



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 100-2006

WATERFRONT DRIVE STREETSCAPING

TABLE OF CONTENTS

PART A - BID SUBMISSION

Form A: Bid	1
Form B: Prices	4
Form G1: Bid Bond and Agreement to Bond	10
Form G2: Irrevocable Standby Letter of Credit and Undertaking	12

PART B - BIDDING PROCEDURES

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

PART C - GENERAL CONDITIONS

C1. General Conditions	1
------------------------	---

PART D - SUPPLEMENTAL CONDITIONS

General

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

Submissions

D7. Safe Work Plan	3
D8. Insurance	3
D9. Performance Security	4
D10. Subcontractor List	4
D11. Detailed Work Schedule	4

Schedule of Work

D12. Commencement	4
D13. Restricted Work Hours	5
D14. Work by Others	5
D15. Sequence of Work	5
D16. Substantial Performance	6
D17. Total Performance	6
D18. Liquidated Damages	6

Control of Work

D19. Job Meetings	6
-------------------	---

Template Version: C120050301

D20. Prime Contractor – The Workplace Safety and Health Act (Manitoba)	7
Warranty	
D21. Warranty	7
Form H1: Performance Bond	8
Form H2: Irrevocable Standby Letter of Credit	10
Form J: Subcontractor List	12

PART E - SPECIFICATIONS

General

E1. Applicable Specifications, Standard Details and Drawings	1
--	---

General Requirements

E2. Protection of Survey Infrastructure	1
E3. Pedestrian Safety and Traffic Management	2
E4. Water Used By Contractor	2
E5. Site Condition	2
E6. Existing Underground Services	3
E7. Construction facilities and staging	3
E8. All-Weather Dump Site	3
E9. Exposing Existing Underground Services and Utilities	3
E10. Layout of Works	4
E11. Private Sidewalks, Side Street Sidewalks	4
E12. Matching Existing Grades	4
E13. Existing Curb Stop Boxes	4
E14. Sawcutting Pavement	5
E15. Clearing and Grubbing	5
E16. Base Course Material	5
E17. Joint Details	6
E18. Sign Support Clamps	6
E19. Removal of Existing unit Paving Stone	6
E20. Removal of Existing Limestone Flagstone	7
E21. Concrete Formwork	8
E22. Concrete Reinforcement	9
E23. Cast in Place Concrete	10
E24. Cast-in-Place Concrete Light Standard Base	13
E25. Concrete Collars	17
E26. Concrete Approach	17
E27. Reinforced Concrete Pavement	18
E28. Catch Basin	18
E29. Fire Hydrant	18
E30. Concrete Sidewalk	18
E31. Asphalt Pathway	19
E32. Unit Paving Stone and Brick Pavers	20
E33. Fencing	24
E34. Steel Bollard	26
E35. Site Furniture	27
E36. Limestone Flagstone	28
E37. Plant Material	28
E38. Preparation of Planting Beds	33
E39. Extended Maintenance of Trees and Plant Material	35
E40. Asphalt Pavement	37
E41. Corrugated Metal Pipe	37

PART B - BIDDING PROCEDURES

B1. PROJECT TITLE

B1.1 WATERFRONT DRIVE STREETSCAPING

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, March 17, 2006.

B2.2 Bid Submissions 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 GC:3.1, 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 shortly before submitting his Bid.

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 shall 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 SUBMISSION

B7.1 The Bid Submission consists 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 All components of the Bid Submission 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 in ink, to constitute a responsive Bid.

B7.3 The Bid Submission shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.

B7.3.1 Samples or other components of the Bid Submission 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 Submission.

B7.4 Bid Submissions submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B7.5 Bid Submissions 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 shall be original and shall 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 Submission 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;
 - (b) be responsible and not be suspended, debarred or in default of any obligation to the City;
 - (c) be financially capable of carrying out the terms of the Contract;
 - (d) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract;
 - (e) have successfully carried out Work, similar in nature, scope and value to the Work;
 - (f) employ only Subcontractors who:
 - (i) are responsible and not suspended, debarred or in default of any obligation 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>); and
 - (ii) have successfully carried out Work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, and are fully capable of

performing the Work required to be done in accordance with the terms of the Contract;

- (g) have a written workplace safety and health program in accordance with The Workplace Safety and Health Act (Manitoba);

B10.2 Further to B10.1(g), 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 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 - Option 1 administered by the Manitoba Heavy Construction Association's Safety, Health and Environment Program; or
- (b) a valid COR certification number under the Certificate of Recognition (COR) Program administered by the Manitoba Construction Safety Association; or
- (c) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Branch internet site at <http://www.winnipeg.ca/matmgt>.)

B10.3 The Bidder shall be prepared to 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.

B10.4 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.

B11.2 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 Bid Submissions 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 Bid Submissions 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 After the public opening, the names of the Bidders and their Total Bid Prices as read out (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 Submission 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 GC:23.3, 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 shall:

- (a) retain the Bid Submission until after the Submission Deadline has elapsed;
- (b) open the Bid Submission 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) 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 Submission 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 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 Submission 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 by way of a letter of intent, or will give notice that no award will be made.

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

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

- (a) the prices exceed the available City funds for the Work;
- (b) the prices are materially in excess of the prices received for similar Work in the past;

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

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

PART C - GENERAL CONDITIONS

C1. GENERAL CONDITIONS

C1.1 The *General Conditions for Construction Contracts* (Revision 2000 11 09) are applicable to the Work of the Contract.

C1.1.1 The *General Conditions for Construction Contracts* 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>.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

- D1.1 In addition to the *General Conditions for Construction Contracts*, these Supplemental Conditions are applicable to the Work of the Contract.
- D1.2 The General Conditions are amended by striking out “The City of Winnipeg Act” wherever it appears in the General Conditions and substituting “The City of Winnipeg Charter”.
- D1.3 The General Conditions are amended by striking out “Tender Package” wherever it appears in the General Conditions and substituting “Bid Opportunity”.
- D1.4 The General Conditions are amended by striking out “Tender Submission” wherever it appears in the General Conditions and substituting “Bid Submission”.
- D1.5 The General Conditions are amended by deleting GC:6.16 and GC:6.17. The City of Winnipeg is now within the jurisdiction of the Manitoba Ombudsman pursuant to The Ombudsman Act.

D2. SCOPE OF WORK

- D2.1 The Work to be done under the Contract shall consist of :
- (a) Pavement Construction
 - (b) Streetscaping of Waterfront Drive (Westside) from McDermot Avenue to James Avenue.
 - (c) Site Services
- D2.2 The major components of the Work are as follows:
- (a) Pavement Construction
 - (i) Excavation and Removals
 - (ii) Supply and Install Base Course Material
 - (iii) Supply and Install Concrete Approach
 - (iv) Supply and Install 200mm Concrete Pavement
 - (v) Supply and Install Light Duty Asphalt Paving
 - (vi) Supply and Install Heavy Duty Asphalt Paving
 - (vii) Supply and Install Heavy Duty Unit Paving
 - (viii) Supply and Install Concrete Curbs, Curb and Gutter
 - (b) Site Services
 - (i) Supply and Install Curb and Gutter Inlet (including 250 CB lead, manhole frame and cover)
 - (ii) Install Relocated Fire Hydrant (including coring, 150 hydrant lead, valve box, connection to water main)
 - (c) Streetscaping
 - (i) Excavation and Removals
 - (ii) Supply and Install Concrete Landscape Curb
 - (iii) Supply and Install Concrete Sidewalk
 - (iv) Supply and Install Asphalt Pathway
 - (v) Supply and Install Unit Paving

- (vi) Supply and Install Bark Nugget Mulch Bed
- (vii) Supply and Install Planting Bed
- (viii) Supply and Install Plant Material
- (ix) Supply and Install Limestone Flagstone Paving
- (x) Supply and Install Sod
- (xi) Supply and Install Concrete Light Bases
- (xii) Supply and Install Gate Structure Fencing and Planter
- (xiii) Supply and Install Removable Fence Post Sleeve and Compression Cap
- (xiv) Supply and Install Waterfront Drive Style Bench
- (xv) Supply and Install Removable Steel Bollard
- (xvi) Supply and Install Waterfront Drive Style Bollard
- (xvii) Supply and Install Concrete Filled Steel Bollard

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is:

Aaron Hirota, B.Env.D., M.L.Arch.
McGowan Russell Group
200-120 Fort Street
Winnipeg, MB, R3C 1C7

Telephone No. (204) 956-0396
Facsimile No. (204) 956-1265

D3.2 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 GC:23.2.2, 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 attention of the Chief Financial Officer at the following address or facsimile number:

The City of Winnipeg
Chief Administrative Officer Secretariat
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
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. SAFE WORK PLAN

- D7.1 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 GC:4.1 for the return of the executed Contract.
- D7.2 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>.

