



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 721-2016

**LYNDALE DRIVE – MONCK AVENUE TO GAUVIN STREET, RIVERBANK
STABILIZATION AND ASSOCIATED WORKS**

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 Lyndale Drive – Monck Avenue to Gauvin Street, Riverbank Stabilization and Associated Works

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 12:00 noon Winnipeg time, October 13, 2016.

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

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

B3. ENQUIRIES

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

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

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

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

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

B4. CONFIDENTIALITY

B4.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

- (a) was known to the Bidder before receipt hereof; or
- (b) becomes publicly known other than through the Bidder; or
- (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B4.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Bid Opportunity to the media or any member of the public without the prior written authorization of the Contract Administrator.

B5. ADDENDA

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

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

B6. SUBSTITUTES

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

- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her 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 B16.
- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B7. BID COMPONENTS

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid;
 - (b) Form B: Prices, hard copy;
 - (c) Bid Security
 - (i) Form G1: Bid Bond and Agreement to Bond, or
Form G2: Irrevocable Standby Letter of Credit and Undertaking, or
a certified cheque or draft;
- B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.
- B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B7.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B7.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.
- B7.4.2 A hard copy of Form B: Prices must be submitted with the Bid. If there is any discrepancy between the Adobe PDF version of Form B: Prices and the Microsoft Excel version of Form B: Prices, the PDF version shall take precedence.
- B7.5 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.
- B7.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B16.1(a).
- B7.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B7.8 Bids shall be submitted to:
- The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1

B8. BID

- B8.1 The Bidder shall complete Form A: Bid, making all required entries.

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

B9. PRICES

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.1.1 For the convenience of Bidders, and pursuant to B7.4.2 and B16.4.2, an electronic spreadsheet Form B: Prices in Microsoft Excel (.xls) format is available along with the Adobe PDF documents for this Bid Opportunity on the Bid Opportunities page at the Materials Management Division website at <http://www.winnipeg.ca/matmgt/>
- B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.
- B9.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B10. DISCLOSURE

- B10.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full

disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.

B10.2 The Persons are:

- (a) N/A

B11. QUALIFICATION

B11.1 The Bidder shall:

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

B11.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

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

B11.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

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

B11.4 Further to B11.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:

- (a) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; or
- (b) a copy of their valid Manitoba SECOR™ certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR™) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY™ COR™ Program; 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 Division website at <http://www.winnipeg.ca/matmgt/>).

B11.5 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B11.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B12. BID SECURITY

B12.1 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.

B12.1.1 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.

B12.1.2 All signatures on bid securities shall be original.

B12.1.3 The Bidder shall sign the Bid Bond.

B12.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.

B12.2 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.

B12.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B12.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.

B12.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.

B12.3 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.

B13. OPENING OF BIDS AND RELEASE OF INFORMATION

B13.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.

B13.1.1 Bidders or their representatives may attend.

B13.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B12 will not be read out.

B13.2 Following the submission deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

B13.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page

at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

- B13.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B14. IRREVOCABLE BID

- B14.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.
- B14.2 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.

B15. WITHDRAWAL OF BIDS

- B15.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B15.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.
- B15.1.2 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.
- B15.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:
- (a) retain the Bid until after the Submission Deadline has elapsed;
 - (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
 - (c) if the notice has been given by any one of the persons specified in B15.1.3(b), declare the Bid withdrawn.
- B15.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B14.2 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.

B16. EVALUATION OF BIDS

- B16.1 Award of the Contract shall be based on the following bid evaluation criteria:
- (a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation therefrom (pass/fail);
 - (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B11 (pass/fail);
 - (c) Total Bid Price;
 - (d) economic analysis of any approved alternative pursuant to B6.
- B16.2 Further to B16.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other

irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

B16.3 Further to B16.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.

B16.4 Further to B16.1(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.

B16.4.1 Further to B16.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B16.4.2 The electronic Form B: Prices and the formulas imbedded in that spreadsheet are only provided for the convenience of Bidders. The City makes no representations or warranties as to the correctness of the imbedded formulas. It is the Bidder's responsibility to ensure the extensions of the unit prices and the sum of Total Bid Price performed as a function of the formulas within the electronic Form B: Prices are correct.

B17. AWARD OF CONTRACT

B17.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B17.2 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.

B17.2.1 Without limiting the generality of B17.2, 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.

B17.3 Award of this Contract is contingent upon Council approval of sufficient funding to complete the Work of this Contract. If funding is not approved by Council, or if the approved funding is not sufficient for the Work, the City will have no obligation to award a Contract.

B17.4 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B16.

B17.4.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

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

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

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

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of the stabilization and protection of the existing Lyndale Drive riverbank between approximately Monck Avenue and Gauvin Street, the construction of new pathways, and associated roadworks.

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

(a) Riverbank Stabilization

- (i) Construction of temporary access ramp(s) and working platform;
- (ii) Drilling of rockfill column shafts;
- (iii) Supply, placement and compaction of rockfill for rockfill columns
- (iv) Supply and placement of rip rap erosion protection;
- (v) Removal of temporary access ramp(s) and reshaping of riverbank;
- (vi) Construction of limestone terrace below elevation 225.00;
- (vii) Installation of riverbank erosion control blanket.

(b) Riverbank Grading and Trail Construction

- (i) Demolition of existing wall;
- (ii) Riverbank grading including the supply and placement of imported fill;
- (iii) Construction of gravel riverbank trail including gabion wall alcoves
- (iv) Construction of limestone terrace above elevation 225.00;
- (v) Site restoration, topsoil and plantings.

(c) Road and Sidewalk Works

- (i) Removal of existing asphalt pavement and curbs.
- (ii) Milling of existing asphalt pavement.
- (iii) Installation of catch basins, subdrains and sewer service pipe.
- (iv) Curb and gutter installation (100 mm curb height).
- (v) Placement of geotextile fabric, subbase material, and base course for sidewalk.
- (vi) Placement of asphalt pavement for sidewalk (Type 1A, 75 mm thick (1 lift)).
- (vii) Widen existing roadway (excavation, subgrade compaction, geotextile fabric, subbase material and base course).
- (viii) Installation of catchpits and drainage connection pipe.
- (ix) Curb and gutter installation (100 mm curb height).
- (x) Placement of asphalt pavement (Type 1A, 100 mm thick (2 lifts)).
- (xi) Adjustment of existing manholes and appurtenances.
- (xii) Placement of asphalt overlay (Type 1A, average thickness 50 mm (1 lift)).
- (xiii) Boulevard restoration and landscaping.

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is Trek Geotechnical, represented by:

Michael Van Helden, Ph.D., P.Eng.

Telephone No. 204 975 9433

Email Address mvanhelden@trekgeotechnical.ca

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

D3.3 Bids Submissions must be submitted to the address in B7

D4. CONTRACTOR'S SUPERVISOR

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

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

D5. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

D5.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.

D5.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.

D5.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;

(a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;

(b) the Contract, all deliverables produced or developed; and

(c) any statement of fact or opinion regarding any aspect of the Contract.

D5.4 A Contractor who violates any provision of D5 may be determined to be in breach of Contract.

D6. NOTICES

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

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

- D6.3 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 facsimile number:

The City of Winnipeg
Legal Services Department
Attn: Director of Legal Services

Facsimile No.: 204-947-9155

- D6.4 Bids Submissions must not be submitted to this facsimile number. Bids must be submitted in accordance with B7.**

D7. FURNISHING OF DOCUMENTS

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

SUBMISSIONS

D8. AUTHORITY TO CARRY ON BUSINESS

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

D9. SAFE WORK PLAN

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

D10. INSURANCE

- D10.1 The Contractor shall provide and maintain the following insurance coverage:
- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability, broad form property damage cover and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
 - (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence;
 - (c) an all risks Installation Floater carrying adequate limits to cover all machinery, equipment, supplies and/or materials intended to enter into and form part of any installation.

- D10.2 Deductibles shall be borne by the Contractor.
- D10.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in the C4.1 for the return of the executed Contract.
- D10.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D11. PERFORMANCE SECURITY

- D11.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:
- (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
 - (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
 - (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.
- D11.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.
- D11.2 If the bid security provided in his/her Bid was not a certified cheque or draft pursuant to B12.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site and in no event later than the date specified in the C4.1 for the return of the executed Contract.

D12. SUBCONTRACTOR LIST

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

D13. EQUIPMENT LIST

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

D14. DETAILED WORK SCHEDULE

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

- D14.2 The detailed work schedule shall consist of the following:
- (a) a Gantt chart for the Work based on the C.P.M. schedule; acceptable to the Contract Administrator.
- D14.3 Further to D14.2(a), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

SCHEDULE OF WORK

D15. COMMENCEMENT

- D15.1 The Contractor shall not commence any Work until he/she is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.
- D15.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D8;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the twenty-four (24) hour emergency response phone number specified in D4.2.
 - (iv) the Safe Work Plan specified in D9;
 - (v) evidence of the insurance specified in D10;
 - (vi) the performance security specified in D11;
 - (vii) the subcontractor list specified in D12;
 - (viii) the equipment list specified in D13; and
 - (ix) the detailed work schedule specified in D14.
 - (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.
- D15.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.
- D15.4 The City intends to award this Contract by November 24, 2016.
- D15.4.1 If the actual date of award is later than the intended date, the dates specified for Critical Stages, Substantial Performance, and Total Performance will be adjusted by the difference between the aforementioned intended and actual dates.

D16. RESTRICTED WORK HOURS

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

D17. WORK BY OTHERS

- D17.1 Work by others on or near the Site will include but not necessarily be limited to:
- (a) Manitoba Hydro – maintenance of existing street lighting, as required;
 - (b) City of Winnipeg Naturalist Services – planting of shrubs and small diameter trees on riverbank;
 - (c) Contract Administrator – Instrumentation monitoring, repair and/ or installation of new riverbank instrumentation;

- (d) Various works on survey monuments by Geomatics Services Branch of the Planning Property and Development Department at various locations throughout the sites.

D18. SEQUENCE OF WORK

D18.1 Further to C6.1, the sequence of work shall be as follows:

- D18.1.1 The Contractor shall maintain the existing street lighting on Lyndale Drive at all times until the proposed street lighting is complete. Any damage caused to the existing street lighting shall be repaired at the Contractor's own cost
- D18.1.2 Rockfill column installation shall commence at the downstream end of the project site, proceeding in an upstream direction, unless otherwise approved by the Contract Administrator. If two drill rigs are utilized to install rockfill columns, they should commence at both the upstream and downstream ends and proceed towards the middle of the site.
- D18.1.3 No roadworks shall commence on Lyndale Drive until June 19, 2017 due to the Manitoba Marathon.
- D18.1.4 Riverbank grading shall be complete prior to placement of asphalt pavement on the sidewalk adjacent to Lyndale Drive.
- D18.1.5 Following installation of topsoil on riverbank, the Contractor shall allow the City of Winnipeg to proceed with seeding prior to planting trees. While the Contractor is planting trees, the City of Winnipeg will also be planting shrubs and small diameter trees.
- D18.1.6 The sidewalk on the south side of Lyndale Drive, not including asphalt paving, shall be completed and opened to pedestrian access prior to proceeding with the widening and curb and gutter installation on the north side of Lyndale Drive.

