items will be paid for at the contract unit price per cubic meter for

(a) Remove and dispose of unsuitable subgrade and replace with compacted granular sub-base

(b) Remove and dispose of unsuitable subgrade including sawcutting root mass and replace with compacted granular sub-base

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

E15.7.5 No payment will be made for stockpiling suitable topsoil, clean earth fill and granular base course as these items are incidental to this specification.

E15.7.6 No payment will be made for filling holes/low areas left by excavation and removals operations as this item shall be incidental to this specification.

E15.7.7 No payment will be made for the excavation or compaction of the subgrade as this shall be incidental to this specification.

E15.7.8 No payment will be made for disposing of surplus fill and unsuitable material as this shall be incidental to this specification.

E16. EXCAVATION AND SITE GRADING

E16.1 General

E16.2 The "General Conditions and Supplemental Conditions" of this Specification and all documents listed in the Tender shall apply to and govern all phases of the Work hereinafter specified and/or shown on the Drawings.

E16.3 Description

E16.3.1 The Work of this section comprises the furnishing of all labour, equipment and materials required to complete the Site grading and related Work including, but not necessarily confined to, the following:

(a) Excavation and Grading of the existing Site to the design requirements noted on the Drawings, approved on Site by the Contract Administrator, less the appropriate surface finish allowance.

E16.4 Protection

E16.4.1 Prevent damage to surface or underground utility lines, sods, existing trees to remain, etc. which are to remain. The Contractor shall take special care to protect the existing trees, including root systems and trunks. Make good any damage.

E16.5 Removals

E16.5.1 The Contractor shall restrict his activities strictly to within the limits of the Works, unless receiving prior written approval from the Contract Administrator. The Contractor shall take all precautions to prevent damage to traffic structures, pole lines, adjacent property and he shall be liable for any damages occurring in the performance of this Work.

E16.5.2 The Contractor shall load and haul all rubbish and all other surface litter from the Site and dispose of these materials at dumps located by the Contractor and approved by the Contract Administrator. Any materials dropped or spilled on any streets during the hauling

operations shall be promptly cleaned up by and at the expense of the Contractor, to the satisfaction of the Contract Administrator.

E16.5.3 The Contractor shall ensure that upon completion of the removal operations, the Site is left in a neat condition free from debris, etc.

E16.6 Materials

E16.6.1 Excavated or graded material to be approved before use as fill for grading Work. Protect such approved material from contamination.

E16.7 Earthwork and Grading

E16.7.1 The Contractor shall construct the Site within the limits indicated to the design elevations and gradients noted on the Drawings, less the appropriate surface treatment depths specified and shall excavate, remove and dispose of all unsuitable materials of whatever nature encountered.

E16.7.2 The Contractor shall construct all subgrades in accordance with Geotechnical Report under this Contract.

E16.7.3 The Contractor is advised that there may be a surplus of fill on the Site after the design subgrade level has been achieved. All surplus material will be disposed of as previously stated. No direct payment will be made for disposing of surplus fill as all costs for this Work shall be incidental to the contract.

E16.7.4 Following earth moving, rough grading and compaction, the Work areas shall be fine graded to provide a maximum deviation of 50mm in 10m from the design grade with no low areas that hold water. The finished surface of all disturbed areas shall be dragged and smoothed in such a manner that there are no loose soil particles greater than 50mm in maximum dimensions.

E16.7.5 The Contractor shall construct the subgrade surface to the following depths below the design grades shown on the Drawings for each area:

1.	Shrub bed	550mm
2.	Sod	100mm
3.	Concrete Sidewalk	200mm
4.	Concrete Sidewalk with Unit Paving	273mm
5.	Asphalt Pathway	275mm

E16.8 Method of Measurement/Basis of Payment

E16.8.1 The Contractor is advised that all Work under this section is incidental to the unit prices bid under this contract.

E17. SAWCUTTING PAVEMENT

E17.1 At the limits of excavation, the Contractor shall sawcut the existing to produce a clean straight edge when excavated.

E17.2 No payment will be made for sawcutting, removal and disposal of any surplus material as this shall be incidental to this specification..

E18. CLEARING AND GRUBBING

E18.1 The Contractor is to note that the Clearing and Grubbing is to include the removal of all the individual trees and shrubs as shown on the drawings, as well as all the root masses associated with these trees and shrubs.

E18.2 Construction Methods - as per CW 3010

E18.3 Method of Measurement

E18.3.1 Tree removal will be measured on a per unit basis. The payment shall be the total number of units removed in accordance with this Specification and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E18.4 Basis of Payment

E18.4.1 Tree removal will be paid for at the Contract Unit Price per unit for 'Tree Removal', measured as specified herein, which price shall be payment in full for completing all operations herein described and all other items incidental to the Work included in this Specification.

E19. BASE COURSE MATERIAL

E19.1 This Specification shall supplement Standard Construction Specification CW 3110 and CW 3130.

E19.2 The Work of this section comprises the furnishing of all labour, equipment and materials required to complete the supply and placing of base course material Work as shown on the Drawings and as hereinafter specified, including, but not necessarily confined to, the following:

- (a) Supply and Placement of Base Course Material
- (b) Supply and Placement of Sub-Base
- (c) Supply and Installation of Separation/Reinforcement Geotextile Fabric
- (d) Compaction

E19.3 There will be no separate measurement and payment supply and placement of sub-base. All Work shall be considered incidental to this specification

E19.4 There will be no separate measurement and payment for supply and installation of Separation/Reinforcement Geotextile Fabric. All Work shall be considered incidental to this specification

E19.5 There will be no separate measurement and payment for compaction. All Work shall be considered incidental to this specification

E19.6 All costs in connection with the testing and approval of base courses shall be considered incidental to this specification

E19.7 Method of Measurement/Basis of Payment

E19.7.1 The Contractor is advised that all Work under this section is incidental to the unit prices bid in those items for which base course material is required under this contract.