D8. INSURANCE

- D8.1 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) all inclusive, with The City of Winnipeg being added as an additional insured, with a cross-liability clause, such liability policy to also contain a contractual liability, an unlicensed motor vehicle liability and a products and completed operations endorsement to remain in place at all times during the performance of the Work and throughout the warranty period;
 - (b) automobile liability insurance for owned and non-owned automobiles used for or in connection with the Work in the amount of at least two million dollars (\$2,000,000.00) at all times during the performance of the Work and until the date of Total Performance;
- D8.2 Deductibles shall be borne by the Contractor.
- D8.3 The Contractor shall provide the City Solicitor with a certificate of insurance of each policy, in a form satisfactory to the City Solicitor, 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 GC:4.1 for the return of the executed Contract.

D9. PERFORMANCE SECURITY

- D9.1 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.
- D9.1.1 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.
- D9.2 If the bid security provided in his Bid Submission 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 GC:4.1 for the return of the executed Contract.

D10. SUBCONTRACTOR LIST

- D10.1 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 the General Conditions for the return of the executed Contract.

D11. DETAILED WORK SCHEDULE

- D11.1 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 GC:4.1 for the return of the executed Contract.
- D11.2 The detailed Work schedule shall consist of the following:
- (a) a Gantt chart for the Work based on the C.P.M. schedule
- D11.3 Further to D11.2(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

D12. COMMENCEMENT

- D12.1 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.
- D12.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:

- (i) evidence that the Contractor is 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;
 - (ii) evidence of the workers compensation coverage specified in GC:6.14;
 - (iii) the Safe Work Plan specified in D7;
 - (iv) evidence of the insurance specified in D8;
 - (v) the performance security specified in D9;
- (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.

D12.3 The Contractor shall commence the Work on the Site as soon as weather permits Spring 2006. Start date to be mutually agreed upon by all parties.

D13. RESTRICTED WORK HOURS

D13.1 Further to clause 3.10 of CW 1130, the Contractor shall require written permission 48 hours in advance from the Contract Administrator for any Work to be performed between 2000 hours and 0700 hours, or on Saturdays, Sundays, Statutory Holidays and or Civic Holidays.

D14. WORK BY OTHERS

D14.1 Work by others on or near the Site will include but not necessarily limited to:

- (a) Ship Street Village building construction
- (b) The Excelsior phase 1 building construction
- (c) The Excelsior phase 2 building construction
- (d) The Strand building construction
- (e) Maintenance to Gate Structure by City of Winnipeg Water and Waste Department
- (f) Sewer renewal Work on Bannatyne Avenue by Winnipeg Water and Waste Department
- (g) Relocation of Existing Streetlights by Manitoba Hydro
- (h) Installation of New Stittsville and Laser Cut Stittsville Lights (including conduit, wiring and power requirements) by Manitoba Hydro
- (i) Hydro Work along Ship Street by Manitoba Hydro

D14.2 The Contractor shall coordinate with the identified activities in order to minimize disruptions.

D15. SEQUENCE OF WORK

D15.1 Further to GC 6.1, the sequence of Work shall be as follows:

- (a) Waterfront Drive – McDermot Avenue to Bannatyne Avenue
- (b) Ship Street – McDermot Avenue to Bannatyne Avenue
- (c) Waterfront Drive – Bannatyne Avenue to James Avenue

D15.1.1 The Contractor shall coordinate Work with the Contractors responsible for the building construction along Waterfront Drive in order to minimize disruptions.

D15.1.2 The Contractor shall coordinate with Manitoba Hydro regarding Manitoba Hydro's installation of conduit, wiring, and power requirements for the Stittsville and Laser Cut Stittsville Lights.

D16. SUBSTANTIAL PERFORMANCE

- D16.1 The Contractor shall achieve Substantial Performance within Forty (40) consecutive Working Days of the commencement of the Work as specified in D12.
- D16.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.
- D16.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

D17. TOTAL PERFORMANCE

- D17.1 The Contractor shall achieve Total Performance within Fifty (50) consecutive Working Days of the commencement of the Work as specified in D12.
- D17.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be reinspected.
- D17.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

D18. LIQUIDATED DAMAGES

- D18.1 If the Contractor fails to achieve Substantial Performance in accordance with the Contract by the day fixed herein for Substantial Performance, the Contractor shall pay the City One Thousand Five Hundred dollars (\$1,500.00) per Working Day for each and every Working Day following the day fixed herein for Substantial Performance during which such failure continues.
- D18.2 The amount specified for liquidated damages in D18.1 is based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve Substantial Performance by the day fixed herein for same.
- D18.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

CONTROL OF WORK

D19. JOB MEETINGS

- D19.1 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.

D19.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he deems it necessary.

D20. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D20.1 Further to GC:6.26, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

WARRANTY

D21. WARRANTY

D21.1 Notwithstanding GC:13.2, the warranty period shall begin on the date of Total Performance and shall expire two (2) years thereafter unless extended pursuant to GC:13.2.1 or GC:13.2.2, in which case it shall expire when provided for thereunder.

FORM H1: PERFORMANCE BOND
(See D9)

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. 100-2006

WATERFRONT DRIVE STREETSCAPING

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 D9)

(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. 100-2006

WATERFRONT DRIVE STREETSCAPING

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)

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS

- E1.1 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.1.1 *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>.
- E1.1.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.1.3 Further to GC:2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.2 The following Drawings are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>
L1.1	Ship Street Village Layout Plan
L1.2	Excelsior / Strand Layout Plan
L1.3	Excelsior / Strand Enlargements
L2.1	Ship Street Village Grading Plan
L2.2	Excelsior / Strand Grading Plan
L3.1	Ship Street Village Planting Plan
L4.1	Details
L4.2	Details
SK1	Lamp_Standard_Base_Detail

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. PEDESTRIAN SAFETY AND TRAFFIC MANAGEMENT

- E3.1 Ambulance/Emergency vehicle access must be maintained at all times.
- E3.2 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.

E4. WATER USED BY CONTRACTOR

- E4.1 Notwithstanding CW 1120.3.7:
- E4.1.1 Water for use by the Contractor may be obtained from the City of Winnipeg waterworks system.
- E4.1.2 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.
- E4.1.3 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.
- E4.1.4 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.

E5. SITE CONDITION

- E5.1 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.
- E5.2 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.
- E5.3 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.

E6. EXISTING UNDERGROUND SERVICES

- E6.1 The Contractor's attention is drawn to the existing underground lines or services that may be located in the area of the Work.
- E6.2 The Contractor shall take all necessary precautions when performing the Work to ensure that no damage is done to these existing services.
- E6.3 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.
- E6.4 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.
- E6.5 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.
- E6.6 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.

E7. CONSTRUCTION FACILITIES AND STAGING

- E7.1 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.

E8. ALL-WEATHER DUMP SITE

- E8.1 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.

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 Where the existing hydro duct line is adjacent to tree wells and Heritage Light Pole bases, the edge and top of the duct must be daylighted in the area of exposure through a hydro vac process. This process must be completed by an authorized hydro vac daylighting Contractor (Badger Daylighting 885-0592)
- E9.4 All costs in connection with this item of Work shall be included in the unit price bid for the various bid items.

E10. LAYOUT OF WORKS

- E10.1 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.
- E10.2 The Contractor must provide all necessary survey equipment in good operating conditions.
- E10.3 The Contractor shall supply all materials (painting, stakes, ribbon, markers, etc) and labour necessary for the accurate location and setting out of the Work.
- E10.4 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.
- E10.5 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.

E11. PRIVATE SIDEWALKS, SIDE STREET SIDEWALKS

- E11.1 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.
- E11.2 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.

E12. MATCHING EXISTING GRADES

- E12.1 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.
- E12.2 All costs associated with matching existing grades shall be included in the unit price bid for Supply and Install Concrete Sidewalk Paving.

E13. EXISTING CURB STOP BOXES

- E13.1 During the removal and installation of the concrete sidewalk and interlock paving, the Contractor shall take all necessary precautions when Working in the vicinity of any existing curb stop boxes.
- E13.2 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
- E13.3 Any existing curb boxes requiring final adjustments (horizontal and/or vertical) are incidental.

E13.4 Any curb stop boxes damaged as a result of the Contractor's operation shall be replaced at his own cost.

E14. SAWCUTTING PAVEMENT

E14.1 At the limits of excavation, the Contractor shall sawcut the existing to produce a clean straight edge when excavated.

E14.2 The cost of sawcutting and disposal of any surplus material shall be included in the unit price bid for Excavation and Removals.

E15. CLEARING AND GRUBBING

E15.1 The Contractor is to note that the Clearing and Grubbing is to include the removal of all the individual trees and shrubs shown on the drawings, as well as all the root masses associated with these trees and shrubs.

E15.2 Construction Methods - as per CW 3010

E15.3 Method of Measurement and Basis of Payment

E15.3.1 Clearing and Grubbing will be measured and paid for at the per unit price for "Clear and grub existing shrubs from beds".

E15.4 Method of Measurement

E15.4.1 Clearing and Grubbing 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.

E15.5 Basis of Payment

E15.5.1 Clearing and grubbing 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.

E16. BASE COURSE MATERIAL

E16.1 This Specification shall supplement Standard Construction Specification CW 3110 and CW 3130.