D19. CRITICAL STAGES

- D19.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:
- (a) "Riverbank Stabilization" as defined in D2.2(a) must be complete by March 15, 2017.
- (b) "Riverbank Grading and Trail Construction" as defined in D2.2(b) must be complete by July 15, 2017.
- D19.2 The Contractor bears all risk associated with elevated river levels impacting their execution of the Work. A hydraulic assessment report is available in Appendix 'A'. A memorandum on Red River Flood Level Probabilities (including a water level- probability relationship) is available in Appendix 'A'.
- D19.3 When the Contractor considers the Work associated with the Critical Stages to be completed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Completion. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D19.4 The date on which the Critical Stages have been accepted by the Contract Administrator as being completed to the requirements of the Contract is the date on which completion of the Critical Stage has been achieved.

D20. SUBSTANTIAL PERFORMANCE

- D20.1 The Contractor shall achieve Substantial Performance by September 1, 2017.
- D20.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted

during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.

- D20.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

D21. TOTAL PERFORMANCE

- D21.1 The Contractor shall achieve Total Performance by September 15, 2017.
- D21.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D21.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

D22. LIQUIDATED DAMAGES

- D22.1 If the Contractor fails to achieve Critical Stages, Substantial Performance or Total Performance in accordance with the Contract by the days fixed herein for same, the Contractor shall pay the City the following amounts per Calendar Day for each and every Calendar Day following the days fixed herein for same during which such failure continues:
- (a) "Riverbank Stabilization" – three thousand dollars (\$3,000)
 - (b) "Riverbank Grading and Trail Construction" – three thousand dollars (\$3,000)
 - (c) Substantial Performance – three thousand dollars (\$3,000)
 - (d) Total Performance – one thousand dollars (\$1,000)
- D22.2 The amounts specified for liquidated damages in D22.1 are based on a genuine pre-estimate of the City's losses in the event that the Contractor does not achieve critical stages, Substantial Performance or Total Performance by the days fixed herein for same.
- D22.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D23. SCHEDULED MAINTENANCE

- D23.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:
- (a) Reflective Crack Sealing during one year warranty as specified in CW3250;
 - (b) Sodding as specified in CW3510;
 - (c) Trees, shrubs and groundcover plantings as specified in E26;
 - (d) Landscape maintenance as specified in E27.
- D23.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

CONTROL OF WORK

D24. JOB MEETINGS

- D24.1 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.
- D24.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

D25. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

- D25.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

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

- D26.1 Further to B11.4, the Contractor/Subcontractor must, throughout the term of the Contract, have a Workplace Safety and Health Program meeting the requirements of The Workplace Safety and Health Act (Manitoba). At any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require updated proof of compliance, as set out in B11.4.

MEASUREMENT AND PAYMENT

D27. PAYMENT

- D27.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

D28. DAMAGE TO EXISTING STRUCTURES AND PROPERTY

- D28.1 Further to Section 3.13 of CW 1130 of the General Requirements, special care will be taken to avoid damage to existing adjacent structures and properties during the course of Work.
- D28.2 Any damage caused by the Contractor or his Subcontractors to the adjacent structure properties shall be promptly repaired by the Contractor at his own expense to the satisfaction of the Contract Administrator.

D29. ENVIRONMENTAL PROTECTION PLAN

- D29.1 The Contractor shall plan and implement the Work of this Contract strictly in accordance with the requirements of the Environmental Protection Plan as herein specified.
- D29.2 The Contractor is advised that at least the following Acts, Regulations, and By-laws apply to the Work:
- (a) Federal
 - (i) Canadian Environmental Assessment Act (CEAA), 1992 c.37;
 - (ii) Canadian Environmental Protection Act;
 - (iii) Fisheries Act, 1985 c.F-14;
 - (iv) Transportation of Dangerous Goods Act and Regulations, c.34;
 - (v) Migratory Birds Convention Act and Regulations, c.22;

- (vi) Species at Risk Act, c.29;
 - (vii) Transportation Association of Canada's Transportation Association of Canada *National Guide to Erosion and Sediment Control on Roadway Projects*, 2005;
 - (viii) Applicable Fisheries and Oceans Canada Operational Statements for Manitoba for Temporary Stream Crossings;
 - (ix) The Department of Fisheries and Oceans *Freshwater Intake End-of-Pipe Fish Screen Guidelines*, DFO 1995;
 - (x) Fisheries and Oceans Policy for the *Management of Fish Habitat* 1986;
 - (xi) Federal Policy on Wetland Conservation 1991;
 - (xii) Navigable Waters Best Practices; and
 - (xiii) Any other applicable Acts, Regulations, and By-laws.
- (b) Provincial
- (i) The Dangerous Goods Handling and Transportation Act, D12;
 - (ii) The Endangered Species Act, c.E111;
 - (iii) The Environment Act, c.E125;
 - (iv) The Fire Prevention Act, c.F80;
 - (v) The Heritage Resources Act, c.H39.1;
 - (vi) The Noxious Weeds Act , c.N110;
 - (vii) The Nuisance Act, c.N120;
 - (viii) The Pesticides Regulation, M.R. 94/88R
 - (ix) The Public Health Act, c.P210;
 - (x) The Water Protection Act, c.W65;
 - (xi) The Workplace Safety and Health Act c.W210;
 - (xii) Current applicable Associated Regulations;
 - (xiii) The Manitoba Stream Crossing Guidelines for the *Protection of Fish and Fish Habitat, Manitoba National Resources*, 1996.; and
 - (xiv) Any other applicable Acts, Regulations, and By-laws.
- (c) Municipal
- (i) The City of Winnipeg Neighbourhood Liveability By-law No. 1/2008;
 - (ii) The City of Winnipeg By-law No. 1573/77 and all amendments up to and including 7670/2000;
 - (iii) City of Winnipeg *Best Management Practices for Activities In and Around the City's Waterways and Watercourses*, City of Winnipeg 2005;
 - (iv) The City of Winnipeg *Motor Vehicle Noise Policies and Guidelines*;
 - (v) The City of Winnipeg By-law No. 2480/79 and all amendments up to and including 7976/2000;
 - (vi) The City of Winnipeg By-law No. 92/2010; and
 - (vii) Any other applicable Acts, Regulations, and By-laws.
- D29.3 City of Winnipeg Waterways permit is currently underway for this Project. The permit shall be provided to the Contractor when it is formally issued. The Contractor shall comply with the requirements outlined in the permit.
- D29.4 The Contractor is advised that the following environmental protection measures apply to the Work.
- (a) Materials Handling and Storage
- (i) Storage on construction materials shall be confined to the defined laydown areas as shown on the Contract Drawings or at a location approved by the Contract Administrator.

- (ii) Construction materials shall not be deposited or stored on or near watercourses unless written acceptance from the Contract Administrator is received in advance.
 - (iii) Construction materials and debris shall be tied down or secured if severe weather and high wind velocities are forecasted. Work shall be suspended during extreme high wind conditions.
 - (iv) Construction materials and debris shall be prevented from entering watercourses. In the event that materials and/or debris inadvertently enter the land drainage system, the Contractor will be required to remove the material to an appropriate landfill or storage facility and restore the watercourse to its original condition.
- (b) Fuel Handling and Storage
- (i) The Contractor shall obtain all necessary permits from Manitoba Conservation and Water Stewardship for the handling and storage of fuel products and shall provide copies to the Contract Administrator.
 - (ii) All fuel handling and storage facilities shall comply with The Dangerous Goods and Transportation Act Storage and Handling of Petroleum Products Regulation and any local land use permits.
 - (iii) Fuels, lubricants, and other potentially hazardous materials as defined in The Dangerous Goods and Transportation Act shall be stored and handled within the approved storage areas.
 - (iv) The Contractor shall ensure that any temporary fuel storage areas established for construction of the project are contained by an impermeable dyke. Dykes shall be designed, constructed, and maintained to retain not less than 100% of the capacity of the total number of containers or 110% of the largest container, whichever is greatest. The dykes shall be constructed of clay or similar impervious material. If this type of material is not available, the dyke shall be constructed of locally available material and lined with high-density polyethylene (HDPE). Furthermore, the fuel storage area(s) shall be secured by a barrier such as a high fence and gate to prevent vandalism.
 - (v) The Contractor shall ensure that all fuel storage containers are inspected daily for leaks and spillage.
 - (vi) Products transferred from the fuel storage area(s) to specific Work Sites shall not exceed the daily usage requirement.
 - (vii) When servicing requires the drainage or pumping of fuels, lubricating oils or other fluids from equipment, a groundsheet of suitable material (such as HDPE) and size shall be spread on the ground to catch the fluid in the event of a leak or spill.
 - (viii) Washing, refuelling, and servicing of machinery and storage of fuel and other materials for the machinery shall take place at least 100 metres from a watercourse to prevent deleterious substances from entering the water unless otherwise approved by the Contract Administrator.
 - (ix) The area around storage sites and fuel lines shall be distinctly marked and kept clear of snow and debris to allow for routine inspection and leak detection.
 - (x) The deposit of deleterious substances into water frequented by fish is prohibited under the Fisheries Act, 1985. The Contractor shall take appropriate precautions to ensure that potentially deleterious substances (such as fuel, hydraulic fluids, oil, sediment, etc.) do not enter any water body.
 - (xi) A sufficient supply of materials, such as absorbent material and plastic oil booms, to clean up minor spills shall be stored nearby on Site. The Contractor shall ensure that additional material can be made available on short notice.
 - (xii) Machinery shall arrive on Site in a clean condition and shall be maintained to be free to fluid leaks.
 - (xiii) A sufficient supply of materials, such as absorbent material and plastic oil booms, to clean up minor spills shall be stored nearby on Site. The Contractor shall ensure that additional material can be made available upon short notice. Additionally, appropriate staff on Site shall be trained for proper handling of deleterious liquids (i.e. fueling) and trained in preventing and cleaning up minor spills.

- (c) Waste Handling and Disposal
- (i) The construction area shall be kept clean and orderly at all times during and at completion of construction.
 - (ii) At no time during construction shall personal or construction waste be permitted to accumulate for more than one day at any location on the construction Site, other than at a dedicated storage area as may be approved by the Contract Administrator.
 - (iii) The Contractor shall, during and at the completion of construction, clean-up the construction area and all resulting debris shall be deposited at a Waste Disposal Ground operating under the authority of Manitoba Regulation 150/91. Exceptions are liquid industrial and hazardous wastes which require special disposal methods (refer to Section 30.5D).
 - (iv) On Site volumes of sewage and/or septage will be removed on a weekly basis.
 - (v) The Contractor shall ensure sewage, septage, and other liquid wastes generated on Site are handled and disposed of by a certified disposal contractor.
 - (vi) Indiscriminate dumping, littering, or abandonment shall not take place.
 - (vii) No on-Site burning of waste is permitted.
 - (viii) Structurally unsuitable site excavation material will be removed by the Contractor.
 - (ix) Waste storage areas shall not be located so as to block natural drainage.
 - (x) Runoff from a waste storage area shall not be allowed to cause siltation of a watercourse.
 - (xi) Waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.
 - (xii) Equipment shall not be cleaned near watercourses; contaminated water from onshore cleaning operations shall not be permitted to enter watercourses.
 - (xiii) The Contractor shall notify and receive written approval from the Contract Administrator prior to discharge from any dewatered areas. The discharge will be released into a well-vegetated area, filter bag, settling basin, or storm sewer system to remove the suspended material and other deleterious substances from the discharge before it finds its way into any watercourse. Discharge from dewatering areas may require approved disposal via the sanitary sewer system or disposal truck in accordance with Construction Specifications, at the request of the Contract Administrator.
 - (xiv) Flows will be dissipated so that dewatering discharges minimize erosion at the discharge point.
- (d) Dangerous Goods/Hazardous Waste Handling and Disposal
- (i) Dangerous goods/hazardous waste are identified by, and shall be handled according to, The Dangerous Goods Handling and Transportation Act and Regulations.
 - (ii) The Contractor shall be familiar with The Dangerous Goods Handling and Transportation Act and Regulations.
 - (iii) The Contractor shall have on Site staff that is trained and certified in the handling of the dangerous/hazardous goods, when said dangerous/hazardous goods are being utilized on Site for the performance of the Work.
 - (iv) Different waste streams shall not be mixed.
 - (v) Disposal of dangerous goods/hazardous wastes shall be at approved hazardous waste facilities.
 - (vi) Liquid hydrocarbons shall not be stored or disposed of in earthen pits on Site.
 - (vii) Used oils shall be stored in appropriate drums or tankage until shipment to waste oil recycling centres, incinerators, or secure disposal facilities approved for such wastes.
 - (viii) Used oil filters shall be drained, placed in suitable storage containers, and buried or incinerated at approved hazardous waste treatment and disposal facilities.