E20. JOINT DETAILS

E20.1 The Contractor shall ensure that the joint spacing for concrete pavement Works under this Contract are in accordance with the latest revision Standard Drawings SD-218A, SD-218B, SD-219, SD-220A, SD-220B, SD-220C.

E20.2 All costs associated with this item of Work are incidental.

E21. ASPHALT PAVEMENT

E21.1 Description

E21.1.1 Further to CW 3410 and CW 3110 the Work of this section comprises the furnishing of all labour, equipment and materials incidental and required to complete the construction of asphalt paving as shown on the drawings and as hereinafter specified, including but not necessarily confined to:

- (a) Construction of Heavy Duty Asphalt Paving, including supply and installation of base courses, and asphalt paving as shown on the Drawings.

E21.2 Construction Methods

E21.2.1 Excavation and Compaction of Sub-Grade

- (a) As per E16. Cost of excavation and compaction shall be incidental.

E21.2.2 Base Course and Sub-base

- (a) Contractor shall construct a compacted granular base and sub-base for asphalt pavement to depths as shown on the Drawings, in accordance with City of Winnipeg Specification CW 3110 and as directed by Geotechnical Engineer. Additional gravel shall be supplied and installed if necessary to attain proper sub-grade elevations. Cost of constructing compacted granular base shall be incidental to cost of "Supply and Install Asphalt Paving".

E21.2.3 Asphalt Surface

- (a) Compacted asphaltic concrete surface shall be constructed as per City of Winnipeg Specification CW 3410 and the Construction Drawings. Contractor to provide mix to meet City of Winnipeg Specifications.

E21.2.4 Field Quality Control

- (a) Inspection and testing of subgrade, base courses, and asphalt will be carried out by designated testing laboratory as directed by the Contract Administrator. The cost of testing to be incidental to the unit prices for "Supply and Install Asphalt Paving".
- (b) Where tests show that the compaction does not meet the specified requirement, the Contractor shall pay the costs for further compaction in a manner dictated by the Geotechnical Report, and shall pay for further testing to establish proof of the specified compaction.

E21.2.5 Acceptance

- (a) Any Work not satisfactory as specified herein and as determined by the Contract Administrator shall be rectified by the Contractor. This process of inspection and correction shall continue until the Contract Administrator is satisfied that the Work is 100% complete and as per the construction drawings and specifications.

E21.3 Method of Measurement

E21.3.1 The following items will be measured on an area basis:

- (a) Supply and Install Heavy Duty Asphalt Paving

The area to be paid for shall be the total number of square metres supplied in accordance with the Specifications and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E21.4 Basis of Payment

E21.4.1 The following items will be paid for at the contract unit price per square metre for

- (a) Supply and Install Heavy Duty Asphalt Paving

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.

E22. CONCRETE FORMWORK

E22.1 General

E22.1.1 Related Work

- (a) E23 Concrete Reinforcement and E24 Cast-in-Place Concrete.

E22.1.2 Reference Standards

- (a) All concrete formwork is to be done in accordance with CAN/CSA-A23. 1-M90 and CAN/CSA-A23.2-M90, except where specified otherwise.

E22.1.3 Shop Drawings

- (a) Submit Engineered stamped shop drawings for review and approval by Contract Administrator prior to manufacture.
- (b) Indicate method and schedule of construction, materials, arrangement of joints, ties, shores, liners, and locations or temporary embedded parts.

E22.2 Materials

E22.2.1 Formwork lumber: plywood and wood formwork materials conform to SAN3-086-M84.

E22.2.2 Form ties: removal or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25mm dia in concrete surface.

E22.2.3 Form liner:

- (a) Plywood: Douglas Fir to CSA 0121-M1978, concrete form grade, square edge, 19mm thick.

E22.2.4 Formwork release agent: chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing concrete from sticking to forms.

E22.3 Construction Methods

E22.3.1 Erection

- (a) Verify lines, levels and dimensions before proceeding with formwork and ensure dimensions agree with drawings.
- (b) Obtain Contract Administrator's approval for use of earth forms.
- (c) Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- (d) Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1-M90.
- (e) Align form joints and make watertight. Keep form joints to minimum.
- (f) Clean formwork in accordance with CAN/CSA-A23, 1-M90. Only permitted if in good condition.

E22.4 Method of Measurement

E22.4.1 No measurement will be made for concrete formwork.

E22.5 Basis of Payment

E22.5.1 No payment shall be made for concrete formwork. Include concrete formwork costs in those items for which concrete formwork is required.

E23. CONCRETE REINFORCEMENT

E23.1 General

E23.1.1 Related Work

- (a) E21 Concrete Formwork and E23 Cast in Place Concrete.

E23.1.2 Reference Standards

- (a) Perform concrete reinforcing Work in accordance with CAN/CSA-A23.3-M94 and welding of reinforcing with CSA W186-M1981, except where specified otherwise.

E23.1.3 Source Quality Control

- (a) Upon request provide Contract Administrator with certified copy of mill test report of reinforcing steel showing physical and chemical analysis, minimum 5 weeks prior to commencing reinforcing Work.
- (b) Inform Contract Administrator of proposed source of material to be supplied.