E16.2 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

E16.3 There will be no separate measurement and payment supply and placement of sub-base. All Work shall be considered incidental to the Supply and Placing of Base Course Material.

- E16.4 There will be no separate measurement and payment for supply and installation of Separation/Reinforcement Geotextile Fabric. All Work shall be considered incidental to the Supply and Placing of Base Course Material.
- E16.5 There will be no separate measurement and payment for compaction. All Work shall be considered incidental to the Supply and Placing of Base Course Material.
- E16.6 All costs in connection with the testing and approval of base courses shall be considered incidental to the Supply and Placing of Base Course Material
- E16.7 Method of Measurement
- E16.7.1 Supply and placing base course material will 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 accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.
- E16.8 Basis of Payment
- E16.8.1 Supply and placing base course material will be paid for at the Contract Unit Price per square metre for 'Supply and placing base course material', 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.

E17. JOINT DETAILS

- E17.1 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.
- E17.2 All costs associated with this item of Work are incidental.

E18. SIGN SUPPORT CLAMPS

- E18.1 The Contractor shall install all new sign support clamps at the locations as shown on the Drawings or as directed by the Contract Administrator. The City shall supply all sign support clamps.
- E18.2 All costs in connection with the installation of sign support clamps are incidental

E19. REMOVAL OF EXISTING UNIT PAVING STONE

- E19.1 Description
- E19.1.1 This Specification shall supplement Standard Construction Specification CW 3330 and shall cover all operations related to the removal of existing Unit Paving Stones.
- E19.2 Construction Methods
- E19.2.1 Removal of existing precast concrete unit paving stone for reinstallation shall include removal of paving stones and base courses as required, disposal of unusable paving stone and base course material and stockpiling of paving stones in approved area for future reinstallation.
- E19.2.2 Any existing lean mix concrete base found is to be removed and disposed to City of Winnipeg Standards and is incidental to the Unit Price Bid for "Removal of Interlock Paving Stone for Reinstallation".

E19.2.3 Any existing lean mix concrete base at the limits of the designated area shall be sawcut for the full depth of the pavement prior to the demolition and removal operations. All costs in connection with sawcutting are incidental and shall be included in the unit price bid for "Removal of Interlock Paving Stone for Reinstallation".

E19.2.4 The Contractor shall exercise due caution during the Interlock paving stone removal Works so as to limit vibration. The Contractor shall take all necessary precautions when Working in the vicinity of any existing duct lines, trees, hedges, etc.

E19.3 Method of Measurement

E19.3.1 Removal of existing interlock paving stone will be measured on a surface area basis for "Removal of Interlock Paving Stone for Reinstallation." The area to be paid for shall be the total number of square metres removed and stockpiled in accordance with this Specification and acceptable to the Contract Administrator, as computed from measurements made by the Contract Administrator.

E19.4 Basis of Payment

E19.4.1 Removal of existing interlock paving stone will be paid for at the Contract Unit Price per square metre for "Removal of Interlock Paving Stone for Reinstallation." Measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E20. REMOVAL OF EXISTING LIMESTONE FLAGSTONE

E20.1 Description

E20.1.1 The Work covered under this item shall include all operations related to removal and stockpile of existing limestone flagstone in accordance with this Specification and as shown on the Drawings.

E20.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, etc. necessary for and incidental to satisfactory performance and completion of all Works as hereinafter specified.

E20.2 Construction Methods

E20.2.1 Removal of existing limestone flagstone for reinstallation shall include removal of limestone flagstone, disposal of unusable stone and stockpiling of limestone flagstone in approved area for future reinstallation.

E20.3 Method of Measurement

E20.3.1 Removal of existing limestone flagstone will be measured on a surface area basis for "Removal of Limestone Flagstone for Reinstallation." The area to be paid for shall be the total number of square metres removed and stockpiled in accordance with this Specification and acceptable to the Contract Administrator, as computed from measurements made by the Contract Administrator.

E20.4 Basis of Payment

E20.4.1 Removal of existing limestone flagstone will be paid for at the Contract Unit Price per square metre for "Removal of Limestone Flagstone for Reinstallation." Measured as specified herein, which price shall be payment in full for performing all operations herein described and all other items incidental to the Work included in this Specification.

E21. CONCRETE FORMWORK

E21.1 General

E21.1.1 Related Work

- (a) E22 Concrete Reinforcement and E23 Cast-in-Place Concrete.

E21.1.2 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.

E21.1.3 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.

E21.2 Materials

E21.2.1 Formwork lumber: plywood and wood formwork materials conform to SAN3-086-M84.

E21.2.2 Form ties: removal or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25mm dia in concrete surface.

E21.2.3 Form liner:

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

E21.2.4 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.

E21.3 Construction Methods

E21.3.1 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.

E21.4 Method of Measurement

E21.4.1 No measurement will be made for concrete formwork.

E21.5 Basis of Payment

E21.5.1 No payment shall be made for concrete formwork. Include concrete formwork costs in those items for which concrete formwork is required.

E22. CONCRETE REINFORCEMENT

E22.1 General

E22.1.1 Related Work

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

E22.1.2 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.

E22.1.3 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.

E22.1.4 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.

E22.1.5 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.

E22.2 Materials

E22.2.1 Reinforcing steel: billet steel, grade 400, deformed bars to CSA G30.12-M1977 unless indicated otherwise.

E22.2.2 Cold-drawn annealed steel wire ties: to CSA G30.3-M1983.

E22.2.3 Chairs, bolsters, bar supports, spacers: to CAN/S|CSA-A23.1-M94.

E22.2.4 Mechanical splices: subject to approval of Contract Administrator. All reinforcing steel in grade beams, piles, slabs and planter walls must be epoxy coated.

E22.3 Fabrication

E22.3.1 Fabricate reinforcing in accordance with CAN/CSA-A23.1-M94

E22.3.2 Obtain Contract Administrator's approval for locations of reinforcement splices other than shown on placing drawings.

E22.3.3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

E22.4 Construction Methods

E22.4.1 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.

E22.4.2 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.

E22.4.3 Cleaning

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

E22.5 Method of Measurement

E22.5.1 No measurement shall be made for supply and placing of concrete reinforcement.

E22.6 Basis of Payment

E22.6.1 No payment shall be made for concrete reinforcement. Include costs in items of concrete Work for which reinforcement is required.

E23. CAST IN PLACE CONCRETE

E23.1 General

E23.1.1 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.

E23.1.2 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.

E23.1.3 Samples

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

E23.1.4 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.

E23.1.5 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.

E23.2 Materials

E23.2.1 Portland cement to CAN3-A5-M1983.

E23.2.2 Water to CAN/CSA-A23.1-M90.

E23.2.3 Aggregates to CAN/CSA-A23.1-M90. Coarse aggregates to be normal density.

E23.2.4 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.

E23.2.5 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.

E23.2.6 Premoulded joint fillers:

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

E23.2.7 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) Do not change concrete mix without prior approval of Contract Administrator.

E23.3 Construction Methods

E23.3.1 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.

E23.3.2 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.

E23.3.3 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.

E23.3.4 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.

E23.4 Method of Measurement

E23.4.1 Cast-in-place Concrete will be measured on a unit basis as follows:

- (a) Supply and Install Concrete Foundations for Lights

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.

E23.4.2 Cast-in-place Concrete will be measured on a linear metre basis as follows:

- (a) Supply and Install 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.

E23.5 Basis of Payment

E23.5.1 Concrete Foundations for Lights will be paid for at the contract unit price per unit for "Concrete Foundations for Lights", 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.

E23.5.2 Landscape Curb will be paid for at the contract unit price per linear metre for "C.I.P. Concrete Landscape Curb", 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. CAST-IN-PLACE CONCRETE LIGHT STANDARD BASE

E24.1 Description

E24.1.1 The Work covered under this item shall include all concreting operations related to construction of cast-in-place concrete light standard bases for the Laser Cut Stittsville and Stittsville Light Standards in accordance with this Specification and as shown on the Drawings.

E24.1.2 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, etc. necessary for and incidental to satisfactory performance and completion of all Works as hereinafter specified.

E24.2 General

E24.2.1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.

E24.3 Materials

E24.3.1 Handling and Storage of Materials

- (a) All materials shall be handled and stored in a careful and Workmanlike manner, to the satisfaction of the Contract Administrator. Storage of materials shall be in accordance with CSA Standard CAN3-A23.1, "Storage of Material", except as otherwise specified herein.

E24.3.2 Testing and Approval

- (a) All materials under this Specification shall be subject to inspection and testing by the Contract Administrator or by the Testing laboratory designated by the Contract

Administrator. There shall be no charge to the City for any materials taken by the Contract Administrator for testing purposes.