- (ix) Dangerous goods/hazardous waste storage areas shall be located at least 107 metres away from the edge of the water line for normal summer water levels and be dyked.
 - (x) Dangerous goods/hazardous waste storage areas shall not be located so as to block natural drainage.
 - (xi) Runoff from a dangerous goods/hazardous waste storage areas shall not be allowed to cause siltation of a watercourse.
 - (xii) Dangerous goods/hazardous waste storage areas shall be left in a neat and finished appearance and/or restored to their original condition to the satisfaction of the Contract Administrator.
- (e) Emergency Response
- (i) The Contractor shall ensure that due care and caution is taken to prevent spills.
 - (ii) The Contractor shall report all major spills of petroleum products or other hazardous substances with significant impact on the environment and threat to human health and safety (as defined in Table 1 below) to Manitoba Environment, immediately after occurrence of the environmental accident, by calling the 24-hour emergency phone number (204) 945-4888.
 - (iii) The Contractor shall designate a qualified supervisor as the on-Site emergency response coordinator for the project. The emergency response coordinator shall have the authority to redirect manpower in order to respond in the event of a spill.
 - (iv) The following actions shall be taken by the person in charge of the spilled material or the first person(s) arriving at the scene of a hazardous material accident or the on-site emergency response coordinator:
 - (i) Notify emergency-response coordinator of the accident:
 - Identify exact location and time of accident;
 - Indicate injuries, if any;
 - Request assistance as required by magnitude of accident (Manitoba Environment 24-hour Spill Response Line (204) 945-4888, Police, Fire Department, Ambulance, company backup).
 - (ii) Attend to public safety:
 - Stop traffic, roadblock/cordon off the immediate danger area;
 - Eliminate ignition sources;
 - Initiate evacuation procedures if necessary.
 - (iii) Assess situation and gather information on the status of the situation, noting:
 - Personnel on Site;
 - Cause and effect of spill;
 - Estimated extent of damage;
 - Amount and type of material involved; and
 - Proximity to waterways, sewers, and manholes.
 - (iv) If safe to do so, try to stop the dispersion or flow of spill material
 - Approach from upwind;
 - Stop or reduce leak if safe to do so;
 - Dyke spill material with dry, inert absorbent material or dry clay soil or sand;
 - Prevent spill material from entering waterways and utilities by dyking;
 - Prevent spill material from entering manholes and other openings by covering with rubber spill mats or dyking; and
 - Resume any effective action to contain, clean up, or stop the flow of the spilled product.

- (v) The emergency response coordinator shall ensure that all environmental accidents involving contaminants shall be documented and reported to Manitoba Environment according to The Dangerous goods Handling and Transportation Act Environmental Accident Report Regulation 439/87.
- (vi) When dangerous goods are used on Site, materials for containment and cleanup of spill material (e.g. absorbent materials, plastic oil booms, and oversized recovery drums) shall be available on Site.
- (vii) Minor spills of such substances that may be contained on land with no significant impact on the environment may be responded to within-house resources without formal notification to Manitoba Environment.
- (viii) City Emergency response, 9-1-1, shall be used if other means are not available.

TABLE 1 SPILLS THAT MUST BE REPORTED TO THE MANITOBA CONSERVATION AS ENVIRONMENTAL ACCIDENTS		
Classification	Hazard	Reportable quantity/level
1	Explosives	All
2.1	Compressed Gas (Flammable)	100 L*
2.2	Compressed Gas	100 L*
2.3	Compressed Gas (Toxic)	All
2.4	Compressed Gas (Corrosive)	All
3	Flammable Liquids	100 L
4	Flammable Solids	1 Kg
5.1 PG** I & II	Oxidizer	K kg or 1 L
PG** III	Oxidizer	50 kg or 50 L
5.2	Organic Peroxide	1 kg or 1 L
6.1 PG** I & II	Acute Toxic	1 kg or 1 L
PG** III	Acute Toxic	5 kg or 5 L
6.2	Infectious	All
7	Radioactive	Any discharge or radiation level exceeding 10 mSv/h at the package surface and 200 uSv/h at 1 m from the package surface
8	Corrosive	5 kg or 5 L
9.1	Miscellaneous (except PCB mixtures)	50 kg
9.2	PCB Mixtures	500 g
9.3	Aquatic Toxic	1 kg or 1 L
9.4	Wastes (chronic toxic)	5 kg or 5 L
* Container capacity (refers to container water capacity)		
** PG = Packing Group(s)		

- (f) Noise and Vibration
 - (i) Noise-generating activities shall be limited to the hours indicated in the City of Winnipeg Noise Bylaw, unless otherwise accepted in advance by the Contract Administrator. The activities will generally be restricted to 7:00 a.m. to 9:00 p.m. weekdays with written permission of the Contract Administrator and the City of Winnipeg for any afterhours or weekend work required for special cases.
 - (ii) The Contractor shall be responsible for scheduling Work to avoid potential noise problems and/or employ noise reduction measures to reduce noise to acceptable limits. The Contractor shall also demonstrate to the Contract Administrator that Works to be performed during the night-time period, on Sundays, and Holidays shall not exceed the approved limit.
 - (iii) The Contractor shall locate stationary noise generating equipment (i.e. generators) away from sensitive receptors and wildlife areas.

- (iv) Construction vehicles and equipment will adhere to posted speed limits.
- (g) Dust and Emissions
 - (i) Dust control practices implemented by the Contractor during construction shall include regular street cleaning and dampening of construction access roads and Work areas with water or approved chemicals at an adequate frequency to prevent the creation of dust.
 - (ii) The Contractor shall minimize construction equipment idling times and turn off machinery, when feasible.
 - (iii) Dust control practices implemented by the Contractor during construction will include regular street cleaning and dampening of construction access roads and Work areas with water or approved chemicals at an adequate frequency to prevent the creation of dust.
 - (iv) Only water or chemicals approved by the Contract Administrator shall be used for dust control. The use of waste petroleum or petroleum by-products is not permitted.
 - (v) The Contractor shall ensure that trucks which are used to haul excavated material and backfill material to and from the Work Site utilize tarpaulin covers during transport to prevent material from falling onto the street and creating dust.
 - (vi) Stockpiled soils shall be covered with tarpaulin covers to prevent the creation of dust.
- (h) Erosion Control
 - (i) The Contractor shall develop a sediment control plan prior to beginning construction in adherence to the Transportation Association of Canada National Guide to Erosion and Sediment Control on Roadway Projects, the City of Winnipeg's *Best Management Practices for Activities In and Around the City's Waterways and Watercourses*, and to the satisfaction of the Contract Administrator.
 - (ii) Exposure of soils shall be kept to a minimum practical amount, acceptable to the Contract Administrator. The cover of trees and undergrowth shall be preserved to the maximum extent possible.
 - (iii) Sediment control fencing, or other such erosion control structures, shall be employed wherever construction activity increases the potential for runoff to carry sediment into a drainage channel or other watercourse. The Contractor shall inspect all such structures daily during heavy construction activity in the areas of the structures and after a heavy rainfall to ensure their continued integrity.
 - (iv) All areas disturbed during construction shall be landscaped and revegetated with native and/or introduced plant species in order to restore and enhance the Site and to protect against soil erosion unless otherwise indicated.
 - (v) The disturbed surface shall be revegetated so as to create a dense root system in order to defend against soil erosion on the right-of-way and any other disturbed areas susceptible to erosion.
 - (vi) The loss of topsoil and the creation of excessive dust by wind during construction shall be prevented by the addition of temporary cover crop, water, or tackifier, if conditions so warrant.
 - (vii) The Contractor shall routinely inspect all erosion and sediment control structures and immediately carry out any necessary maintenance. Several inspections will be performed during rainy days.
 - (viii) Construction activities will be avoided during periods of high winds to prevent erosion and the creation of dust.
- (i) Runoff Control
 - (i) Measures shall be undertaken to ensure that runoff containing suspended soil particles is minimized from entering the land drainage system and the watercourse to the greatest extent possible, to the satisfaction of the Contract Administrator.
 - (ii) Areas that are heavily disturbed and vulnerable to erosion or gulying will be dyked to redirect surface runoff around the area prior to spring runoff.

- (iii) Construction activities on erodible slopes shall be avoided during spring runoff and heavy rain fall events.
- (iv) Soil and fill shall not be stockpiled on immediate watercourse bank areas. Stockpile locations shall be presented for review and approval to the Contract Administrator.
- (j) Fish
 - (i) **Due to the presence of spawning fish species no instream works will occur between April 1 and June 15 of any given year.**
 - (ii) If the creation of any isolated areas is required for the performance of the work a fish trapped within the isolated area will be captured and returned to the watercourse unharmed. Fish includes fin fish, crayfish, and mussels (clams).
 - (iii) A buffer of vegetation will be maintained when working along waterways, where possible.
 - (iv) The duration of Work and amount of disturbance to the bed and banks of the waterbody will be minimized.
- (k) Wildlife
 - (i) No clearing of trees, shrubs, or vegetation is permitted between May 1 and July 31 of any year to protect the nesting and breeding season for migratory birds and other wildlife, unless otherwise identified by a Project biologist.
 - (ii) No disruption, movement, or destruction shall occur to any migratory bird nests.
 - (iii) In the event that a species at risk or a nest is encountered during construction, all Work will cease in the immediate area, the site will be made safe, and the Contract Administrator shall be contacted for further direction.
- (l) Vegetation
 - (i) Vegetation shall not be disturbed without written permission from the Contract Administrator.
 - (ii) The Contractor shall protect plants or trees which may be at risk of accidental damage. Such measures may include protective fencing or signage and shall be approved in advance by the Contract Administrator.
 - (iii) The Contractor will limit the removal of trees and snags (standing dead trees), surface disturbance, and vegetation clearing.
 - (iv) Herbicides and pesticides shall not be used adjacent to any surface watercourses.
 - (v) Trees or shrubs shall not be felled into watercourses.
 - (vi) Areas where vegetation is removed during clearing, construction, and decommissioning activities, shall be revegetated as soon as possible in accordance with the landscaping plans forming part of the contract, or as directed by the Contract Administrator.
 - (vii) Trees damaged during construction activities shall be examined by bonded tree care professionals; viable trees damaged during construction activities shall be pruned according to good practice by bonded tree care professionals.
 - (viii) Damaged trees which are not viable shall be replaced at the expense of the Contractor.
- (m) Landscaping
 - (i) Construction waste (excluding common construction gravel, sand etc.) shall be removed to a minimum depth of 600 mm below final grade in all areas that are to be backfilled with suitable material and revegetated in accordance with Standard City Practice.
 - (ii) The Contractor shall adhere to the landscaping plan for maintenance of initial stage and development stages of the plant community
- (n) Construction Traffic
 - (i) Workforce parking shall be limited to the areas designated for such as detailed in the Contract Documents, or as otherwise may be directed by the Contract Administrator.