E23.1.4 Shop Drawings

- (a) Submit engineered stamped shop drawings for review and approval by Contract Administrator prior to manufacture.
- (b) Shop drawings consist of bar bending details, list and placing drawings.
- (c) On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and mechanical splices, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacing and location of chairs, spacers and hangers.
- (d) Design and detail lap lengths and bar development lengths to conform to CAN3-A23.3-M84.

E23.1.5 Substitutions

- (a) Substitution of different size bars permitted only upon written approval of Contract Administrator. Substitutions must be in writing and shown on shop drawings that have been approved and stamped by Engineer.

E23.2 Materials

E23.2.1 Reinforcing steel: billet steel, grade 400, deformed bars to CSA G30.12-M1977 unless indicated otherwise.

E23.2.2 Cold-drawn annealed steel wire ties: to CSA G30.3-M1983.

E23.2.3 Chairs, bolsters, bar supports, spacers: to CAN/S|CSA-A23.1-M94.

E23.2.4 Mechanical splices: subject to approval of Contract Administrator. All reinforcing steel in grade beams, piles, slabs and planter walls must be epoxy coated.

E23.3 Fabrication

E23.3.1 Fabricate reinforcing in accordance with CAN/CSA-A23.1-M94

E23.3.2 Obtain Contract Administrator's approval for locations of reinforcement splices other than shown on placing drawings.

E23.3.3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

E23.4 Construction Methods

E23.4.1 Field Bending

- (a) Do not field bend reinforcement except where indicated or authorized by Contract Administrator.
- (b) When field bending is authorized, bend without heat, apply a slow and steady pressure.
- (c) Replace bars which develop cracks or splits.

E23.4.2 Placing Reinforcement

- (a) Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA-A23.1-M94.
- (b) Located reinforcing splices not indicated on drawings at points of minimum stress.
- (c) Ensure clear cover as indicated on drawings.

- (d) Cover to reinforcing: beams 40mm, underside of footings 75mm, and walls 40mm.
- (e) Prior to placing concrete, obtain Contract Administrator's approval of reinforcing steel and position.

E23.4.3 Cleaning

- (a) Maintain all reinforcement clean and free from oil and other deleterious materials.

E23.5 Method of Measurement

- E23.5.1 No measurement shall be made for supply and placing of concrete reinforcement.

E23.6 Basis of Payment

- E23.6.1 No payment shall be made for concrete reinforcement. Include costs in items of concrete Work for which reinforcement is required.

E24. CAST IN PLACE CONCRETE

E24.1 General

- E24.1.1 The "General Conditions and Supplemental Conditions" of this Specification and all documents listed in the Bid Opportunity shall apply to and govern all phases of the Work hereinafter specified and/or shown on the Drawings.

E24.1.2 Scope of Work

- (a) The Work of this section comprises the furnishing of all labour, equipment and materials required to complete the supply and installation of all cast-in-place concrete including but not limited to Concrete Curbs, Concrete Curb and Gutter, and Landscape Curb as shown on the Drawings and as hereinafter specified, including, but not necessarily confined to the following:
 - (i) Excavation including disposal of excess material.
 - (ii) Subgrade Compaction as required.
 - (iii) Compacted Granular fill Work as required.
 - (iv) Supply, erection and removal of all formwork as required.
 - (v) Design of concrete mixes.
 - (vi) Supply, placing and curing of all Landscape Curbs.
 - (vii) Surface preparation and waterproofing of concrete Works.
 - (viii) Cleanup.

E24.1.3 Samples

- (a) At least 1 week prior to commencing Work, inform Contract Administrator of proposed source of aggregates and provide access for sampling.

E24.1.4 Certificates

- (a) Minimum 1 week prior to starting concrete Work submit (if requested) to Contract Administrator manufacturer's test data and certification by qualified independent inspection and testing laboratory that the following materials will meet specified requirements:
 - (i) Portland cement.
 - (ii) Cement slurry bonding agent.
 - (iii) Admixtures.
 - (iv) Aggregates.
 - (v) Water.
 - (vi) Waterproofing
 - (vii) Emulsified asphalt.
 - (viii) Epoxy grout.

- (b) Provide certification that plant, equipment, and materials to be used in concrete complies with requirements of CAN/CSA-A23.1-M90 and that mix design is adjusted to prevent alkali aggregate reactivity problems.
- (c) Provide certification that mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CAN/CSA-A23.1-M90 and that mix design is adjusted to prevent alkali aggregate reactivity problems.

E24.1.5 Construction Quality Control and Placement Procedures.

- (a) Submit proposed quality control procedures for Contract Administrator's approval.
- (b) Submit proposed concrete placement procedures for Contract Administrator's approval.

E24.2 Materials

E24.2.1 Portland cement to CAN3-A5-M1983.

E24.2.2 Water to CAN/CSA-A23.1-M90.

E24.2.3 Aggregates to CAN/CSA-A23.1-M90. Coarse aggregates to be normal density.

E24.2.4 Chemical admixtures to CAN3-A266.2-M78. Contract Administrator to approve accelerating or set retarding admixtures during cold and hot weather placing. Use of calcium chloride is not permitted.

E24.2.5 Curing and sealing compound to: CAN/CSA-A23.1-M90, CPD Acrylic cure and seal or equal and to ASTM C309-81, Type 1 - chlorinated rubber.

E24.2.6 Premoulded joint fillers:

- (a) Bituminous impregnated fibre board: to ASTM D1751-83.