- (b) All materials shall conform to CSA Standard CAN3-A23.1
- (c) All testing of materials shall conform to CSA Standard CAN3-23.2
- (d) All costs in connection with the testing and approval of concrete bases are incidental and shall be included in the unit price bid for "Supply and Install CIP Concrete Light Standard Base"

E24.4 Cement

E24.4.1 Cement shall be Type 50, Sulphate-Resistant Cement, conforming to the requirements of CSA Standard CAN3-A5

E24.5 Supplementary Cementing Materials

E24.5.1 Use of Pozzolans, or silica fume will not be permitted for use in structural concrete supplied under this specification. Fly Ash is permitted to maximum of 15% of cement content

E24.6 Water to CAN/CSA-A23.1-M90

E24.7 Aggregates to CAN/CSA-A23.1-M90. Coarse aggregates to be normal density.

E24.8 Admixtures

E24.8.1 No admixtures other than air-entraining agent shall be used without written authorization of the Contract Administrator, unless otherwise specified in these Specifications. It shall be the Contractor's responsibility to ensure that any admixtures is compatible with all other constituent materials.

E24.9 Reinforcing Steel

E24.9.1 Reinforcing steel shall be deemed to include all reinforcing bars, tie-bars, and dowels.

E24.9.2 All reinforcing steel to be high strength deformed bars to grade 400MPa (grade 6) deformed Billet Steel Bars. All Bars to conform to CSA G30.12-M1977 / ASTM A615

E24.10 Anchor Bolts, Nuts and Washers

E24.10.1 Anchor bolts, nuts and washers shall be in accordance with ASTM Grade A325 and shall be hot-dip galvanized in accordance with CSA G164 for a minimum net retention of 600 g/m², for the entire length of the anchor bolts. The treaded portion of the anchor bolts shall extend to the concrete surface.

E24.11 Conduit

E24.11.1 The conduit shall be 50mm plastic pipe and shall include all incidentals, including watertight splice connections, where applicable.

E24.12 Concrete Mix Design

E24.12.1 Concrete shall be proportioned in accordance with CAN 3 23.7-77 to meet the following requirements:

- (i) Minimum Compressive Strength at 28 days = 35 MPa
- (ii) Maximum Water/Cement Ratio = 0.45
- (iii) Minimum Cement Content = 340kg/m³
- (iv) Slump = 90mm +/- 13mm
- (v) Aggregate = 19mm nominal

- (vi) Air Content = 6.0 to 8.0 percent
- (vii) Cement = Type 50

E24.12.2 All concrete shall be in accordance with CAN23.1, A23.2 and A23.3-M77 (Latest edition)

E24.13 Equipment

E24.13.1 All equipment shall be of a type approved by the Contract Administrator and shall be kept in good Working order.

E24.14 Construction Methods

E24.14.1 Location and Alignment of Foundations

- (a) Foundations shall be placed in the position shown on the Drawings and as directed by the Contract Administrator in the field.
- (b) Finished foundations shall not deviate from the vertical by more than 1 percent.
- (c) The construction or cast-in-place concrete foundations c/w anchor bolts shall be coordinated with the fabricator of the pole superstructure.

E24.14.2 Buried Utilities

- (a) The Contractor shall exercise extreme caution when constructing the foundations in the vicinity of existing buried utilities. The Contractor shall be responsible for obtaining the exact location of the buried utilities from the appropriate Utility Authority prior to installing the foundations. The Contractor may be required to hand dig to locate street cables, MTS conduits, gas mains, etc., prior to installing the foundations.
- (b) The proposed locations of the pile foundations may be changed by the Contract Administrator if they interfere with the buried utilities.
- (c) The Contractor shall be responsible for all costs that may be incurred for repair/rectification of any damage caused to the existing buried utilities as a result of the Contractor's operations in constructing cast-in-place concrete foundations, as determined by the Contract Administrator.

E24.14.3 Placing Reinforcing Steel

- (a) The Supply and installation of reinforcing steel will be incidental to the Works of this Specification.
- (b) Reinforcing shall be:
 - (i) Place in accordance with the details shown on the Drawings
 - (ii) Rigidly fastened together, and
 - (iii) Lowered in the bore intact before concrete is placed.

E24.14.4 Placing Anchor Bolts

- (a) The supply and installation of anchor bolts will be incidental to the Works of this Specification.
- (b) The anchor bolts shall be aligned with a steel template supplied by the light structure fabricator matching the bolt holes in the sign structure base plate. The setting templates shall be held in place by the top and bottom nuts of the anchor bolts. Extreme care shall be used in this operation.
- (c) Placement of anchor bolts without the steel template will not be permitted.
- (d) The threaded portion of the anchor bolts shall be coated with oil, before the concrete is poured, to minimize the fouling of threads splattered by concrete residue. The portion of anchor bolts projecting from the foundation shall be fully threaded.

E24.14.5 Installation of Conduits

- (a) The supply and installation of plastic conduits will be considered incidental to the Work of this Specification. The Contractor should include the cost of this Work in the construction of concrete foundation Works.
- (b) The number of plastic conduits to be installed in each base will be stipulated on the Drawings or as directed by the Contract Administrator. The conduits shall enter 600mm minimum below ground level and shall protrude the centre of the concrete base. All conduits so terminated above ground shall be plugged by means of plastic plugs, which are to fit snugly in the end of the conduit.

E24.14.6 Placing Concrete

- (a) Care shall be taken to ensure that anchor bolts are vertically aligned and that anchor bolts and conduits are properly positioned prior to placement of concrete.
- (b) Concrete shall not have a free fall of more than 1.5m and shall be placed so that the aggregates will not separate or segregate. The slump of the concrete shall not exceed 110mm. The concrete shall be vibrated throughout the entire length of the foundation.
- (c) Concrete shall be placed to the elevations as shown on the Drawings. The top surface of the foundation shall be finished smooth and even with a hand float.
- (d) Concrete shall be free of water prior to placing concrete. Concrete shall not be placed in or through water unless authorized by Contract Administrator.

E24.14.7 Protection of Newly Placed Concrete

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

E24.14.8 Curing Concrete

- (a) The top of the freshly finished concrete foundations shall be covered and kept moist by means of wet polyester blankets immediately following finishing operations and shall be maintained at above 10 degrees Celsius for at least seven (7) consecutive days thereafter.
- (b) After the finishing is completed, the surface shall be promptly covered with a minimum of a single layer of clean, damp polyester blanket.
- (c) Concrete shall be protected from the harmful effects of sunshine, drying winds, surface dripping or running water, vibration and mechanical shock. Concrete shall be protected from freezing until at least twenty-four (24) hours after the end of the curing period.
- (d) Changes in temperature of the concrete shall be uniform and gradual and shall not exceed 3 degrees Celsius in an hour or 20 degrees Celsius in twenty-four (24) hours.
- (e) Immediately after stripping and patching, formed surfaces shall receive an application of the approved concrete cure and protection system in accordance with the manufacturer's instructions.

E24.14.9 Formal Removal

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

E24.14.10 Patching of Formed Surfaces

- (a) Immediately after forms around the top of foundation have been removed, but before any repairing of surface finishing is started, the concrete surface shall be inspected by the

Contract Administrator. Any repair of surface finishing stated before this inspection may be rejected and required to be removed.

- (b) All formed concrete surfaces shall have bolts, ties, struts, and all other timber or metal parts not specifically required for construction purpose cut back fifty (50) mm from the surface before patching.
- (c) Minor surface defects caused by honeycomb, air pockets greater than 4mm in diameter, and voids left by strutting, and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the area to be patched and the applying patching mortar. A slurry grout consisting of water and cement, shall be well brushed onto the area to be patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck-off slightly higher than the surface and left for one hour before final finishing to permit initial shrinkage of the patching mortar and it shall be touched up until it is satisfactory to the Contract Administrator. The patch shall be cured as specified in this Specification, and the final colour shall match the surrounding concrete.

E24.15 Method of Measurement

- E24.15.1 The construction of cast-in-place concrete light standard foundations will be measured on a unit basis 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.

E24.16 Basis of Payment

- E24.16.1 The supply and installation of cast-in-place concrete light standard foundations will be paid at the contract unit price per unit for "Supply and Install C.I.P Concrete Light Base" 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 the decorative sidewalk 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 and brick pavers.
- E25.3 No direct payment will be made for construction of concrete collars as they shall be considered incidental to concrete sidewalk and paving stone/ brick paver installation.

E26. CONCRETE APPROACH

- E26.1 This Specification shall supplement Standard Construction Specification CW 3310 and shall cover all operations related to the supply and installation of concrete sidewalk.
- E26.2 The Contractor shall construct the proposed approach with block-outs (for unit paving stone) as shown on the Drawings. The block-outs shall be constructed utilizing forming techniques capable of accommodating the proposed paving stone to the dimensions and tolerances as shown on the Drawings and as confirmed with paving stone manufacturer.

E26.3 The concrete approach shall be poured such that the block-outs and remaining concrete approach act as a monolithic section.

E26.4 All costs in connection with the additional forming and placement of concrete as a result of the block-outs and additional depths in areas as shown on the Drawing are incidental and shall be included in the unit price bid for "Supply and Install Concrete Approach".

E26.5 All costs in connection with the testing and approval of concrete are incidental and shall be included in the unit price bid for "Supply and Install Concrete Approach".