- (ii) The Contractor shall adhere to the Standard Provisions of the Standard Construction Specifications, and of the Manual of Temporary Traffic Control in Work Areas on City Streets of The City of Winnipeg, Works & Operations Division.
- (iii) The Contractor's laydown area, construction Site and access road shall be fenced and gated to secure the Site and materials and to discourage pedestrian entrance to construction area and to control any potential hazard to the public, particularly children.
- (iv) For circumstances where the Contract Administrator has accepted Site access of special equipment or material, the Contractor shall provide adequate flagmen for traffic control in the vicinity of any public buildings.
- (o) Access
 - (i) The Contractor shall maintain access to affected residential properties.
- (p) The Contractor shall provide or maintain general and off-street access to any affected business during construction.

D30. PROTECTION OF HERITAGE RESOURCES

- D30.1 The Contractor shall inform the Contract Administrator of any materials, items or conditions discovered during the course of the Work that could be of historical or archaeological significance.
- D30.2 The Contractor is advised that there may be temporary delays in construction to provide the Archaeologist an opportunity to evaluate and document conditions of possible archaeological significance. In this event, every effort shall be taken to minimize the impacts on the Contractor's operations.
- D30.3 The Contractor shall cooperate fully with the Contract Administrator and the Archaeologist by promptly reporting any unusual conditions encountered during construction and assisting in the evaluation and documentation of archaeological information.

WARRANTY

D31. WARRANTY

- D31.1 Notwithstanding C13.2, the warranty period shall begin on the date of Total Performance and shall expire one (1) year thereafter, except where longer warranty periods are specified in the respective Specification sections, unless extended pursuant to C13.2.1 or C13.2.2, in which case it shall expire when provided for thereunder.
- D31.2 Notwithstanding C13.2, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.
 - D31.2.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

FORM H1: PERFORMANCE BOND
(See D11)

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

_____ dollars (\$_____)

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

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

BID OPPORTUNITY NO. 721-2016

Lyndale Drive – Monck Avenue to Gauvin Street, Riverbank Stabilization and Associated Works which is by reference made part hereof and is hereinafter referred to as the "Contract".

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

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

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

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

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

_____ day of _____, 20____.

SIGNED AND SEALED
in the presence of:

(Witness as to Principal if no seal)

(Name of Principal)

Per: _____ (Seal)

Per: _____

(Name of Surety)

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

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

(Date)

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

RE: PERFORMANCE SECURITY – BID OPPORTUNITY NO. 721-2016

Lyndale Drive – Monck Avenue to Gauvin Street, Riverbank Stabilization and Associated Works

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 (2007 Revision), International Chamber of Commerce Publication Number 600.

(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

FORM K: EQUIPMENT
(See D13)

Lyndale Drive – Monck Avenue to Gauvin Street, Riverbank Stabilization and Associated Works

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

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

E1.1 These Specifications shall apply to the Work.

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

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

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

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

E1.3 The following are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
RW751-2016-0	Cover Sheet and Location Plan	A1
RW751-2016-1	Existing Conditions Sta 0+055 to Sta 0+170	A1
RW751-2016-2	Existing Conditions Sta 0+170 to Sta 0+290	A1
RW751-2016-3	Existing Conditions Sta 0+290 to Sta 0+400	A1
RW751-2016-4	Existing Conditions Sta 0+400 to Sta 0+510	A1
RW751-2016-5	Existing Conditions Sta 0+510 to Sta 0+610	A1
RW751-2016-6	Existing Conditions Sta 0+610 to Sta 0+720	A1
RW751-2016-7	Riverbank Stabilization Temporary Access and Work Platform	A1
RW751-2016-8	Riverbank Stabilization Work Platform Layout and Profiles	A1
RW751-2016-9	Riverbank Stabilization Riverbank Stabilization Works General Layout	A1
RW751-2016-10	Riverbank Stabilization Riverbank Stabilization Plan and Sections	A1
RW751-2016-11	Riverbank Stabilization Riverbank Stabilization Plan and Sections	A1
RW751-2016-12	Riverbank Stabilization Riverbank Stabilization Plan and Sections	A1
RW751-2016-13	Riverbank Stabilization Riverbank Stabilization Plan and Sections	A1
RW751-2016-14	Riverbank Grading and Trail Sta 0+055 to Sta 0+170	A1
RW751-2016-15	Riverbank Grading and Trail Sta 0+170 to Sta 0+290	A1
RW751-2016-16	Riverbank Grading and Trail Sta 0+290 to Sta 0+400	A1

<u>Drawing No.</u>	<u>Drawing Name/Title</u>	<u>Drawing (Original) Sheet Size</u>
RW751-2016-17	Riverbank Grading and Trail Sta 0+400 to Sta 0+510	A1
RW751-2016-18	Riverbank Grading and Trail Sta 0+510 to Sta 0+610	A1
RW751-2016-19	Riverbank Grading and Trail Sta 0+610 to Sta 0+720	A1
RW751-2016-20	Riverbank Grading Wall Demolition Cross Sections	A1
RW751-2016-21	Riverbank Grading Site Restoration Details 1	A1
RW751-2016-22	Riverbank Grading Site Restoration Details 2	A1
RW751-2016-23	Roadworks Horizontal Geometry Sta 0+055 to Sta 0+290	A1
RW751-2016-24	Roadworks Horizontal Geometry Sta 0+290 to Sta 0+510	A1
RW751-2016-25	Roadworks Horizontal Geometry Sta 0+510 to Sta 0+720	A1
RW751-2016-26	Roadworks Horizontal and Vertical Alignment Gravel Sidewalk	A1
RW751-2016-27	Roadworks Horizontal and Vertical Alignment Sta 0+055 to Sta 0+170	A1
RW751-2016-28	Roadworks Horizontal and Vertical Alignment Sta 0+170 to Sta 0+290	A1
RW751-2016-29	Roadworks Horizontal and Vertical Alignment Sta 0+290 to Sta 0+400	A1
RW751-2016-30	Roadworks Horizontal and Vertical Alignment Sta 0+400 to Sta 0+510	A1
RW751-2016-31	Roadworks Horizontal and Vertical Alignment Sta 0+510 to Sta 0+610	A1
RW751-2016-32	Roadworks Horizontal and Vertical Alignment Sta 0+610 to Sta 0+720	A1

E2. GEOTECHNICAL REPORT

E2.1 Further to C3.1, the geotechnical reports are provided to aid the Contractor's evaluation of the pavement structure and existing soil conditions. The geotechnical reports are contained in Appendix 'A'.

E3. OFFICE FACILITIES

E3.1 The Contractor shall supply office facilities meeting the following requirements:

- (a) The field office shall be for the exclusive use of the Contract Administrator.
- (b) The building shall be conveniently located near the site of the Work.
- (c) The building shall have a minimum floor area of 20 square metres, a height of 2.4 m with two (2) windows for cross ventilation and a door entrance with a suitable lock.
- (d) The building shall be suitable for all weather use. It shall be equipped with an electric heater and air conditioner so that the room temperature can be maintained between either 16-18°C or 24-25°C.
- (e) The building shall be adequately lighted with fluorescent fixtures and have a minimum of three wall outlets.

- (f) The building shall be furnished with one desk, table 3m x 1.2m, one four drawer legal size filing cabinet and a minimum of 8 chairs.
- (g) A portable toilet shall be located near the field office building. The toilet shall have a locking door and be for the exclusive use of the Contract Administrator and other personnel from the City.
- (h) The field office building and the portable toilet shall be cleaned on a weekly basis immediately prior to each site meeting. The Contract Administrator may request additional cleaning when he/she deems it necessary.

E3.2 The Contractor shall be responsible for all installation and removal costs, all operating costs, and the general maintenance of the office facilities.

E3.3 The office facilities will be provided from the date of the commencement of the Work to the date of Total Performance.

E4. RIVERBANK INSTRUMENTATION

E4.1 The Contractor is advised that geotechnical instrumentation (slope inclinometers and piezometers) have been installed in Test Hole TH-13-01 to TH-13-09 at the locations shown on the Drawings. During the course of the Work, the Contract Administrator may have additional instrumentation installed to monitor riverbank performance.

E4.2 The Contractor shall take necessary precautions to prevent damage to the existing or any newly installed geotechnical instrumentation as a result of their Work.

- (a) Existing instrumentation installed within TH13-07 and TH13-09 will be abandoned (by others).

E4.3 The Contractor shall facilitate any work by others necessary to modify existing instrumentation, to maintain operation of the instrumentation or to install new instrumentation.

E4.4 The Contractor shall repair or replace instrumentation damaged as a result of his Work at no cost to the City.

E4.5 The Contractor is advised that monitoring of geotechnical instrumentation will be undertaken by the Contract Administrator during construction. Every effort will be made to schedule monitoring to avoid interruptions of the Contractor's work activities, however it may be necessary to temporarily suspend operation of equipment to reduce ground vibrations during monitoring.

E5. WATERWAY BY-LAW AND PERMITS

E5.1 The Contractor shall note that all Works fall within 107 metres (350 feet) of the regulated summer water level of the Red River and are therefore within the jurisdiction of the Waterway By-Law. The Contract Administrator will apply and pay for the required Waterway Permits for the Work. The Contractor shall make himself aware of and adhere to all conditions imposed by the permit.

E5.2 Under no circumstances will stockpiling of any material be permitted within 107 metres of the regulated summer water level of the Red River without the approval of the Contract Administrator.

E6. PROTECTION OF EXISTING TREES

E6.1 Tree protection measures shall be implemented at the start of construction and remain in place for the duration of construction unless otherwise authorized by the Contract Administrator.

E6.2 The Contractor shall take the following precautionary steps to prevent damage from construction activities to existing boulevard trees and riverbank trees within the limits of the construction area:

- (a) The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards or riverbanks within 2 metres of trees.
- (b) Trees identified to be at risk by the Contract Administrator are to be wrapped with a layer of burlap and steel wire and strapped with 19 x 140 x 2400mm wood planks, or suitably protected as approved by the Contract Administrator.
- (c) For large street trees and trees on private property adjacent to the construction limits, create a 1200 mm height HDPE snow fence buffer, colour orange, approximately in line with the overhead canopy for deciduous trees, and one metre beyond the widest branch diameter for coniferous trees. Obtain Contract Administrator approval of fence alignment.
- (d) Excavation shall be performed in a manner that minimizes damage to the existing root systems. Where possible, excavation shall be carried out such that the edge of the excavation shall be a minimum of 1.5 times the diameter (measured in inches), with the outcome read in feet, from the closest edge of the trunk. Where roots must be cut to facilitate excavation, they shall be pruned neatly at the face of excavation.
- (e) Operation of equipment within the dripline of the trees shall be kept to the minimum required to perform the work required. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.
- (f) Work on-site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to branches does occur, they shall be neatly pruned.

E6.3 All damage to existing trees caused by the Contractor's activities shall be repaired to the requirements and satisfaction of the Contract Administrator and the City Forester or his/her designate.