E24.2.7 Concrete Mixes

- (a) All concrete Work shall be in accordance with CSA A23.1 M94-Concrete Materials and methods of concrete construction.
- (b) Proportion normal density concrete in accordance with CSA A23.1-M94 to give the following properties:
- (c) Concrete for Landscape Curbs
 - (i) Cement: Type 10
 - (ii) Maximum Coarse Aggregate: 20mm
 - (iii) Minimum Compressive Strength at 28 days: 32Mpa
 - (iv) Minimum Cement Content: 340 / kg/ cu.m
 - (v) Maximum Water/ Cement Ratio: 0.45
 - (vi) Class of Exposure: C-2
 - (vii) Maximum Slump: 80mm
 - (viii) Air Content: 6-8%
- (d) Concrete for cast-in-place pile as follows:
 - (i) Cement: Type 50
 - (ii) Max. Coarse Aggregate: 20mm
 - (iii) Min Compressive Strength at 28 days = 35 MPa
 - (iv) Min. Cement Content: 325 kg/cu.m
 - (v) Max. Water Cement Ratio: 0.45
 - (vi) Class of Exposure: S-2
 - (vii) Slump: 60mm-100mm
 - (viii) Air Content: 4 to 7%
 - (ix) Flyash content: Max 15% of Cementitious Material

- (x) Air entraining admixture
- (e) Do not change concrete mix without prior approval of Contract Administrator.

E24.3 Construction Methods

E24.3.1 Workmanship

- (a) Do all concrete Work in accordance with CAN/CSA-A23.1-M90. All testing of concrete shall be done in accordance with CAN/CSA-A23.2-M90. Obtain Contract Administrator's approval before placing concrete. Provide 3 days notice prior to placing of concrete.
- (b) Pumping of concrete is permitted only after approval of equipment and mix.
- (c) Ensure reinforcement and inserts are not disturbed during concrete placement.
- (d) Do not place load upon new concrete until authorized by Contract Administrator as per City of Winnipeg Standards.

E24.3.2 Construction Joints

- (a) Joint Fillers
 - (i) Furnish filler for each joint in a single piece for depth and width required for joint, unless otherwise authorized by Contract Administrator. When more than one piece is required for a joint, fasten abutting ends and hold securely by stapling or other positive fastening.

E24.3.3 Finishing of Concrete

- (a) General
 - (i) Finish concrete in accordance with CAN/CSA/A23.1-M90. Float surface with metal float and bring surface to true grade.
- (b) Landscape Curb and Exposed Foundations
 - (i) All shall be finished by a specialty concrete finishing subcontractor.
 - (ii) The size of finishing crews shall be planned with due regard for the effects of concrete temperatures and atmospheric conditions of the rate of hardening of the concrete.
 - (iii) The elevation of the finished shelter slab shall not vary more than 4mm +/- from the design elevation.
 - (iv) Finish of all items shall be smooth and clean with no pits, chips, bumps or other surface imperfections.

E24.3.4 Cleanup and Damage

- (a) Immediately on completion of concrete Work the Contractor shall remove from Site all equipment, timbers, shores, excavated materials, unused concrete, rubbish etc. caused by his operations, and leave the Site clean, level and ready for other Works.
- (b) The Contractor shall be responsible for making good all areas damaged by his operations in connection with this Contract regardless of the limits of the Contract as shown on the Drawings.

E24.4 Method of Measurement

E24.4.1 Cast-in-place Concrete will be measured on a unit basis as follows:

- (a) Supply and install cast in place concrete pile

The units to be paid for shall be the total number of units installed in accordance with this Specification and acceptable to the Contract Administrator, as computed from measurements made by the Contract Administrator.

E24.4.2 Cast-in-place Concrete will be measured on a linear metre basis as follows:

- (a) Supply and install cast in place concrete curb

- (b) Supply and install cast in place concrete curb and gutter
- (c) Supply and install 300mm ht. – 300mm wide cast in place concrete landscape curb

The length to be paid for shall be the total number of linear metres installed in accordance with this Specification and acceptable to the Contract Administrator, as computed from measurements made by the Contract Administrator.

E24.5 Basis of Payment

E24.5.1 Cast in place concrete piles will be paid for at the contract unit price per unit for “Supply and install cast in place concrete pile”, 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.

E24.5.2 The following items will be paid for at the contract unit price per lineal metre for:

- (a) Supply and install cast in place concrete curb
- (b) Supply and install cast in place concrete curb and gutter
- (c) Supply and install 300mm ht. – 300mm wide cast in place concrete landscape curb as 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.

E25. CONCRETE COLLARS

E25.1 The Contractor shall construct a square, rectangular or circular concrete collar around all poles, valves, hydrants, manholes, lights, and other appurtenances within areas of unit paving as directed by the Contract Administrator and as shown on the drawings.

E25.2 The collar shall be 225 mm thick concrete pavement in accordance with CW-3325. The overall outside dimension of the collar shall generally be 300 mm larger than the diameter of the structure being surrounded or as indicated on details and directed by the Contract Administrator. The purpose of the collar is to provide a uniform edge for the installation of paving stones.

E25.3 No direct payment will be made for construction of concrete collars as they shall be considered incidental to concrete sidewalk and unit paving stone installation.

E26. ASPHALT PATHWAY

E26.1 Description

E26.1.1 Further to CW 3410 and CW 3110 the Work of this section comprises the furnishing of all labour, equipment and materials incidental and required to complete the construction of asphalt pathway as shown on the drawings and as hereinafter specified, including but not necessarily confined to:

- (a) Construction of Asphalt Pathway, including supply and installation of base courses, and asphalt paving as shown on the Drawings.