E27. REINFORCED CONCRETE PAVEMENT

E27.1 This Specification shall supplement Standard Construction Specification CW 3310 and shall cover all operations related to the supply and installation of concrete sidewalk.

E27.2 The Contractor shall construct the proposed pavement with block-outs (for unit paving stone) as shown on the Drawings. The block-outs shall be constructed utilizing forming techniques capable of accommodating the proposed paving stone to the dimensions and tolerances as shown on the Drawings and as confirmed with paving stone manufacturer.

E27.3 The concrete pavement shall be poured such that the block-outs and remaining concrete approach act as a monolithic section.

E27.4 All costs in connection with the additional forming and placement of concrete as a result of the block-outs and additional depths in areas as shown on the Drawing are incidental and shall be included in the unit price bid for "Supply and Install Reinforced Concrete Pavement".

E27.5 All costs in connection with the testing and approval of concrete are incidental and shall be included in the unit price bid for "Supply and Install Concrete Approach".

E28. CATCH BASIN

E28.1 This Specification shall supplement Standard Construction Specification CW 2130 and shall cover all operations related to the supply and installation of Curb and Gutter Inlet.

E28.2 The Contractor shall supply and install Curb and Gutter Inlet to City of Winnipeg SD 022. All costs in connection with the supply and installation of Curb and Gutter Inlet including but not limited to supply and installation of manhole frame and cover, supply and installation of 250 CB lead, etc. are incidental and shall be included in the unit price bid for "Supply and Install Curb and Gutter Inlet".

E29. FIRE HYDRANT

E29.1 This Specification shall supplement Standard Construction Specification CW 2030 and CW 2110 and shall cover all operations related to the installation of relocated fire hydrant.

E29.2 The Contractor shall install relocated fire hydrant to City of Winnipeg SD 006. All costs in connection with the installation of relocated fire hydrant including but not limited to coring, supply and installation of 150 hydrant lead, supply and installation of valve box, connecting to existing water main, etc. are incidental and shall be included in the unit price bid for "Install Relocated Fire Hydrant".

E30. CONCRETE SIDEWALK

E30.1 This Specification shall supplement Standard Construction Specification CW 3325 and shall cover all operations related to the supply and installation of concrete sidewalk.

- E30.2 The Contractor shall construct the proposed sidewalk with block-outs (for brick and unit paving stone) with a minimum 100mm depth of concrete as shown on the Drawings. The block-outs shall be constructed utilizing forming techniques capable of accommodating the proposed paving stone and brick paving to the dimensions and tolerances as shown on the Drawings and as confirmed with paving stone and brick manufacturer.
- E30.3 The concrete sidewalk shall be poured such that the block-outs and remaining sidewalk act as a monolithic section.
- E30.4 All costs in connection with the additional forming and placement of concrete as a result of the block-outs and additional depths in areas as shown on the Drawing are incidental and shall be included in the unit price bid for "Supply and Install Concrete Sidewalk".
- E30.5 The Contractor shall construct sidewalk ramps to City of Winnipeg SD 229a, SD 229b, SD 229c, SD 229d, SD 229e. All costs in connection with the construction of sidewalk ramps are incidental and shall be included in the unit price bid for "Supply and Install Concrete Sidewalk".
- E30.6 The Contractor shall adjust existing catch basins, manholes, watermain valve boxes, curb stop boxes, etc. to City of Winnipeg specification CW 3210 to meet the finished grade of the proposed sidewalk. All costs in connection with the adjustment of existing catch basins, manholes, watermain valve boxes, curb stop boxes, etc. are incidental and shall be included in the unit price bid for "Supply and Install Concrete Sidewalk".

E31. ASPHALT PATHWAY

E31.1 Description

- E31.1.1 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.

E31.2 Materials

- (a) Subbase as per CW 3110.
- (b) Base course as per CW 3110
- (c) Asphalt to be Type 1A surface course asphalt.

E31.3 Construction Methods

Base Course and Subbase

- E31.3.1 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

- E31.3.2 Compacted asphaltic concrete surface shall be constructed in accordance with City of Winnipeg Specification CW 3410 and the Construction Drawings.

E31.4 Acceptance

E31.4.1 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.

E31.5 Method of Measurement

E31.5.1 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.

E31.6 Basis of Payment

E31.6.1 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.

E32. UNIT PAVING STONE AND BRICK PAVERS

E32.1 Description

E32.1.1 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) New Unit Paving Stones and Brick Pavers in block outs in Concrete Sidewalk Paving.
- (b) New Heavy Duty Unit Paving Stones in block outs in Concrete Sidewalk Paving
- (c) Stockpiled Paving Stones and Brick Pavers in block outs in Concrete Sidewalk.
- (d) New Unit Paving Stones in block outs in Concrete Approaches
- (e) New Etched Precast Concrete Panel in Concrete Approach

E32.1.2 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.

E32.2 General

E32.2.1 Store units in a protected location, immediately upon arrival on the Site.

E32.2.2 Remove from Site any units which have been damaged during transportation and replace.

E32.3 Materials

E32.3.1 Paving Stones and Brick Pavers on Concrete Sidewalk Base, and on Concrete Approach.

- (a) Paving stones shall be Barkman Precast Concrete Pavers as shown on the Construction Drawings and as follows:
 - (i) "Holland Stone" Natural 105 x 210 x 60 mm
 - (ii) "Double Holland Stone" Natural 210 x 210 x 60mm
 - (iii) "Munic" Tan (60mm)
 - (iv) "Holland Stone" Natural 105 x 210 x 80mm
 - (v) "Double Holland Stone" Natural 210 x 210 x 80mm
 - (vi) "Holland Stone" Mahogany 105 x 210 x 80mm
 - (vii) "Munic" Tan (80 mm)

(b) Brick Pavers shall be Endicott Brick Pavers, supplied by Alsip's (Contact Jason Alsip 667-3330) as shown on the Construction Drawings and as follows:

(i) Dark Ironspot Brick Paver- 93 (3 5/8") x 194 (7 5/8") x 57 (2 1/4") mm

(c) Etched precast concrete panel as supplied by:

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

E32.3.2 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.

E32.3.3 Dry Sand/Cement Mix

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

E32.3.4 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.

E32.3.5 Filler Sand

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

E32.4 Construction Methods

E32.4.1 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.

E32.4.2 Concrete Sidewalk Base

- (a) The Concrete Sidewalk Base shall be constructed in accordance with Specification CW 3325 and as shown on the drawings.

E32.4.3 Concrete Approach Base

- (a) The Concrete Approach shall be constructed in accordance with Specification CW 3310, Detail SD-232, and as shown on the drawings.

E32.4.4 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 and brick.
- (c) The cost of supplying and placing bedding sand shall be incidental to the installation of the paving stones and brick.
- (d) No paving stones or brick shall be placed until construction of the underlying layers has been approved by the Contract Administrator.

E32.4.5 Installation of Paving Stones and Brick Pavers

- (a) New Paving Stones and Brick Pavers shall be installed in block out areas on concrete sidewalk and concrete approaches.
- (b) New etched heavy duty precast concrete panel shall be installed in block out areas on concrete approach at Excelsior as indicated on the drawings.
- (c) Existing stockpiled Paving Stones shall be installed in block out areas on concrete sidewalk in the area indicated on the drawings.
- (d) Contractor to verify the exact dimensions of Interlocking Paving Stones and Brick Pavers prior to Installation.
 - (i) Install sand bed to depth specified on Drawings.
 - (ii) Do not compact setting bed prior to installation of pavers or brick.
 - (iii) Spread only sufficient area which can be covered with pavers and brick same day.
 - (iv) Lay pavers and brick 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 and brick 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 and brick against block-out to obtain straightest possible course for installation.
 - (vii) Commence installation of Munic Paving Stones against base of building paving band to obtain straightest possible course for installation.
 - (viii) Pavers and brick shall be cut with a saw only, to obtain true even undamaged edges. Chipped pavers are unacceptable.
 - (ix) Crews shall Work on installed paving stone and brick, not on sand layer.
 - (x) Spread and fine grade brick sand over paving surface and sweep into joints, in several directions.
 - (xi) Compact paving stones and brick with vibratory plate compactor having mass of at least 113 kg.

- (xii) Sweep remaining sand over all paving stone and brick areas and remove from Site.
- (xiii) Replace at no extra cost all whole or cut stones and brick marked as unacceptable.
- (xiv) Remove cracked, chipped, broken or otherwise damaged paving materials from Site immediately.
- (xv) Upon completion, clean in accordance with manufacturer's recommendations.
- (xvi) Grout in place all paving stones/ brick smaller than 2" x 4".
- (xvii) In the area of all sidewalk ramps cut paving stones and brick 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.