E6.4 No separate measurement or payment will be made for the protection of trees.

E6.5 Except as required in clause E6.2(d) and E6.2(f), Elm trees shall not be pruned at any time between April 1 and July 31.

E7. TRAFFIC CONTROL

E7.1 Further to clauses 3.6, 3.7 and 3.8 of CW 1130:

- (a) Where directed by the Contract Administrator, the Contractor shall construct and maintain temporary asphalt ramps to alleviate vertical pavement obstructions such as manholes and planing drop-offs to the satisfaction of the Contract Administrator. Payment shall be in accordance with CW3410.
- (b) In accordance with the Manual of Temporary Traffic Control on City Streets (MTTC), the Contractor ("Construction Agency" in the manual) shall be responsible for placing, maintaining and removing the appropriate temporary traffic control devices as specified by the MTTC or by the Traffic Management Branch of the City of Winnipeg Public Works Department. The Contractor shall bear all costs associated with the placement of temporary traffic control devices by their own forces or subcontractor.

E7.2 Notwithstanding E7.1, in accordance with the MTTC, the Contract Administrator shall make arrangements with the **Traffic Services Branch of the City of Winnipeg** to place, maintain, and remove all **regulatory signs** and traffic control devices authorized and/or required by the Traffic Management Branch in the following situations:

- (a) Parking restrictions,
- (b) Stopping restrictions,
- (c) Turn restrictions,
- (d) Diamond lane removal,

- (e) Full or directional closures on a Regional Street,
- (f) Traffic routed across a median,
- (g) Full or directional closure of a non-regional street where there is a requirement for regulatory signs (turn restrictions, bus stop relocations, etc.) to implement the closure.
- (h) Approved Designated Construction Zones with a temporary posted speed limit reduction. Traffic Services will be responsible for placing all of the advance signs and 'Construction Ends' (TC-4) signs. The Contractor is still responsible for all other temporary traffic control including but not limited to barricades, barrels and tall cones.

E7.2.1 An exception to E7.2 is the 'KEEP RIGHT/KEEP LEFT' sign (RB-25 / RB-25L) which shall be supplied, installed, and maintained by the Contractor at their own expense.

E7.2.2 Further to E7.2, where the Contract Administrator has determined that the services of the Traffic Services Branch are required, the City shall bear the costs associated with the placement of temporary traffic control devices by the Traffic Services Branch of the City of Winnipeg in connection with the works undertaken by the Contractor.

E8. TRAFFIC MANAGEMENT

E8.1 Further to clause 3.7 of CW 1130:

E8.1.1 Lyndale Drive will be closed to all traffic between, but not including, Monck Avenue and Gauvin Street. The Contractor shall sign the street "Road Closed" in accordance with the Manual of Temporary Traffic Control.

E8.1.2 The Contractor shall maintain access for the residents of 539 Lyndale Drive from Avenue Tache at all times during construction.

E8.1.3 The Contractor shall maintain access for the residents of 652 and 654 Lyndale Drive at all times during construction.

E8.1.4 Should the contractor be unable to maintain pedestrian or vehicular access to a residence or business, he/she shall review the planned disruption with the business or residence and the Contract Administrator, and take reasonable measures to minimize the impact. The Contractor shall provide a minimum of 24 hours notification to the affected residence or business and the Contract Administrator, prior to disruption of access.

E8.1.5 Pedestrian and ambulance/emergency vehicle access must be maintained at all times.

E8.1.6 Traffic management will be considered incidental to Mobilization and Demobilization and no additional measurement payments will be made for work described in this specification.

E9. REFUSE AND RECYCLING COLLECTION

E9.1 While access to refuse and/or recycling collection vehicles is restricted, on collection day(s) the Contractor shall move all of the affected property owners refuse and/or recycling materials to a nearby common area, prior to an established time, in accordance with E9.2 to permit the normal collection vehicles to collect the materials. Immediately following recycling collection the Contractor shall return recycling receptacles to the addresses marked on the receptacles.

E9.2 Collection Schedule for Lyndale Drive is Tuesday (B).

E9.3 No measurement or payment will be made for the work associated with this specification.

E10. PEDESTRIAN SAFETY

E10.1 The pedestrian sidewalk (existing gravel path) along the south side of Lyndale Drive shall be closed during construction in accordance with the Manual of Temporary Traffic Control. Signage shall be installed directing pedestrians to use the north side of Lyndale Drive. A minimum 2.0 m

wide pedestrian corridor shall be designated in accordance with the Manual of Temporary Traffic Control along the north gutter line of Lyndale Drive as shown on the Drawings.

- E10.1.1 The pedestrian corridor described in E10.1 shall be cleared of snow by the Contractor when required.
- E10.1.2 Due to the Manitoba Marathon on Sunday, June 18, 2017, the existing 10 m wide pavement surface of Lyndale Drive shall be open to pedestrians on that weekend free of barricades. Pedestrians shall be protected from any riverbank grading work on the south side of Lyndale Drive using fencing. The existing 10 m roadway shall be cleared of any debris, materials and equipment and swept for this event.
- E10.1.3 Once the base course has been installed for the proposed sidewalk on the south side of Lyndale Drive, pedestrians shall be directed to use this area while the north side of Lyndale Drive is being constructed.
- E10.1.4 Once the pavement of Lyndale Drive is complete, a minimum 2.0 m wide pedestrian corridor shall be re-established on the north side of Lyndale Drive (complete with necessary signage) while paving of the sidewalk along the south side of Lyndale Drive is completed.
- E10.2 During the project, a temporary snow fence shall be installed and maintained around any excavations, steep drop-offs, access ramps or other conditions hazardous to pedestrians.
- E10.3 A fence and appropriate signs shall be placed as required for pedestrian safety, as deemed by the Contract Administrator, during non- working hours to discourage public access to the Site.
- E10.4 Pedestrian safety will be considered incidental to Mobilization and Demobilization and no additional measurement or payment will be made for work described in this specification.

E11. WATER OBTAINED FROM THE CITY

- E11.1 Further to clause 3.7 of CW 1120, the Contractor shall pay for all costs, including sewer charges, associated with obtaining water from the City in accordance with the Waterworks and Sewer By-laws.

E12. SURFACE RESTORATIONS

- E12.1 Further to clause 3.3 of CW 1130, when Total Performance is not achieved in the year the Contract is commenced, the Contractor shall temporarily repair any Work commenced and not completed to the satisfaction of the Contract Administrator. The Contractor shall maintain the temporary repairs in a safe condition as determined by the Contract Administrator until permanent repairs are completed. The Contractor shall bear all costs associated with temporary repairs and their maintenance.

E13. MOBILIZATION AND DEMOBILIZATION

- E13.1 Description
 - E13.1.1 This Specification shall cover all operations relating to the mobilization and demobilization of the contractor to the site, as specified herein
 - E13.1.2 The Work to be done by the Contractor under this specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all things necessary for and incidental to the satisfactory performance and completion of all works as hereinafter specified.
- E13.2 Materials
 - E13.2.1 The Contractor shall be responsible for the supply, safe storage and handling of all materials as set forth in this specification.

E13.3 Construction Methods

- E13.3.1 The Contractor shall obtain written permission from private property owners for any use of private property. A copy of written permission shall be provided to the Contract Administrator prior us of the property in question.
- E13.3.2 The Contractor's Site supervisor is required to carry at all times a cellular telephone, with voice mail.
- E13.3.3 This section also includes travel and accommodation, set-up and demobilization of site offices, storage conveniences and other temporary facilities, construction plant, and other items not required to form part of the permanent works and not covered by other prices.

E13.4 Measurement and Payment

- E13.4.1 Mobilization and demobilization will be paid for on a Lump Sum basis under "Mobilization and Demobilization," which price will 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 and accepted by the Contract Administrator.
- E13.4.2 Mobilization and demobilization will be paid for at a percentage of the Contract Lump Sum Price for "Mobilization and Demobilization" specified as follows:
- (a) 50% when the Contract Administrator is satisfied that construction has commenced;
 - (b) 40% when Substantial Performance has been met;
 - (c) 10% when Total Performance has been met.

E14. WORKING PLATFORM AND TEMPORARY ACCESS

E14.1 Description

E14.2 The specification shall cover the following Site development items:

- (a) Construction of temporary access ramp(s) to the work area(s);
- (b) Construction of the working platform to facilitate the installation of rockfill columns and riprap, as shown on the Drawings;
- (c) Removal of temporary access ramp(s) and working platform, including reshaping to original riverbank geometry.

E14.3 The work to be done 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 hereinafter specified.

E14.4 This specification shall supplement CW 3170.

E14.5 The Contractor shall be responsible to develop and maintain Site Access.

E14.6 Submittals

E14.6.1 Site Access Plan

- (a) At least five (5) days prior to commencement of construction, the Contractor shall submit a Site Access Plan for approval by the Contract Administrator to facilitate installation of riverbank stabilization works (rockfill columns and riprap). The Site Access Plan shall be sufficient to satisfy the Contract Administrator that the proposed access ramps and working platform will be in accordance with this Specification and will not adversely impact riverbank stability for the duration of the project. Approval of the Site Access Plan shall not diminish the Contractor's responsibility for development and maintenance of site access.
- (b) The Site Access Plan shall include the proposed layout, grades and sequencing of any access ramps from the top of the bank area onto the riverbank and any working platforms. The extent of cuts and fills shall also be clearly identified.

E14.7 Materials

E14.7.1 Fills

- (a) The working platform has been designed to balance cut and fill.
- (b) Access ramp(s) are to be constructed by balance cut and fill.
- (c) The Contractor shall be responsible for supplying additional suitable fill from an off-site source, if required, including any granular surfacing materials for site access ramps and platforms.
- (d) The Contractor shall be responsible for supplying granular surface treatments to the ramps and working platform, or other materials that the Contractor may deem suitable for its operations.

E14.8 Construction Methods

- E14.8.1 Temporary Access ramps shall be located within the Work area and shall not result in a net fill on the riverbank. Potential access ramp locations shown on the Drawings are intended to illustrate a feasible concept, however alternate or additional ramps may be proposed by the Contractor in their Site Access Plan.
- E14.8.2 The Contractor shall construct a level working platform to facilitate installation of the rockfill columns along the riverbank. A pre-approved working platform design is shown on the Drawings that is intended to illustrate a feasible concept and has been designed to achieve a balance of cut and fill. Modifications to the pre-approved design or alternate geometries must be identified in the Site Access Plan and approved by the Contract Administrator. Note that payment for drilling of rockfill columns is based on the working platform elevations shown on the Drawings, and alternate platform elevations shall not affect the measurement of "Drilling of Rockfill Columns".
- E14.8.3 Clearing and grubbing which will include tree and driftwood removal shall be done in accordance with CW 3110.
- E14.8.4 The Contractor shall be responsible for maintaining the access ramps and platform, including placement of granular surface materials, and ensuring that all fills are placed as per the Site Access Plan and remain in a compacted state to support construction equipment during construction.
- E14.8.5 Methods and procedures that prevent damage or risk of damage to existing trees, infrastructure and existing facilities on Site, shall be employed during construction and maintenance of the ramps and platform. This may include installing fencing to identify the edges of the ramps and prevent inadvertent entry of construction equipment into treed areas.
- E14.8.6 Fills shall not be placed for the construction or maintenance of the ramp without prior acceptance by the Contract Administrator.
- E14.8.7 Surplus excavated materials shall be immediately removed from the Site. Stockpiling of excavated materials shall not be permitted unless approved by the Contract Administrator.
- E14.8.8 The Contractor shall remove the access ramp(s) and working platform upon completion of rockfill column and riprap installation by reshaping to the original (pre-construction) riverbank grades shown on the Drawings.
- ### E14.9 Measurement and Payment
- E14.9.1 Constructing, maintaining and removal of the access ramp(s) and working platform will not be measured. This item of work will be paid for at the Contract Lump Sum price for "Construct and Remove Working Platform and Temporary Access", performed in accordance with this Specification and accepted by the Contract Administrator.
- E14.9.2 Supply and placement of any imported fill or granular surfacing materials required for construction or maintenance of the temporary access ramp(s) and working platform shall be considered incidental to the Work.