E26.2 Materials

- (a) Subbase as per CW 3110.
- (b) Base course as per CW 3110
- (c) Asphalt as per CW 3410

E26.3 Construction Methods

Base Course and Subbase

- E26.3.1 Contractor shall construct a compacted gravel base for asphalt pavement to depths as shown on the Construction Drawings in accordance with City of Winnipeg Specification CW 3110. Additional gravel shall be supplied and installed if necessary to attain proper subgrade elevations. Cost of constructing compacted gravel base shall be incidental to cost of 'Asphalt Pathway'

Asphalt Surface

- E26.3.2 Compacted asphaltic concrete surface shall be constructed in accordance with City of Winnipeg Specification CW 3410 and the Construction Drawings.

E26.4 Acceptance

- E26.4.1 Any Work not satisfactory as specified herein and as determined by the Contract Administrator shall be rectified by the Contractor. This process of inspection and correction shall continue until the Contract Administrator is satisfied that the Work is 100% complete and as per the construction drawings and specifications.

E26.5 Method of Measurement

- E26.5.1 Asphalt Pathway shall be measured on an area basis. The area to be paid for shall be the total number of square metres placed in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.

E26.6 Basis of Payment

- E26.6.1 Asphalt Pathway will be paid for at the contract unit price per square metre for Supply and Install Asphalt Pathway 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.

E27. LINE PAINTING

E27.1 General

- E27.1.1 This specification is to cover all labour, equipment and materials required to mark pathway traffic lines on the asphalt/concrete surface. The painting of certain vehicular traffic hazards/obstructions are illustrated on the attached drawings.

E27.2 Materials

- E27.2.1 Paint shall conform to City of Winnipeg specification for reflectorized traffic paint or suitable equivalent for application to asphalt and/or concrete surface.

- (a) CGSB 1-GP-74M + Amdt-May-81, alkyd traffic paint
- (b) High Gloss Traffic Paint (IBIS Products Limited)

- E27.2.2 Paint colours shall be:

- E27.2.3 Yellow - all centre lines, parking stall lines and handicap symbols illustrated on plan. White – stop bars.

- (a) CGSB 1-GP-12C + Amdt-Dec-84, yellow 505-30, white 513-3018 (MTO Spec. 1710);(Yellow 40-3057, White 40-2478 -IBIS Products Limited)
- (b) Federal Traffic Paint, Yellow 40-3597 Qual No 80087, White 40-3596 Qual No 80086 (IBIS Products Limited)
- (c) High Gloss Traffic Paint, Yellow 40-1821 (IBIS Products Limited)

- E27.2.4 Thinner to CGSB 1-GP-5M

- E27.2.5 Glass Beads: Overlay Type: To CGSB 1-GP-74 ÷ Amdt-May-81

E27.3 Construction Method

- E27.3.1 Line painting to be done upon completion of asphalt paving Work and curing time.
- E27.3.2 No markings shall be performed when the temperature is below 10⁰ Celsius nor during rainfall or fog, or until the surface is perfectly dry. No markings shall be done if, in the opinion of the site supervisor, the conditions are not conducive to provide a top quality result.
- E27.3.3 Immediately before application of the paint, the existing surface shall be dry and entirely free from dirt, grease, oil acids, laitance, or other foreign matter which would reduce the bond between the coat of paint and the asphalt/concrete. The surface shall be thoroughly cleaned by sweeping and blowing as required to remove all dirt, laitance and loose materials.
- E27.3.4 Suitable chalkline layouts of proposed lines and arcs shall be spotted in advance of the paint application. Control points shall be spaced at such intervals as will ensure accurate location of all markings.
- E27.3.5 When discrepancies between the drawings and the field layout occur, these discrepancies are to be reported to the Contract Administrator for further action before proceeding with the application of paint.
- E27.3.6 The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimension, and application of the paint.
- E27.3.7 Markings shall be applied at the locations and to the dimensions and spacing indicated on the plans or as specified. Paint shall not be applied until the layouts, indicated alignment and the condition of the existing surface have been approved by the site engineer and/or site supervisor.
- E27.3.8 Paint shall be applied at a rate of 200 lineal feet per gallon (60m per 4.5L) and maintain a uniform lines unless otherwise indicated on specifications drawings.
- E27.3.9 Apply glass beads at a rate of 70g/L of paint.
- E27.3.10 The paint shall be mixed in accordance with the manufacturer's instructions before application. The paint shall be thoroughly mixed and applied to the surface of the concrete with the marking machine. The surface shall receive two (2) coats, the first coat shall be thoroughly dry before the second coat is applied.
- E27.3.11 The paint applicator to be an approved pressure type mobile distributor capable of applying paint in single or double and dashed lines, and that will ensure uniform application and having a positive shut-off.
- E27.3.12 In the application of straight strips, any deviation in the edges exceeding 1/2 inch in 50 feet shall be obliterated and the marking corrected. The width of the markings shall be as designated within a tolerance of 5 percent. All paintings shall be performed to the satisfaction of the Contract Administrator by competent and experienced equipment operators, labourers, and artisans in a neat and Workmanlike manner.
- E27.3.13 Thoroughly clean distribution tank before refilling with paint of different colour.
- E27.3.14 After application of the paint, all markings shall be protected while the paint is drying. The fresh paint shall be protected from injury or damage of any kind. The Contractor shall be directly responsible and shall erect or place suitable warning signs, flags, or barricades, protective screens, or coverings as required. All surfaces shall be protected from disfiguration by spatter, splashes, spillage drippings, of paint or other materials.
- E27.4 Method of Measurement
- E27.4.1 Supply and install line painting will be measured on a lump sum basis. The lump sum to be paid for shall be for all Work and materials supplied in accordance with the specifications and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.
- E27.5 Basis of Payment

E27.5.1 Supply and install line painting will be paid for at the contract lump sum price for "Line Painting", measured as specified herein, which price shall be payment in full for supplying all materials as required and performing all operations herein described and all other items incidental to the Work included in this specification.