E32.5 Method of Measurement

E32.5.1 Supply and Installation of Paving Stone and Brick Pavers

- (a) Supply and installation of Paving Stone and Brick Pavers will be measured on a surface area basis as follows:
 - (i) Supply and Install Endicott Brick Pavers – Dark Ironspot (57 mm)
 - (ii) Supply and Install Holland Stone Paving – Natural (60 mm)
 - (iii) Supply and Install Half Holland Stone Paving – Natural (60 mm)
 - (iv) Supply and Install Double Holland Stone Paving – Natural (60 mm)
 - (v) Supply and Install Tan Munic Paving Stone(60 mm)
 - (vi) Supply and Install Heavy Duty Holland Stone Paving – Mahogany (80 mm), Natural (80mm)
 - (vii) Supply and Install Heavy Duty Double Holland Stone Paving – Natural (80mm)
 - (viii) Supply and Install Heavy Duty Tan Munic Paving Stone (80 mm)
- (b) 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.

E32.5.2 Supply and Installation of Etched Heavy Duty Precast Concrete Panel will be measured on a per unit basis. The number of each item to be paid for shall be in accordance with the Drawings and Specifications and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E32.5.3 Supply and Installation of Stockpiled Interlock Paving Stone will be measured on a surface area basis. The surface area to be paid for shall be total number of square metres installed in accordance with the Drawings and Specifications and accepted by the Contract Administrator, as computed from measurements made by the Contract Administrator.

E32.6 Basis of Payment

E32.6.1 Supply and Installation of Paving Stones

- (a) The supply and installation of Paving Stones will be paid for at the Contract Unit Price per square metre as follows:
 - (i) Supply and Install Endicott Brick Pavers – Dark Ironspot (57 mm)
 - (ii) Supply and Install Holland Stone Paving – Natural (60 mm)
 - (iii) Supply and Install Half Holland Stone Paving – Natural (60 mm)
 - (iv) Supply and Install Double Holland Stone Paving – Natural (60 mm)
 - (v) Supply and Install Tan Munic Paving Stone(60 mm)

- (vi) Supply and Install Heavy Duty Holland Stone Paving – Mahogany (80 mm), Natural (80mm)
 - (vii) Supply and Install Heavy Duty Double Holland Stone Paving – Natural (80mm)
 - (viii) Supply and Install Heavy Duty Tan Munic Paving Stone(80 mm)
- (b) 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.

E32.6.2 The supply and installation of Etched Heavy Duty Precast Concrete Panel will be paid for at the Contract Unit Price per unit 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.

E32.6.3 Installation of Stockpiled Paving Stones

- (a) The installation of Stockpiled Paving Stones will be paid for at the Contract Unit Price per square metre as follows:
- (i) Supply and Install Endicott Brick Pavers – Dark Ironspot (57 mm)
 - (ii) Supply and Install Holland Stone Paving – Natural (60 mm)
 - (iii) Supply and Install Double Holland Stone Paving – Natural (60 mm)
 - (iv) Supply and Install Tan Munic Paving Stone(60 mm)
- (b) 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.

E33. FENCING

E33.1 Description

E33.1.1 This Specification shall cover the supply and installation of the following:

- (a) Gate Structure Fencing
- (b) Gate Structure Planter
- (c) Removable Fence Post Sleeve
- (d) Removable Fence Post Sleeve Compression Cap

E33.2 General

E33.2.1 Store units in a protected location, immediately upon arrival on the Site.

E33.2.2 Remove from Site any units which have been damaged during transportation and replace.

E33.2.3 Shop Drawings

- (a) Submit Structural Engineering stamped shop drawings for review and approval by Contract Administrator prior to manufacture.

E33.3 Products

E33.3.1 Gate Structure Fencing, Planter, and Removable Fence Post Sleeve Compression Cap as supplied by:

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

E33.4 Materials

- E33.4.1 All metal Work hot-dipped galvanized after fabrication.
- E33.4.2 Paint black after galvanizing process. Use approved paint and primer.
- E33.4.3 Manufacturer's standard fittings, fasteners and hardware to be stainless steel or approved alternative.

E33.5 Installation

- E33.5.1 Gate Structure Fencing to be installed as per the drawings and manufacturer's specifications. Prefabricate Fencing as per manufacturer's and City of Winnipeg specifications. Install manufacturer's standard fittings, fasteners and hardware as required.
- E33.5.2 Gate Structure Planter to be installed as per the drawings and manufacturer's specifications. Prefabricate Planter as per manufacturer's and City of Winnipeg specifications. Install manufacturer's standard fittings, fasteners and hardware as required.
- E33.5.3 Removable Fence Post Sleeve to be installed as per the drawings. Concrete Bases specified under Section E22 and E23 of this Specification.
- E33.5.4 Removable Fence Post Sleeve Compression Caps to be installed as per the drawings and manufacturer's specifications. Prefabricate Compression Caps as per manufacturer's specifications. Install manufacturer's hardware as required.

E33.6 Method of Measurement

- E33.6.1 Gate Structure Fencing shall be measured on a per lineal metre basis. The numbers to be paid shall be the total number of lineal metres constructed and installed in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator.
- E33.6.2 Gate Structure Planter shall be measured on a per unit basis. The numbers to be paid shall be the total number of units constructed and installed in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator
- E33.6.3 Removable Fence Post Sleeves 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.
- E33.6.4 Removable Fence Post Sleeve Compression Cap 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.

E33.7 Basis of Payment

- E33.7.1 Supply and Install Gate Structure Fencing will be paid for at the contract unit price per lineal metre for "Supply and install Gate Structure Fencing" 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.
- E33.7.2 Supply and Install Gate Structure Planter will be paid for at the contract unit price per unit for "Supply and install Gate Structure Planter" 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.
- E33.7.3 Supply and Install removable fence post sleeve will be paid for at the contract unit price per unit for "Supply and install Removable Fence Post Sleeve" 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.

E33.7.4 Supply and Install removable fence post sleeve compression cap will be paid for at the contract unit price per unit for "Supply and install Removable Fence Post Sleeve Compression Cap" 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.

E34. STEEL BOLLARD

E34.1 Description

E34.1.1 Work under this section shall include all labour, materials, equipment and services necessary for the installation of:

- (a) Laser Cut steel bollard
- (b) Removable steel bollard
- (c) Concrete Filled Steel Bollard

E34.2 General Delivery and Storage

E34.2.1 Store units in a protected location immediately upon arrival on the Site.

E34.2.2 Remove and replace any units which have been damaged during transportation.

E34.3 Products

E34.3.1 Laser Cut Steel Bollard supplied by:

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

E34.3.2 Removable Steel Bollard supplied by:

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

E34.3.3 Concrete Bases specified under Section E23 of this Specification.

E34.4 Materials

E34.4.1 Steel pipe for bollards shall be 150mm 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.

E34.4.2 Hot-dipped galvanized after fabrication.

E34.4.3 Paint black after galvanizing process. Use approved paint and primer.

E34.5 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.

E34.6 Method of Measurement

E34.6.1 The supply and installation of Steel Bollards will be measured on a unit basis for each item, as follows:

- (i) Supply and Install Laser Cut Bollard
- (ii) Supply and Install Removable Steel Bollard
- (iii) Supply and Install Concrete Filled Steel Bollard

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.

E34.7 Basis of Payment

E34.7.1 The supply and installation of Steel Bollards will be paid for at the Contract Unit Price for each item, 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 as follows:

- (i) Supply and Install Laser Cut Bollard
- (ii) Supply and Install Removable Steel Bollard
- (iii) Supply and Install Concrete Filled Steel Bollard

E35. SITE FURNITURE

E35.1 Description

E35.1.1 This specification covers the supply and installation of:

- (a) Waterfront Drive Style Bench

E35.2 General

E35.2.1 Store units in a protected location, immediately upon arrival on the Site.

E35.3 Products

E35.3.1 Waterfront Drive Benches supplied by:

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

E35.4 Installation

- (a) Benches shall be installed in locations as indicated on the Construction Drawings.
- (b) Benches to be installed as per 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.

E35.5 Method of Measurement

E35.5.1 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.

E35.6 Basis of Payment

- E35.6.1 Supply and Installation of Site furniture shall be at the per unit price bid for "Waterfront Drive Style Bench" 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.

E36. LIMESTONE FLAGSTONE

E36.1 Description

- E36.1.1 Work under this section shall include all labour, materials, equipment and services including supply and installation of sand setting bed necessary for the installation of:

- (a) Supply and installation of Limestone Flagstone.
- (b) Installation of stockpiled Limestone Flagstone.

E36.2 Materials

- E36.2.1 All Limestone shall be Manitoba Tyndall limestone blasted rock of various sizes. Limestone to be free of clay pockets.

- E36.2.2 All Limestone to match existing limestone flagstone used at existing Waterfront Drive planters.

E36.2.3 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.

E36.3 Installation

- (a) Limestone Flagstone shall be installed in locations as indicated on the Construction Drawings.
- (b) Placement of flagstone to match existing Limestone Flagstone in planters along Waterfront Drive.

E36.4 Method of Measurement

- E36.4.1 Supply and Installation of Limestone Flagstone will be measured on a square metre basis. Installation of Stockpiled Limestone Flagstone will be measured on a square metre 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.