E15. ROCKFILL COLUMNS

E15.1 This Specification shall cover excavation, backfilling and densification of the Rockfill Columns. The Work to be done 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 hereinafter specified.

E15.2 Materials

E15.2.1 General

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

E15.2.2 Crushed Rockfill

(a) The material used for the rockfill column fill shall be 150 mm down crushed rockfill manufactured from sound durable limestone or dolomite meeting the following properties:

- (i) minimum bulk specific gravity of 2.6 (ASTM C127),
- (ii) maximum Los Angeles abrasion loss of 35% (ASTM C131),
- (iii) maximum soundness loss of 18% (ASTM C88)
- (iv) maximum absorption of 2.5% (ASTM C127),
- (v) gradation requirements, as follows:

Gradation Requirements 150 mm Crushed Rockfill	
Canadian Metric Sieve Size (mm)	Percent of Total Dry Weight Passing Each Sieve
200	100
150	90-100
75	40-75
25	10-30
5	5-12
0.075	0-5

(vi) maximum moisture content of 3 percent by weight (ASTM D2216-98).

E15.2.3 Clay Cap

(a) The clay cap at the top of the rockfill columns shall consist of high plasticity clay material with a liquid limit in excess of 50%. The clay shall be free of deleterious material such as roots, organic material, ice, snow or other unsuitable materials, and may be salvaged from the on-site excavation, as approved by the Contract Administrator. Frozen material will not be accepted.

E15.3 Submittals

E15.3.1 The Contractor shall submit the proposed supplier(s) and location of quarry sites for supply of the crushed rockfill and confirm that sufficient quantity of specified rock is available at least ten (10) business days prior to the commencement of supply of rockfill for rockfill columns.

E15.3.2 The Contractor shall supply a representative sample of 150 mm crushed rockfill at least ten (10) business days prior to the commencement of construction of rockfill columns. The

sample shall be delivered to TREK Geotechnical's laboratory at 1712 St. James Street at the Contractor's own expense.

E15.3.3 The Contractor shall supply representative test results at least ten (10) business days prior to the supply of rockfill to the site, demonstrating that the rockfill material to be supplied shall be of adequate quality and gradation to satisfy the material specification contained herein.

E15.4 Testing and Approval

E15.4.1 All materials set forth in 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 for any materials supplied to the Contract Administrator for testing purposes.

E15.4.2 The Contract Administrator may visit proposed quarry sites for inspection of the proposed crushed rockfill and quarry faces prior to supply and placement of material.

E15.4.3 No supply and placement of crushed rockfill will be permitted prior to the Contract Administrator approving the source.

E15.4.4 The procedures for preparation of all crushed rockfill samples for use in material inspection and testing shall be subject to review and acceptance by the Contract Administrator for individual tests. The samples may be obtained from crushed and processed material at the sizing necessary for specific tests if the material is deemed to be representative of the crushed rockfill that will be used, subject to the acceptance of the Contract Administrator.

E15.4.5 The testing frequency necessary to confirm the material quality will be specified at the discretion of the Contract Administrator.

E15.5 Construction Methods

E15.5.1 Excavation

(a) The rockfill column shafts shall be excavated by drill rig augers to the depth necessary to achieve 1.0 m penetration into dense till. Note that the dense glacial till contact elevation may vary and the depth of excavation may differ from that shown on the Drawings. Note also that the extent of existing riprap may vary from the visible extent shown on the Drawings, and may be present below the existing grade, particularly on the southern row of rockfill columns (row D).

(b) Excavated material shall be removed from the riverbank upon excavation and disposed of off-site.

(c) Any deleterious or sloughed material shall be removed from the rockfill column shaft prior to backfilling.

(d) The construction for the rockfill columns shall be a continuous operation with backfilling immediately following excavation.

(e) The Contractor must complete backfilling of each rockfill column before commencing to excavate adjacent rockfill columns.

E15.5.2 Erosion and Sediment Control

(a) Discharge of water contained in the rockfill columns from displacement of the crushed rockfill during backfilling will be acceptable. The Contractor shall be responsible to contain and direct any displaced water such that it will not affect other construction work or cause erosion of the native riverbank soils or introduce sediment laden water directly into the river.

E15.5.3 Surface Sleevings

(a) The Contractor shall install surface sleevings in each rockfill column shaft sufficient to provide fall protection.

(b) The surface sleevings shall be installed prior to drilling shafts deeper than 2 metres.

- (c) There shall be no separate measurement or payment for surface sleeving.

E15.5.4 Deep Sleeving

- (a) The Contractor shall install additional sleeving as required to control sloughing and caving of the shafts.
- (b) The Contractor shall only be paid for deep sleeving required to advance and maintain an open hole during the excavating, backfilling and compacting procedures, as approved by the Contract Administrator.

E15.5.5 Backfilling and Densification

- (a) Densification of crushed rockfill shall be achieved using vibratory densification equipment capable of penetrating the entire depth of the crushed rockfill in the rockfill column shaft.
- (b) Compacting the crushed rockfill with drill augers, free fall of a weight or a backhoe bucket shall not be accepted.
- (c) The densification method shall achieve a relative increase in density of 15% after initial placement of the crushed rockfill, as determined by measuring the vertical drop in crushed rockfill after densification.
- (d) The Contractor shall demonstrate that the methods and means of compacting the rockfill is suitable to achieve the specified relative increase in density of 15% on three production columns at the commencement of compaction and a minimum of one column daily until the completion of compaction.

E15.5.6 Supply of Crushed Rockfill

- (a) The Contractor shall monitor the supply rate of crushed rockfill to ensure that the backfilling and compacting operations are not delayed.
- (b) Rockfill column shafts shall not be left open for any unnecessary lengths of time.

E15.5.7 Stockpiling of Crushed Rockfill

- (a) Stockpiling of rockfill material will not be permitted on the riverbank except on top of backfilled rockfill columns as approved by the Contract Administrator.

E15.5.8 Contaminated Crushed Rockfill

- (a) Where crushed rockfill becomes contaminated during construction of the rockfill columns, the Contractor shall promptly advise the Contract Administrator. The Contract Administrator will advise the Contractor.
 - (i) Whether the affected crushed rockfill must be removed and disposed of or may remain in place.
 - (ii) Whether the crushed rockfill to be disposed of may be directly hauled to an approved disposal location or whether the material to be disposed of must be weighed prior to disposal.
- (b) Where crushed rockfill has become contaminated due to the Contractor's method of operation, negligence, failure to backfill in a timely manner, etc. the material shall be rejected and shall be weighed prior to disposal for deduction from the total weight of crushed limestone measured for payment.

E15.5.9 Clay Cap

- (a) The rockfill columns shall be sealed with a clay cap as shown on the Drawings.
- (b) The thickness of clay cap shall be measured below final grade following riverbank grading or the working platform elevation, whichever is lower.
- (c) The clay cap material shall be placed within the rockfill column shaft and compacted by mechanical means to eliminate any voids in the clay cap.

E15.6 Measurement and Payment

E15.6.1 Drilling 2.1 m Diameter Rockfill Column Shafts

- (a) Drilling 2.1 m diameter rockfill column shafts shall be measured and paid for on a vertical length basis. The length to be paid shall be the total length in vertical metres (v.m) of "Drill Rockfill Column Shafts," completed in accordance with this Specification as measured below the working platform elevation shown on the Drawings and accepted by the Contract Administrator.

E15.6.2 Deep Sleeving Rockfill Column Shafts

- (a) Deep sleeving shall be measured and paid for on a vertical length basis. The length to be paid shall be the total length in vertical metres of "Deep Sleeving Rockfill Columns Shafts", completed in accordance with this Specification as measured below the working platform elevation shown on the Drawings and accepted by the Contract Administrator.
- (b) The Contractor shall not be paid for sleeving above the working platform elevation shown on the Drawings.
- (c) The Contractor shall not be paid for additional excavation to auger oversized shafts to install the sleeving. Such additional excavation shall be incidental to the cost for sleeving.
- (d) The Contractor shall not be paid for installing over-sized sleeving or installing more than one size of sleeving in a shaft.
- (e) In cases where more than one size of sleeving is installed in a shaft the length of sleeving shall be measured as the total length of shaft sleeved not the total length of sleeve(s) used.
- (f) Vibratory withdrawal of deep sleeving may be used as a means to compact rockfill columns, where the sleeving extends through the entire depth of the column. Where sleeving is used for this purpose, but is not required to control sloughing and caving of the shafts, the cost of sleeving shall be considered incidental to the cost for "Supply, Place and Compact Crushed Rockfill for Rockfill Columns".

E15.6.3 Supply, Place and Compact Crushed Rockfill for Rockfill Columns

- (a) Crushed rockfill for the rockfill columns shall be measured and paid for on a weight basis. The weight to be paid shall be the total weight in tonnes of "Supply and Compact Crushed Rockfill for Rockfill Columns" supplied and placed in accordance with this Specification, measured by truck weight scale tickets as accepted by the Contract Administrator.
- (b) No separate measurement shall be made of the compacted clay cap installed. Placing and compacting the clay cap shall be incidental to the work described in this Specification.
- (c) Crushed rockfill or other imported materials required to maintain working surfaces on Site shall not be included in the weight for payment.

E16. RIVERBANK GRADING

E16.1 Description

E16.1.1 This Specification shall cover the grading of the riverbank to the final grades shown on the Drawings.

E16.1.2 The work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for an incidental to the satisfactory performance and completion of all work hereinafter specified.

E16.1.3 Materials

- (a) Suitable fill required to raise grades as part of Riverbank Grading shall consist of high plasticity clay material with a liquid limit in excess of 50%. The clay shall be free of

deleterious material such as roots, organic material, ice, snow or other unsuitable materials, and may be salvaged from the on-site excavation, as approved by the Contract Administrator. Frozen material will not be accepted.

E16.2 Construction Methods

E16.2.1 Riverbank Grading

- (a) Riverbank grading will be understood to mean excavation or backfilling (including compaction) so that the riverbank geometry is at finished grade, ready for site restoration works or temporary erosion control products.
- (b) Riverbank grading will be understood to extend from the river to the back of the proposed south curb on Lyndale Drive such that grading required for the asphalt sidewalk subgrade and riverbank trail subgrade is included in Riverbank Grading.
- (c) Grade riverbank as shown on the Drawings or as directed by the Contract Administrator. Benching of existing ground shall be considered incidental to the Work.
- (d) Place and compact suitable backfill material as approved by the Contract Administrator to meet the final grade requirements.
- (e) Re-compact any uncompacted backfill soils used for reshaping of the riverbank as part of removal of temporary access ramp(s) and working platform.
- (f) Compact backfill materials to a minimum of 95% Standard Proctor Maximum Dry Density.
- (g) Unsuitable fill material encountered shall be disposed of in accordance with CW 1130 and considered incidental to the Work.