E28. UNIT PAVING STONE

E28.1 Description

E28.1.1 This Specification shall cover the supply and installation of Unit Paving Stones and Brick Pavers and installation of stockpiled unit paving stones and brick pavers.

(a) Unit Paving Stones in block outs in Concrete Sidewalk Paving.

E28.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E28.2 General

E28.2.1 Store units in a protected location, immediately upon arrival on the Site.

E28.2.2 Remove from Site any units which have been damaged during transportation and replace.

E28.3 Materials

E28.3.1 Paving Stones on Concrete Sidewalk Base

(a) Paving stones shall be Barkman Precast Concrete Pavers as shown on the Construction Drawings and as follows:

(i) "Holland Stone" Sierra Grey 105 x 210 x 60 mm

(ii) "Holland Stone" Rustic Red 105 x 210 x 60mm

as supplied by:

Barkman Concrete Ltd.
909 Gateway Road
Winnipeg, Manitoba, R3K 3L1
Contact: Wayne Wiebe
T (204) 667-3310

E28.3.2 Grout

(a) Grout as specified hereinafter shall be used for grouting paving stone and brick in areas indicated on the drawings. The grout shall have a compressive strength of 25 MPA at 28 days, determined on 50 mm cubes stored and tested in accordance with ASTM C109, and shall consist of normal portland cement, sand and water.

(b) The water-cement ratio shall be kept in the range of 0.45 to 0.55.

(c) The grout shall have between 3% and 5% entrained air.

(d) Acryl stix or approved equal to be used in grout at approximately 4 litres Acryl stix 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.

E28.3.3 Dry Sand/Cement Mix

- (a) Dry sand/cement mix shall consist of 1 part Portland dry mix to 3 parts sand.

E28.3.4 Bedding Sand

- (a) Bedding sand shall be fine aggregate as specified in Section 5.4.1 of Specification CW 3310, with the exception that the sand shall have a minimum of 30% of the particle larger than 3mm.

E28.3.5 Filler Sand

- (a) Filler sand shall have a maximum aggregate size of 3mm.

E28.4 Construction Methods

E28.4.1 Excavation

- (a) Excavation shall comply with Specification CW 3110.
- (b) The excavation shall not extend beyond the specified limits of excavation. The limits of excavation shall be taken as a vertical plane not more than 150mm beyond the limits of the proposed paving stone and brick sidewalk, unless otherwise specified on the Drawings or in the Specifications for the Work.
- (c) The sub-grade shall be excavated to the minimum depth shown on Detail SD-240B, unless otherwise directed by the Contract Administrator.

E28.4.2 Concrete Sidewalk Base

- (a) The Concrete Sidewalk Base shall be constructed in accordance with Specification CW 3325 and as shown on the drawings.
- (b) No direct payment will be made for construction of concrete sidewalk base as it shall be considered incidental to the unit paving installation.

E28.4.3 Preparation of Sand Base

- (a) On top of the concrete sidewalk base, lean mix concrete base and existing areaways a layer of sand shall be placed, depth as indicated on the details.
- (b) The bedding sand layer shall be spread and levelled so that the brick and paving stones when installed are 5mm higher than the finished grade. No more sand shall be spread than can be covered same day by paving stones and brick. The bedding sand layer shall not be compacted prior to laying the paving stones
- (c) The cost of supplying and placing bedding sand shall be incidental to the installation of the paving stones
- (d) No paving stones shall be placed until construction of the underlying layers has been approved by the Contract Administrator.

E28.4.4 Installation of Paving Stones

- (a) New Paving Stones shall be installed in block out areas on concrete sidewalk
- (b) Contractor to verify the exact dimensions of Interlocking Paving Stones prior to Installation.
 - (i) Install sand bed to depth specified on Drawings.
 - (ii) Do not compact setting bed prior to installation of pavers
 - (iii) Spread only sufficient area which can be covered with pavers same day.
 - (iv) Lay pavers on sand bed hand tight.
 - (v) i) Where paving pattern is interrupted by vertical structural elements set into underlying concrete base and/or proposed or existing concrete foundation pads - pavers must be sawcut and fit true and hand tight.
ii) Vertical Structural Elements are to be set into underlying concrete base and/or concrete slab foundations prior to installation of pavers and brick.
 - (vi) Commence installation of new stones against block-out to obtain straightest possible course for installation.

- (vii) Pavers shall be cut with a saw only, to obtain true even undamaged edges. Chipped pavers are unacceptable.
- (viii) Crews shall Work on installed paving stone, not on sand layer.
- (ix) Spread and fine grade brick sand over paving surface and sweep into joints, in several directions.
- (x) Compact paving stones with vibratory plate compactor having mass of at least 113 kg.
- (xi) Sweep remaining sand over all paving stone areas and remove from Site.
- (xii) Replace at no extra cost all whole or cut stones marked as unacceptable.
- (xiii) Remove cracked, chipped, broken or otherwise damaged paving materials from Site immediately.
- (xiv) Upon completion, clean in accordance with manufacturer's recommendations.
- (xv) Grout in place all paving stones smaller than 2" x 4".
- (xvi) In the area of all sidewalk ramps cut paving stones as required so that they lay flush with no edges extending above finished grade of ramp surface. Ensure that all cuts are made in a logically and aesthetically pleasing manner as approved by Contract Administrator on Site.