E36.5 Basis of Payment

- E36.5.1 Supply and Installation of Limestone Flagstone shall be paid at the unit price per square metre bid for "Supply and Install Limestone Flagstone" 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.

- E36.5.2 Installation of Stockpiled Limestone Flagstone shall be paid at the unit price per square metre bid for "Installation of Stockpiled Limestone Flagstone" 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.

E37. PLANT MATERIAL

E37.1 Description

E37.1.1 The following list generally describes the scope of this section:

- (a) Supply and installation of trees and shrubs including preparation, digging, transport and planting.
- (b) Maintenance of Trees and Shrubs during establishment period (minimum 30 days or until Total Performance whichever is longer). Refer to Extended Maintenance of Trees and Plant Material for extended tree and shrub maintenance period.

E37.2 General

E37.2.1 Source Quality Control

- (a) Obtain approval of plant material at source. All plant material will be field approved by the Contract Administrator. The Contractor shall notify the Contract Administrator to organize the inspection, a minimum of 5 Working days prior to installation.
- (b) No Work under this Special Provision is to proceed without approval.
- (c) Acceptance of plant material at source does not prevent rejection on Site prior to or after planting operations.
- (d) Source of all plant material to be Manitoba.

E37.2.2 Source for 150mm caliper Discovery Elm
Jefferies Nurseries Ltd.
Box 402,
Portage La Prairie, MB. R1N 3B7
Phone: (204) 857-5288
Fax: (204) 857-2877

E37.2.3 Shipment and Pre-Planting Care

- (a) Co-ordinate shipping of plants and excavation of holes to ensure minimum time lapse between digging and planting.
- (b) Tie branches of trees and shrubs securely and protect plant material against abrasion, exposure and extreme temperature change during transit. Avoid binding of planting stock with rope or wire which would damage bark, break branches or destroy natural shape of plant. Give full support to root ball of large trees during lifting.
- (c) Cover plant foliage with tarpaulin, and protect bare roots by means of dampened straw, peat moss, sawdust or other acceptable material to prevent loss of moisture during transit and storage.
- (d) Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 50 mm diameter with wound dressing.
- (e) Keep roots moist and protected from sun and wind. Heel-in trees, which cannot be planted immediately, in shaded areas, and water well.

E37.2.4 Guarantee

- (a) The Contractor hereby warrants that the plant material as itemized on the plant list will remain free of defects for the duration of the two year maintenance period indicated in E39 (Until November 2, 2007). End-of-warranty inspection will be conducted.
- (b) The Contractor agrees and guarantees to replace and replant any nursery stock found dead or in poor condition for the warranty period from date of Certificate of Total Performance, without cost to the City. "Poor Condition" shall be interpreted as meaning nursery stock on which branches are dead or dying, or have not shown satisfactory growth in leaves. Exempted is nursery stock damaged by accidental causes or vandalism, which stock shall be replaced at the cost of the owner.

- (c) The Contract Administrator reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

E37.2.5 Replacement

- (a) During warranty period, remove from Site any plant material that has died or failed to grow satisfactorily as determined by the Contract Administrator.
- (b) Replace plant material as directed by the Contract Administrator.
- (c) Extend warranty on replacement plant material for a period equal to the original warranty period.
- (d) Continue such replacement and warranty until plant material is acceptable.

E37.3 Materials

E37.3.1 Water

- (a) Water should be potable and free of minerals which may be detrimental to plant growth.

E37.3.2 Root Ball Burlap

- (a) Root ball burlap should be 150 g Hessian burlap.

E37.3.3 Anti-Desiccant

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

E37.3.4 Wound Dressing

- (a) Wound dressing should be horticulturally accepted non-toxic, non-hardening emulsion.

E37.3.5 Plant Material

- (a) Quality and Source: Comply with Guide Specification for Nursery Stock, 1982 Edition of Canadian Nursery Trades Association, referring to size and development of plant material and root ball.
- (b) Measure plants when branches are in their natural position. Height and spread dimensions refer to main body of plant and not from branch tip to branch tip. Use trees and shrubs of No. 1 grade.

E37.3.6 Additional plant material qualifications

- (a) Use trees and shrubs with strong fibrous root system free of disease, insects, defects or injuries and structurally sound. Use trees with straight trunks, well and characteristically branched for species. Plant must have been root pruned regularly, but not earlier than one growing season prior to arrival on Site.

E37.3.7 Cold Storage

- (a) Approval required for plant material which has been held in cold storage.

E37.3.8 Container - Grown Stock

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

E37.3.9 Balled and Burlapped

- (a) Deciduous trees in excess of 3m height must have been dug with large firm ball. Root balls must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light sandy or rocky soil. Secure root balls with burlap, heavy twine and rope. For large trees: wrap ball in double layer of burlap and drum lace with minimum 10 mm dia. rope. Protect root balls against sudden changes in temperature and exposure to heavy rainfall.

E37.3.10 Tree Spade Dug Material

- (a) Dig plant material with mechanized digging equipment of hydraulic spade or clam-shell type. Root balls to satisfy CNTA standards. Lift root ball from hole, place in wire basket designed for purpose and line with burlap. Replace root ball and tie basket to ball with heavy rope. Take care not to injure trunk of tree with wire basket ties or rope.

E37.3.11 Substitutions

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

E37.4 Construction Methods

E37.4.1 Workmanship

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

E37.4.2 Planting Time

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

E37.4.3 Excavations

- (a) Refer to Preparation of Planting Beds. All excavation for installation of plant material is incidental and shall be included in the unit price bid for supply and installation of Plant Material unless otherwise noted.
- (b) Protect bottom of excavations against freezing.
- (c) Remove water which enters excavations prior to planting. Ensure source of water is not ground water.

E37.4.4 Planting

- (a) Loosen bottom of planting hole to depth of 150 to 200 mm.
- (b) Plant trees and shrubs vertically with roots placed straight out in hole. Orient plant material to give best appearance in relation to structure, roads and walks.
- (c) Place plant material to depth equal to depth they were originally growing in nursery.

- (d) With balled and burlapped roots balls, loosen burlap and cut away minimum top 1/3 without disturbing root ball. Do not pull burlap or rope from under root ball. With container stock, remove entire container without disturbing root ball. Non bio-degradable wrappings must be removed.
- (e) Tamp planting soil around root system in layers of 150 mm eliminating air voids. Frozen or saturated planting soil is unacceptable. When 2/3 of planting soil has been placed, fill hole with water. After water has been completely penetrated into soil, complete backfilling.
- (f) Build 100 mm deep saucer around outer edge of hole to assist with maintenance watering.
- (g) When planting is completed, give surface of planting saucer dressing of organic 10-6-4 fertilizer at rate of 12 kg/100 m for shrub beds or 40 to 50 g/mm of calliper for trees. Mix fertilizer thoroughly with top layer of planting soil and water in well.

E37.4.5 Pruning

- (a) Prune trees after planting as noted below. Postpone pruning of those trees where heavy bleeding may occur, until in full leaf. Employ clean sharp tools and make cuts flush with main branch, smooth and sloping as to prevent accumulation of water.
- (b) Remove projecting stumps on trunks or main branches. Remove dead and injured branches and branches that rub causing damage to bark. Trim trees without changing their natural shape. Do not damage lead branches or remove smaller twigs along main branches.
- (c) Prune Deciduous Trees to min 2.4 m clear stem height.

E37.4.6 Maintenance

- (a) Refer to E62 for Extended Maintenance of all plant material until September 30, 2006 (Two Year Maintenance) Extended maintenance to begin when plant material has been accepted and Certificate of Total Performance has been issued.
- (b) After completion of planting operation to the satisfaction of the Contract Administrator, the Contractor shall be responsible for the maintenance of the plant material during establishment period until accepted and Certificate of Total Performance has been issued.
- (c) Replace any dead or damaged plant material during the maintenance period, including replacement of vandalized material.
- (d) Water sufficiently to maintain optimum growing conditions. Ensure adequate moisture in root zone at freeze-up.

E37.4.7 Maintenance Materials

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

E37.4.8 Personnel

- (a) The Contractor shall provide all necessary personnel for the ongoing maintenance operations.
- (b) Personnel should have at least one year of experience in landscape maintenance and should be under the direction of a foreman, in all cases, with not less than five years of experience with similar maintenance operations.

E37.4.9 Maintenance Methods

- (a) Watering Shrubs and Trees

- (i) All trees and shrubs shall be watered as required.
 - (ii) To determine the need for watering, make a soil test weekly with a one-inch auger. Take a test sample from both the planting soil and from the root area by drilling to a minimum depth of 600 mm. The soil shall contain enough moisture to hold together when compressed in the hand, but not be muddy.
 - (iii) During the hot season soak thoroughly approximately every week to ten days, depending on soil conditions. Take soil sample periodically, using an earth auger, until the maintenance personnel are familiar with soil conditions.
 - (iv) If soil is dry because of insufficient rain in the late fall, water plant material sufficiently to soak the entire root area before the earth freezes.
- (b) Fertilizing Shrubs and Trees
- (i) Fertilizing shrub beds using a 10-6-4 mixture of fertilizer.
 - (ii) Fertilize trees using a 10-6-4 mixture of fertilizer.
- (c) Cultivation
- (i) Cultivate planters and tree pits to keep the top layer of soil loose, friable and free of weeds. Never cultivate soil more than 50 mm. Maintain 100 mm depth of wood chip mulch in planters and planting beds.
- (d) Spraying
- (i) Spray trees, shrubs, perennials and annuals to control insect pests and diseases. Use horticulturally recommended compounds specific for the problem to be contained. Do not use DDT or sprays prohibited by Agriculture Canada.
- (e) Adjustments
- (i) Make adjustments requested by the Contract Administrator including straightening.