E16.3 Measurement and Payment

E16.3.1 Riverbank grading will be measured and paid for on an area basis. The area to be paid for shall be the total number of square metres of "Riverbank Grading", completed in accordance with this Specification, as measured in the field and accepted by the Contract Administrator.

- (a) The area measured and paid for "Riverbank Grading" shall be the horizontal area measured in plan view.
- (b) Unsuitable site material disposed of shall be considered incidental to "Riverbank Grading".

E16.3.2 Imported fill material necessary for regrading works will be measured and paid for in accordance with CW 3110. Cross-sectional surveys taken following clearing and grubbing, structural removals and associated excavation, and following re-compaction of the access ramp and working platform areas are considered existing conditions from which net fill quantities are calculated as measured by a survey of the finished grade.

- (a) If the Contractor excavates beyond the limit of excavation shown on the Drawings during wall demolition, the additional imported fill material required will not be measured or paid for.

E17. STRUCTURAL REMOVALS

E17.1 Description

- (a) This Specification shall cover all operations relating to the removal and disposal of miscellaneous existing timber pile wall components, as specified herein and as shown on the Drawings. This Specification shall cover structural removal Works, including all necessary staging, excavation, demolition, removal, salvaging, transporting, unloading, stockpiling, dismantlement, and disposal of applicable materials.
- (b) The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools,

supplies, and all things necessary for and incidental to the satisfactory performance and completion of all Works as hereinafter specified.

E17.2 Scope of Work

- (a) The Work under this Specification shall include the following items, to the limits as shown on the Drawings or as otherwise directed by the Contract Administrator:
 - (i) Removing and disposing of the timber handrail post and steel pipe railing;
 - (ii) Removing and disposing of the timber stairs and asphalt ramp;
 - (iii) Removing and disposing of the timber piled retaining wall and lagging;
 - (iv) Removing and disposing of brick facing;
 - (v) Removing and disposing of concrete pile cap;
 - (vi) Removing and salvaging of galvanized steel handrail;
 - (vii) Removing and disposing of steel H-piles and timber lagging;
 - (viii) Excavation of all materials required for the structural removals.
- (b) All structural removal materials not identified for salvage shall revert to the Contractor for off-site disposal. All unsuitable and surplus excavated material shall revert to the Contractor for off-site disposal.

E17.3 Submittals

- (a) The Contractor shall submit to the Contract Administrator for review and approval, at least ten (10) Business Days prior to the commencement of any scheduled Work on the Site, a proposed schedule, including methods and sequence of operations.
- (b) The Contractor shall submit to the Contract Administrator for review and approval, at least ten (10) Business Days prior to the commencement of any Work on Site, a detailed plan and schedule, clearly illustrating the method and sequence by which he proposes to perform the structural removals, including a description of the measures that will be implemented to meet the environmental requirements

E17.4 Materials

E17.4.1 General

- (a) All materials supplied under this Specification shall be of a type approved by the Contract Administrator, and shall be subject to inspection and testing by the Contract Administrator.
- (b) The Contractor shall be responsible for the supply, safe storage and handling of all materials as set forth in this Specification. All materials shall be handled in a careful and workmanlike manner, to the satisfaction of the Contract Administrator.

E17.4.2 Excavations

- (a) Excavated material shall be unclassified excavation and shall include the excavation and satisfactory disposal of all cleared and grubbed materials, surplus concrete pavement, asphalt pavement, earth, gravel, sandstone, loose detached rock, shale, rubbish, cemented gravel or hard pan, disintegrated stone, rock in ledge or mass formation wet or dry, trees, shrubs, or all other material of whatever character which may be encountered.
- (b) All excavated materials 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 Owner for any materials taken by the Contract Administrator for testing purposes

E17.5 Equipment

E17.5.1 General

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

E17.6 Construction Methods

E17.6.1 General

- (a) The Contractor shall prevent movement, settlement, or damage of existing structures to remain, services, paving, trees, landscaping and adjacent grades. The Contractor shall provide bracing, shoring and underpinning as required and shall have this Work certified by a Professional Engineer registered to practice in the Province of Manitoba employed by the Contractor. If the safety of the structure and/or existing structures or services appears to be endangered during structural removal operations, the Contractor shall cease operations and notify the Contract Administrator immediately.
- (b) The Contractor shall provide flagmen, guards, barricades, railings, and necessary warning lights, and whenever necessary, warning signs and lights at the excavations, temporary sidewalks, removals, and/or other construction, to secure the safety of workmen and the public. The safety precautions shall comply with all Provincial Statutes applicable to the Work. The Contractor shall provide all other protective measures as may be required by any law in force in Manitoba and the Canada Labour Code.
- (c) The Contractor shall be fully responsible for ensuring the public safety in all areas, and will be held responsible for any loss or damage caused due to neglect by the Contractor or his employees.
- (d) Under no circumstances shall the Contractor close any portion of existing roadways or walkways to traffic without prior written approval of the Contract Administrator. If any existing roadway is to be closed to traffic in no case shall the Contractor commence any construction operations until such time as all the signs, barricades, and flashers have been erected to the satisfaction of the Contract Administrator.
- (e) Remove timber, steel, concrete and other removal items with appropriate equipment satisfactory to the Contract Administrator. No demolition products are to find their way into the watercourse. The Contractor shall take all necessary precautions to ensure that material do not fall onto any roadways or sidewalks during removal operations.
- (f) In no case will the Contractor be permitted to use removal equipment, or other equipment or methods which may cause damage to any remaining structural elements or to any new construction. In the event that any element is damaged, the Contractor shall repair such element at his own expense to the satisfaction of the Contract Administrator.
- (g) The Contractor shall only use methods of concrete removal that will not damage the existing structure to remain or new structures.
- (h) Provide sawcuts as shown on the Drawings and as herein specified and where otherwise necessary to limit the extent of demolition.
- (i) The Contractor shall only use methods of steel removal that will not damage the existing structure to remain or new structures.
- (j) Repair any over demolition and reinforcing damage to the satisfaction of the Contract Administrator.

E17.6.2 Details of Existing Structure

- (a) The applicable details and structure dimensions of the existing structures are shown on the Drawings for information only in establishing the methods and limits of Work.
- (b) The information shown has been obtained from existing Drawings, measurements, and observations of the Site. The accuracy of this information is not guaranteed and the Contractor must verify all information before commencing Work.

E17.6.3 Sequence of Structural Removals

- (a) Construction sequencing of all structural removals shall take place as shown on the Drawings.

E17.6.4 Removal of Timber Handrail

- (a) Remove and dispose of the timber handrail post and steel pipe railing.
- E17.6.5 Removal of Timber Stairs
 - (a) The timber stairs including asphalt, timber, granular backfill and chain link fencing, shall be completely removed to existing ground level by means as approved by the Contract Administrator. Remove material from the Site.
- E17.6.6 Removal of Timber Piled Retaining Wall and Lagging
 - (a) Remove and dispose of timber piles to the depths and limits of removals, as specified on the Drawings.
 - (b) Remove and dispose of all timber lagging.
 - (c) This shall also include the cutting of the pile.
- E17.6.7 Removal of Brick Facing
 - (a) Remove and dispose of brick facing to the depths and limits of removals, as specified on the Drawings.
 - (b) Remove and dispose of horizontal and vertical strapping supporting the brick facing.
 - (c) This shall include the removal, salvage and reinstallation of brick corner block cut to fit.
- E17.6.8 Removal of Concrete Pile Cap
 - (a) Remove and dispose of concrete pile cap to the depths and limits of removals, as specified on the Drawings.
 - (b) Removals shall be undertaken using hydraulic hammering, or by other means, as approved by the Contract Administrator.
- E17.6.9 Removal of Galvanized Steel Handrail
 - (a) Carefully remove and salvage the existing galvanized steel handrail, as shown on the Drawings.
 - (b) The salvaged galvanized steel hand rail shall be delivered to the City Bridge Yard, and unloaded and stockpiled. Contact Mike Terleski, C.E.T., at 204.794.8510 to arrange suitable delivery time.
- E17.6.10 Removal of Steel H-Piles and Timber Lagging
 - (a) Remove and dispose of steel H-piles by pulling the entire length from the ground, or by other means or limits, as approved by the Contract Administrator.
 - (b) Remove and dispose of all timber lagging.
- E17.6.11 Waste Handling and Disposal of Removed Materials
 - (a) Wherever practical, the Contractor shall recycle disposed materials.
 - (b) The Contractor shall submit a list of locations of disposal/recycling for all removed materials to the Contract Administrator.
 - (c) The Contractor shall promptly haul all removed materials indicated for disposal, off and away from the site. No storage of any materials on-site will be allowed without written approval from the Contract Administrator. It shall be the Contractor's responsibility to find suitable disposal areas away from the site.
- E17.6.12 Excavation
 - (a) Prior to commencing any excavation Works, underground clearances shall be obtained from all applicable utilities by the Contractor. Due care and caution shall be taken by the Contractor to work around all identified underground utilities.
 - (b) The excavations shall be made in a manner such that all miscellaneous timber pile wall components may be properly removed to the required depths and as shown on the Drawings.

- (c) Excavations shall be completed to the limits shown on the Drawings or to such other elevations as may be directed by the Contract Administrator in the field. Excavation sequence shall be done in a “top down” direction, in order to maintain stability.
- (d) All material shall be brought to the surface by approved method, and shall be deposited on the river bank slope if deemed suitable material or disposed of away from the Site if deemed unsuitable material.

E17.7 Quality Control

E17.7.1 Inspection

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

E17.7.2 Access

- (a) The Contractor shall allow the Contract Administrator free access to all parts of the Work at all times. The Contractor shall supply samples to the Contract Administrator or his inspector for testing purposes as required. There will be no charge to the City for samples taken.

E17.8 Measurement and Payment

E17.8.1 Structural Removals

- (a) Structural removals will not be measured and will be paid for at the Contract Lump Sum Price for “Structural Removals”, which price shall be payment in full in full for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E17.8.2 Excavation

- (a) Excavation shall be considered incidental to Structural Removals requiring excavation, and no separate measurement or payment shall be made for this Work.

E18. STOCKPILING OF MATERIALS

E18.1 Description

- E18.1.1 This Specification covers the procedures for establishing and maintaining stockpiles of crushed rockfill and other materials handled on-site.
- E18.1.2 The Work to be done under this Specification shall include the furnishing of all superintendence, overhead labour, materials equipment, tool, supplies and all other things necessary for and incidental to the satisfactory performance and completion of all Work hereinafter specified.

E18.2 Construction Methods

- E18.2.1 The rate at which materials are delivered to the Site shall be controlled to minimize stockpiling and handling.
- E18.2.2 The Contractor shall review stockpile locations with the Contract Administrator prior to establishing stockpiles of material.
- E18.2.3 No stockpiling of materials shall be permitted at the top of the riverbank, along streets or on private properties, unless otherwise approved by the Contract Administrator.

- E18.2.4 The maximum size of stock pile shall be 100 tonnes of material on the working platform until a sufficient number of rockfill columns have been installed and larger stock piles can be established above completed rockfill columns without adversely affecting riverbank stability as determined by the Contract Administrator.
- E18.2.5 No stockpiles shall remain on the working platform overnight unless placed on top of backfilled columns.
- E18.2.6 Stockpiled material shall be handled and maintained in a manner that prevents contamination with other soils and materials, debris, snow or excess moisture. Contaminated material shall be removed and replaced at the Contractor's expense.
- E18.2.7 Stockpiles shall be maintained to prevent release of fine grain sediments into the river.
- E18.3 Measurement and Payment
- E18.3.1 No separate measurement or payment shall be made for stockpiling of materials.