E28.5 Method of Measurement

E28.5.1 Supply and Installation of unit pavers on concrete sidewalk base will be measured on a surface area basis. The surface area to be paid for shall be the total number of square metres supplied and installed in accordance with the Drawings and Specifications and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E28.6 Basis of Payment

E28.6.1 The supply and installation of unit pavers on concrete sidewalk base will be paid for at the Contract Unit Price per square metre for "Supply and Install unit pavers on concrete sidewalk base": Measured as specified herein, which price shall be payment in full for supplying and installing all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E29. WOOD BOLLARD

E29.1 Description

E29.1.1 The Work of this section comprises the furnishing of all labour equipment and materials incidental and required to complete the supply and installation of wood bollards as shown on the drawings and hereinafter specified.

E29.2 Installation

E29.2.1 Wood bollards to be installed as per the drawings and City of Winnipeg standards.

E29.3 Method of Measurement

E29.3.1 Wood Bollards shall be measured on a per unit basis. The numbers to be paid shall be the total number of units installed in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator.

E29.4 Basis of Payment

E29.4.1 Supply and install wood bollards will be paid for at the Contract unit price for "Supply and install wood bollards" 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.

E30. STEEL BOLLARD

E30.1 Description

E30.1.1 Work under this section shall include all labour, materials, equipment and services necessary for the supply and installation of concrete filled steel bollards.

E30.2 General Delivery and Storage

E30.2.1 Store units in a protected location immediately upon arrival on the Site.

E30.2.2 Remove and replace any units which have been damaged during transportation.

E30.3 Products

E30.3.1 Concrete Bases specified under Section E23 of this Specification.

E30.3.2 Steel Bollard supplied by:

Henry Avenue Forge
811 Henry Ave.
Winnipeg, Manitoba R3E 1V4
Ph: (204) 775-1771 Fax: (204) 772-0072

E30.4 Materials

E30.4.1 Steel pipe for bollards shall be 200mm diameter Schedule 40 steel pipe, 1210mm long c/w 75mm long, 12.5mm dia. steel bar anchors welded to base of pipe at 90 degree angle.

E30.4.2 Hot-dipped galvanized after fabrication.

E30.4.3 Paint silver after galvanizing process. Use approved paint and primer.

E30.4.4 Reflective tape: Avery Dennison glass-bead reflective sheetings. Series T-1000 Engineering Grade (ASTM D-4956 Type 1 Specifications).

E30.4.5 Water Jet cut steel band – 20 gauge stainless steel, painted silver.

E30.5 Installation

- (a) Bollards shall be installed in locations as indicated on the Construction Drawings.
- (b) Bollards to be installed as per City of Winnipeg Specifications and details.
- (c) Protect and maintain Bollards, including accessories, until acceptance of project Work.
- (d) Immediately remove from Site, damaged furnishing and accessories. Replace, repair, re-finish, or otherwise make good to approval of Contract Administrator.

E30.6 Method of Measurement

E30.6.1 The supply and installation of Steel Bollards will be measured on a unit basis. The number to be paid for will be the total number placed in accordance with this Specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

E30.7 Basis of Payment

E30.7.1 The supply and installation of Steel Bollards will be paid for at the Contract Unit Price for "Supply and install concrete filled steel bollard", which price shall be payment in full for supply of all materials and performing all operations herein described and for all other items incidental to the Work included in this Specification.

E31. SITE FURNITURE

E31.1 Description

E31.1.1 This specification covers the supply and installation of:

- (a) 1.82m length Tache Style Recycled Plastic Timber Bench with Modified Back and Armrest

E31.2 General

- E31.2.1 Store units in a protected location, immediately upon arrival on the Site.
- E31.2.2 Remove from Site any units which have been damaged during transportation and replace.

E31.3 Products

- E31.3.1 Recycled Plastic Benches -1.82m length Tache Style Recycled Plastic Timber Bench with Modified Back and Armrest as supplied by:

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

E31.4 Installation

- (a) Site Furniture shall be installed in locations as indicated on the Construction Drawings.
- (b) Benches to be installed as per the drawings and City of Winnipeg Specifications and details.
- (c) Protect and maintain Site furnishings, including accessories, until acceptance of project Work.
- (d) Immediately remove from Site, damaged furnishing and accessories. Replace, repair, re-finish, or otherwise make good to approval of Contract Administrator.

E31.4.2 Concrete Foundations

- (a) Benches are to be set into CIP Concrete Landscape Curbs. Refer to Section E23 and the drawings.
- (b) No separate payment will be made for concrete foundation for site furniture. All Work is incidental to the unit prices bid for the items.

E31.5 Method of Measurement

- E31.5.1 Supply and Installation of Site furniture will be measured on a unit basis. The number of each item to be paid for will be the total number supplied and placed in accordance with this Specification and accepted by the Contract Administrator, as measured by the Contract Administrator.

E31.6 Basis of Payment

- E31.6.1 Supply and Installation of 1.82m length Tache Style Recycled Plastic Timber Bench with Modified Back and Armrest shall be at the per unit price bid for each item for "Supply and install 1.82m length Tache style recycled plastic timber bench with modified back and armrest" measured as specified herein, which price shall be payment in full for supplying all materials and performing all operations herein described and all other items incidental to the Work included in this Specification.

E32. ROOT BARRIER

E32.1 Description

- E32.1.1 Work under this section shall include all labour, materials, equipment and services necessary for the supply and installation of Tree Root Barriers

E32.2 General Delivery and Storage

- E32.2.1 Store units in a protected location immediately upon arrival on the Site.
- E32.2.2 Remove and replace any units which have been damaged during transportation.