E37.5 Method of Measurement

E37.5.1 Supply and Installation of Plant Material will be measured on a unit basis. The number of units to be paid shall be the total number of units supplied and installed in accordance with the Drawings and Specifications and as measured and accepted by the Contract Administrator.

E37.6 Basis of Payment

E37.6.1 Supply and Installation of Plant Material will be paid for at the Contract Unit Price per unit for "Supply and Installation of Plant Material", 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.

E38. PREPARATION OF PLANTING BEDS

E38.1 Description

E38.1.1 Scope of Work

- (a) The following generally describes the scope of this Section:
 - (i) Supply and Install minimum 450 mm planting soil mixture, filter cloth and bark nugget mulch in planting beds. Excavate and dispose of existing unsuitable soil/ granular base as required.

E38.1.2 Samples

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

- (i) Planting Soil Mixture: 1 kg.
- (ii) Bark Nugget Mulch: 0.5 kg.

E38.1.3 Delivery and Storage

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

E38.2 Materials

E38.2.1 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.

E38.2.2 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.

E38.2.3 Sand: hard, granular natural beach sand, washed free of impurities, chemical or organic matter.

E38.2.4 Fertilizer: commercial type with 50% of the elements derived from organic sources.

E38.2.5 Bonemeal: shall be raw bonemeal, finely ground with a minimum analysis of 3% nitrogen and 20% phosphoric acid.

E38.2.6 Filter Fabric: Texpro 250 Woven Filter Fabric.

E38.2.7 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

E38.2.8 Bark Nugget Mulch: Bark Chip: varying in size from 25 mm to 50 mm in diameter from bark of coniferous trees.

E38.3 Construction Methods

E38.3.1 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.

E38.3.2 Preparation of Planting Beds

- (a) Install planting soil mixture, filter cloth and stone mulch to depth shown on the Drawings.

E38.4 Method of Measurement

E38.4.1 Planting soil mixture for planters and planting beds will be measured on a cubic metre basis. Filter fabric for planters and planting beds will be measured on a square metre basis. Bark Nugget mulch for planting beds will be measured on a square metre basis.

E38.5 Basis of Payment

E38.5.1 Payment for Supply and Installation of Planting Soil for Planting Bed (min. 300mm depth) will be made at the Contract Unit Price 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.

E38.5.2 Payment for Supply and Installation of Filter Cloth for Planting Beds will be made at the Contract Unit Price 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.

E38.5.3 Payment for Supply and Installation of Bark Nugget Mulch (100 mm depth) will be made at the Contract Unit Price 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.

E39. EXTENDED MAINTENANCE OF TREES AND PLANT MATERIAL

E39.1 Description

E39.1.1 This Specification shall deal with the maintenance of the trees, shrubs, perennials and annuals from:

- (a) The date of the Certificate of Total Performance to November 2, 2007.

E39.2 Scope of the Work

E39.2.1 The following generally describes the scope of this Specification:

- (a) Maintenance of Trees.
- (b) Maintenance of Shrubs.

E39.3 Materials

E39.3.1 The Contractor shall provide all necessary equipment, including: tractors, trimmers, fertilizer spreaders, pruning tools, water trucks, hoses, water meters, and any other items necessary for the maintenance of the area indicated in this Specification.

E39.3.2 Personnel

- (a) The Contractor shall provide all necessary personnel for the ongoing maintenance operations.

E39.3.3 Areas

- (a) The following areas shall be part of the maintenance jurisdiction:
 - (i) The trees as indicated on the Construction Drawings.
 - (ii) All shrubs as indicated on the Construction Drawings.

E39.4 Work Included

E39.4.1 Water Trees

- (a) All trees shall be watered bi-weekly, or during the summer, if temperatures are fairly high and there has been no rainfall, water approximately once a week. Where irrigation is not available this should be executed by leaving a hose, with a gentle rate of flow, running into the saucer of the root ball for about one hour.

- (b) To determine the need for watering, make a soil test weekly with a one-inch auger. Take a test sample from both the planting soil and from the root ball by drilling to a minimum depth of 600 mm. The soil shall contain enough moisture to hold together when compressed in the hand, but shall not be muddy.

E39.4.2 Fertilizing, Pruning and Spraying Deciduous Trees

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

E39.4.3 Tighten, or remove, turnbuckles or guy wires for trees as required or directed by the Contract Administrator.

E39.4.4 Straighten trees as required and directed by the Contract Administrator.

E39.4.5 General Maintenance

- (a) Clean up litter and debris in tree cover bi-weekly.
- (b) Clean up litter and debris in tree well (under tree cover and sidewalk panels) twice yearly (in the spring and fall)

E39.4.6 Maintenance of Trees and Shrubs

- (a) From time of acceptance by Contract Administrator to end of warranty period, perform following maintenance operations:
 - (i) Water to maintain soil moisture conditions for optimum growth and health of plant materials without causing erosion.
 - (ii) Reform damaged watering saucers.
 - (iii) Remove weeds monthly.
 - (iv) Replace or respread damaged, missing or distributed mulch.
 - (v) For non-mulched areas, cultivate monthly to keep top layer of soil friable.
 - (vi) Apply pesticides in accordance with Federal, Provincial and Municipal regulations as and when required to control insects, fungus and disease. Obtain product approval from Contract Administrator prior to application.
 - (vii) Apply fertilizer in early spring based on soil test results.
 - (viii) Remove dead, broken, or hazardous branches from plant material.
 - (ix) Keep tree supports in proper repair and adjustment.
 - (x) Remove tree supports and level watering saucers at end of warranty period.
 - (xi) Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.
 - (xii) Submit monthly written reports to Contract Administrator identifying:
 - i) Maintenance Work carried out.
 - ii) Development and condition of plant material.
 - iii) Preventative or corrective measures required which are outside Contractor's responsibility.
 - (xiii) Remove all garbage from planting beds and planters.

E39.5 Guarantee of Work

E39.5.1 The Contractor shall agree and guarantee to replace and replant any nursery stock found dead or in poor condition at the completion of the maintenance period. "Poor Condition" shall be interpreted as meaning nursery stock in which branches are dead or dying, or have not shown satisfactory growth of leaves. All replacements shall be of same size and species, as specified.

E39.6 Method of Measurement

E39.6.1 Extended Maintenance will be on a lump sum basis, in accordance with the Construction Drawings and as accepted by the Contract Administrator.

E39.7 Basis of Payment

E39.7.1 Payment for Extended Maintenance as specified under this section shall be on a lump sum basis. Price bid for extended maintenance of shrubs shall be separated from price bid for extended maintenance of shrubs. Payment shall be made in two equal instalments (50% each), payable on satisfactory completion on the first and second anniversary of the recognized date of completion for Two Years Maintenance.

E39.8 Acceptance

E39.8.1 Upon the second anniversary of the recognized date of completion, or similarly the end of the required maintenance period, a Site inspection shall be held. If at this time, all material and Works is satisfactory the Contract for maintenance and warranty shall be terminated.

E40. ASPHALT PAVEMENT

E40.1 This Specification shall supplement Standard Construction Specification CW 3410 and shall cover all operations related to the supply and installation of asphalt pavement.

E40.2 All costs in connection with the testing and approval of asphalt are incidental and shall be included in the unit price bid for "Supply and Install Light Duty Asphalt Pavement" and "Supply and Install Heavy Duty Asphalt Pavement".

E41. CORRUGATED METAL PIPE

E41.1 Description

E41.1.1 The Work of this section comprises the furnishing of all labour, equipment and materials incidental and required to complete the supply and installation of corrugated metal pipe as shown on the drawings and as hereinafter specified, including but not necessarily confined to:

- (a) Construction of CIP Concrete Light Standard Base as shown on the Drawings.

E41.2 Materials

- (a) All pipe, fittings and other accessories or appurtenances shall conform to the requirements of this specification and the requirements of CSA Specification CAN3-G40I for Corrugated Steel Pipe (CSP)

E41.3 Acceptance

E41.3.1 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.

E41.4 Method of Measurement

E41.4.1 Corrugated Metal Pipe shall be measured on a unit basis. The number of units to be paid for shall be the total number of units placed in accordance with this Specification and the Construction Drawings, as determined by the Contract Administrator.

E41.5 Basis of Payment

E41.5.1 Corrugated Metal Pipe will be paid for at the contract unit price per unit for Supply and Install 3500mm length 450 dia. Corrugated Metal Pipe 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.