E32.3 Products

- E32.3.1 Root Barrier supplied by:

Nilex Inc.
 81 Lawson Crescent
 Winnipeg, Manitoba R3P 0T3
 Ph: (204) 925-4466 Fax: (204) 775-9286
 Contact: Ian Corne

- E32.3.2 Products of manufacturers meeting indicated standards and specified manufacturer's product data characteristics, are acceptable for use, subject to approval of product list and samples.

E32.4 Materials

- E32.4.1 Product standard of quality: DeepRoot; Tree Root Barriers; UB 18-2.
- E32.4.2 Material: 0.080" wall thickness, nominal, nominal, injection molded 50% post-consumer recycled polypropylene panels with UV inhibitors.
- E32.4.3 Panel specifics:
 - (a) 7/16" wide integral molded 2.03mm thickness double top edge with stiffening ribs; bottom edge attached to vertical root deflecting ribs.
 - (b) Integral molded 0.080" thickness by 2" deep vertical root directing ribs spaced at 6" O.C.
 - (c) Integral molded 0.080" thickness by 2" long by 3/8" wide horizontal anti-lift ground lock tabs; minimum nine per panel.
- E32.4.4 Size: 24" wide by 18" deep.
- E32.4.5 Integrated zipper joining system for panel connection to adjacent panel.
- E32.4.6 Color: Black.
- E32.4.7 The basic properties of the material shall be:

TEST	ASTM TEST METHOD	TYP. VALUE COPOLYMER POLYPROPYLENE
Tensile Strength @ yield - wall	D-638	2,383 PSI
Tensile Strength @ yield - Hinge	D-638	2,483 PSI
Yield Elongation - Wall	D-638	7.71%
Yield Elongation - Hinge	D-638	7.58%
Flexural Modulus	D-790B	120.785 PSI
Notched Izod Impact – Wall	D-256A	2.54 (ft-lbs)
Rockwell Hardness r. scale - Wall	D-785A	84.1

E32.5 Installation

- (a) The contractor shall install the tree root barriers with the number of panels and in the manner shown on the Drawings. The vertical root deflecting ribs shall be facing inwards to the root ball and the top of the double edge shall be 12.7mm above grade. Each of the required number of panels shall be connected to form a circle around the root ball or joined in a linear fashion and placed along the adjacent hardscape.

(b) Excavation and soil preparation shall conform to section E14 and the Drawings

E32.6 Method of Measurement

E32.6.1 The supply and installation of Root Barrier will be measured on a lineal metre basis. The length to be paid for will be the total lineal metres placed in accordance with this Specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

E32.7 Basis of Payment

E32.7.1 The supply and installation of Root Barrier will be paid for at the Contract Unit Price for "Supply and install Root Barrier", 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.

E33. PREPARATION OF PLANTING BEDS

E33.1 Description

E33.1.1 Scope of Work

(a) The following generally describes the scope of this Section:

- (i) Supply and Install minimum 450 mm planting soil mixture in planting beds. Excavate and dispose of existing unsuitable soil/granular base as required.

E33.1.2 Samples

(a) Submit to the Contract Administrator samples of the following materials:

- (i) Planting Soil Mixture: 1 kg.

E33.1.3 Delivery and Storage

(a) Deliver and store fertilizer in waterproof bags showing weight, analysis and name of manufacturer.

E33.2 Materials

E33.2.1 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. Topsoil to contain no residual soil incorporated herbicides.

E33.2.2 Peat moss: 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 5.0 to 6.5, 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.

E33.2.3 Sand: hard, granular natural beach sand, washed free of impurities, chemical or organic matter.

E33.2.4 Fertilizer: commercial type with 50% of the elements derived from organic sources.

E33.2.5 Bonemeal: shall be raw bonemeal, finely ground with a minimum analysis of 3% nitrogen and 20% phosphoric acid.

E33.2.6 Soil Mixture for Planting

(a) Planting soil mix shall consist of 1/3 topsoil, 1/3 peat moss and 1/3 sand. While mixing, adjust Ph by addition of finely ground dolomite limestone to 6.2 to 6.8. Add 3.0 lbs. of 0-20-0 super phosphate 1.8 kg/m³. Add the following as required:

- (i) Potash
- (ii) NPK plus minor elements

(iii) PAR-EX complete nutrient fertilizer/CIL slow release

E33.3 Construction Methods

E33.3.1 Excavation of Planting Beds and Planters

- (a) The Contractor must ensure that the extent of all buried utilities and services are located and if necessary, protected, prior to any excavation.
- (b) Excavate the planting beds by hand to the dimensions and depths shown on the Drawings.
- (c) All excavation is incidental and shall be included in the unit price bid for Supply and Installation of Planting Soil Mix.

E33.3.2 Preparation of Planting Beds

- (a) Install planting soil mixture to depth shown on the Drawings.

E33.4 Method of Measurement

E33.4.1 Planting bed preparation will be measured on an area basis. The area to be paid for will be the total square metres placed in accordance with this Specification and accepted by the Contract Administrator, as computed by the Contract Administrator.

E33.5 Basis of Payment

E33.5.1 Payment for "Planting bed preparation" will be made at the Contract Unit Price per square metre 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 in this Specification.

E34. SODDING

E34.1 This specification is supplemental to City of Winnipeg Specification CW3510 and shall cover the supply and installation of sod.

E34.2 Method of Measurement

E34.2.1 Supply, placement and maintenance of sod will be measured on an area basis. The area to be paid for shall be the total number of square metres placed and maintained in accordance with this Specification and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E34.3 Basis of Payment

E34.3.1 Supply, placement and maintenance of sod will be paid for at the Contract Unit Price per square metre for 'Supply and install topsoil and sod', measured as specified herein, which price shall be payment in full for completing all operations herein described and all other items incidental to the Work included in this Specification.