E19. EROSION CONTROL BLANKET

E19.1 Description

- E19.1.1 This Specification shall cover supply and installation of erosion control blankets on exposed soils on the working platform and access ramp, and other areas disturbed during construction.
- E19.1.2 The Work to be done 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 hereinafter specified.

E19.2 Materials

E19.2.1 Erosion Control Blanket (ECB)

- (a) Erosion control blanket shall be machine produced 100% coconut fibre matrix with a functional longevity of up to 12 to 36 months.
- (b) The blanket shall be of consistent thickness with the coconut fibres evenly distributed over the entire area at a minimum of $0.27 \pm$ kg of coconut fibre/m².
- (c) Biodegradable reinforcement netting on both sides manufactured from heavy weight cotton or jute fibre thread. (1.47 kg/100m of thread). The mesh dimension shall be a 16 x 16 mm sewn together on 38 mm centres.
- (d) Approved products are:
 - (i) Erosion Control Blanket C32BD;
 - (ii) North American Green C125BN
- (e) The Contractor shall submit all manufacturers' product specifications and recommended installation methods for the proposed erosion control blankets.

E19.3 Construction Methods

E19.3.1 Erosion Control Blanket (ECB) shall be installed over exposed unvegetated areas of the riverbank following completion of temporary access removal on the riverbank. The ECB shall be installed prior to rising river levels in the spring, following riverbank stabilization.

E19.3.2 ECB Installation

- (a) The Contractor shall follow the manufacturer's recommended installation procedure, as well as the following requirements.
- (b) Roll blanket out in direction of water flow.
- (c) Securely fasten blanket against soil surface with a staggered staple pattern as per the manufacturer's recommendations and as accepted by the Contract Administrator.

- (d) At blanket edges overlap upstream blanket over downstream blanket by a minimum of 150 mm and secure overlaps with a double row of staples, staggered 100 mm (maximum) apart.
- (e) Install a double row of staples staggered at 100 mm apart and 100 mm on centre over the entire width blanketed area at 10 m intervals.
- (f) The upstream edge of the blanket shall be secured in a 150 mm deep by 150 mm wide trench and anchored with staples at a maximum of 300 cm spacing. The trench shall be backfilled with compacted clay.

E19.3.3 ECB Maintenance

- (a) The areas covered with ECB shall be regularly inspected, and in particular after severe rainfall, or flooding events to check for blanket separation or breakage until the end of the warranty period or until vegetation growth has been established.
- (b) Any damage or poorly performing areas shall be replaced/repared immediately. Regrading of the slope by manual labour methods may be required in the event of rill or gully erosion.

E19.4 Measurement and Payment

E19.4.1 Erosion Control Blanket

- (a) Erosion Control Blanket and related Work specified herein will be measured on an area basis and paid for at the Contract Unit Price for "Supply and Install Erosion Control Blanket", completed in accordance with this Specification, and as accepted by the Contract Administrator.
- (b) Areas requiring replacement as directed by the Contract Administrator will be re-measured and additionally paid for at the Contract Unit Price for the Work item. The Contractor shall be compensated for replacing ECB only if the damage occurred as a result of conditions beyond their control, such as severe run-off, or from ice or floating debris. The Contractor shall not be compensated for replacing or repairing ECB damaged as a result of faulty materials, installation methods, or the Contractor's own operations.

E20. INSTALLATION OF SILT FENCE

E20.1 Description

E20.1.1 This specification covers the erection of temporary silt fencing, which shall be installed and maintained at the locations shown on the Drawings to control runoff and minimize the release of detrimental silt loading to watercourses.

E20.1.2 The Scope of the work included in this specification is as follows:

- (a) Supply and Install temporary silt fencing at the locations as indicated on the Drawings, prior to undertaking any other activities on the Site where silt fencing is required.
- (b) Maintain the silt fencing in serviceable condition throughout the entire duration of activities at the Site where silt fencing is required, including final restoration and clean-up of the construction Site.
- (c) Remove the silt fencing and restore the area where the fencing was installed, without further disturbing the area and without releasing any deleterious substances to the adjacent watercourse.

E20.2 Materials

E20.2.1 Fence Posts

- (a) Fence posts shall be 100 mm diameter untreated wood posts or 50 mm diameter steel.

E20.2.2 Filter Fabric

- (a) Filter Fabric shall be woven geotextile material specifically designed for a silt fence application, meeting the following minimum requirements:

Property	Test Method	Value
Grab Tensile Strength	ASTM D 4632	0.55 kN
Grab Tensile Elongation	ASTM D 4632	15%
Mullen Burst	ASTM D 4786	2060 kPa
Puncture	ASTM D 4833	0285 kN

Property	Test Method	Value
Trapezoid Tear	ASTM D 4533	0285 kN
UV Resistance	ASTM D 435	580%@500 hrs.
Apparent Opening Size	ASTM D 4751	0.60 mm
Flow Rate	ASTM D 4491	405 L/min/m ²

Acceptable Product: "Amoco 2130 Silt Fence Fabric" or approved equal in accordance with B7.

E20.2.3 Wire Mesh

- (a) Wire mesh shall be galvanized or plain metal with wire gauge = 3.0 mm, wire spacing @ 150 mm o/c.

E20.2.4 Fencing Material Fasteners

- (a) Staples or wire ties of sufficient strength and spacing to withstand 500 N (100 lbf) pull test at any point on the wire mesh.

E20.3 Construction Methods

E20.3.1 Ensure that no deleterious substances are discharged into the adjacent watercourse at any time during construction activities.

E20.3.2 Silt Fence Installation

- (a) Excavate 150 x 150 anchor trench along alignment of silt fence as indicated. Note that riprap may be present in areas of anchor trench installation.
- (b) Ensure that fence posts are firmly driven into undisturbed soil, or are completely and firmly backfilled if installed via auger methods. Attach wire mesh as support backing for silt fence filter fabric with fasteners. Attach silt fence filter fabric on top of wire mesh in similar fashion. Overlap any fence seams (wire mesh or filter fabric) by 450 mm minimum. Ensure that wire mesh and filter fabric are installed on the upslope side of the post and are fully laid in anchor trench as shown
- (c) Install and compact impermeable excavated materials into anchor trench and slope as indicated. Compact to 95% of maximum dry density (ASTM D-698).

E20.3.3 Silt Fence Maintenance

- (a) Inspect silt fence daily, prior to starting any other construction activities. If fence posts are found loose or not upright, repair in accordance with installation procedure as specified. If silt fence is found to be loose or torn, repair or replace as necessary to comply with this Specification.
- (b) If silt deposition at the fence is 300 mm or more in depth, carefully remove and dispose of silt offsite without disturbing silt fence.

E20.3.4 Silt Fence Removal

- (a) The silt fence shall remain in place until the erosion control blanket has been installed, as determined by the Contract Administrator, and shall be removed prior to rising river levels in the spring.
- (b) Upon authorization of the Contract Administrator, remove all fence posts, wire mesh, fabric, and fasteners from Site.
- (c) Restore area disturbed without releasing any deleterious substances to the adjacent watercourse.

E20.4 Measurement and Payment

- E20.4.1 The supply, placement, and removal of silt fence shall be measured on a length basis and paid for at the Contract Unit Price per lineal metre for "Silt Fence". The length to be paid for shall be the total number of metres supplied and placed in accordance with this Specification, accepted and measured by the Contract Administrator. Payment of silt fence shall be in accordance with the following payment Schedule:
 - (a) Sixty percent (60%) of the Contract Unit Price per lineal metre for "Silt Fence" shall be paid following supply and installation.
 - (b) Forty percent (40%) of the Contract Unit Price per lineal metre for "Silt Fence" shall be paid following final removal.
- E20.4.2 Removal of accumulated sediment from the silt fence is considered incidental to the Work and no separate measurement or payment will be made.

E21. EROSION AND SEDIMENT CONTROL

- E21.1 This Specification covers the supply, implementation and maintenance of erosion control measures during construction and not specifically covered in E16 to control the release of sediments into the river during and following construction.
- E21.2 The Work to be done 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 hereinafter specified.
- E21.3 Materials
 - E21.3.1 The Contractor shall maintain a supply of erosion control products such as erosion control blankets, silt fencing, straw bales or mulch on Site at all times suitable for trapping and preventing sediments from entering the river during construction.
- E21.4 Construction Methods
 - E21.4.1 Construction
 - (a) The Contractor shall plan and carry out all his Work in a manner that will mitigate the potential for the release of sediments into the river.
 - (b) Sediment control measure shall be implemented to meet the requirements of Fisheries and Oceans Canada.
 - (c) The Contractor shall monitor his Work and implement appropriate sediment control measures as Site conditions warrant. Such measures may include installation of silt fences, straw bales or other measure as required in the event that there is runoff from the Site due to thawing or rain.
 - (d) Upon completion of the construction Work, all surplus or waste materials, and materials containing fine-grained sediments shall be removed from the Site.
- E21.5 Measurement and Payment
 - E21.5.1 No separate measurement or payment shall be made for erosion control measures supplied, installed and maintained under this specification. This Work shall be incidental to the Contract.

E22. RIPRAP

E22.1 Description

E22.1.1 These Specifications govern all operations necessary for and pertaining to the supplying and placing of approved riprap as a protective covering along the side slopes and bases of river channels, or such other places as may be indicated on the plans or designated by the Contract Administrator in the field.

E22.1.2 This specification shall amend and supplement Specification No. CW 3615.

E22.2 Submittals

E22.2.1 The Contractor shall submit the proposed supplier(s) and location of quarry sites at least ten (10) business days prior to the supply of riprap to the Site, to confirm that sufficient quantity of specified rock is available.

E22.2.2 The Contractor shall supply representative test results at least ten (10) business days prior to the supply of riprap to the Site, demonstrating that the material to be supplied is of adequate quality and gradation to satisfy the material specifications contained herein.

E22.3 Materials

- (a) The material used for the riprap shall be 450 mm down quarried rock manufactured from sound durable limestone or dolomite meeting the following properties:
 - (i) minimum bulk specific gravity of 2.6 (ASTM C127),
 - (ii) maximum Los Angeles abrasion loss of 32% (ASTM C131),
 - (iii) maximum soundness loss of 13% (ASTM C88)
 - (iv) maximum absorption of 2.5% (ASTM C127),
 - (v) gradation requirements, as follows:
- (b) The riprap shall be well graded having a full range and even distribution of sizes and shall conform to the following gradation:

GRADATION REQUIREMENTS FOR RIPRAP

Diameter (mm)	Percent Passing by dry weight
450	100%
300	40-70%
100	25-50%
5	0-5%

- (c) Individual particles shall be shaped such that no dimension is greater than four times the smallest dimension. Flat, elongated, or platy particle shapes will not be accepted.
- (d) The diameter shall be taken as the average of the shortest and longest dimension measured on an individual piece of riprap.
- (e) Riprap shall be free from sod, roots, organic material and debris prior to placement. Individual pieces of riprap shall be free of defects such as seams or cracks that would cause rapid or excessive deterioration or degradation.
- (f) Contractors supplying riprap shall be responsible for demonstrating that the material is of adequate quality, gradation, and volume to meet the material specifications contained herein.
- (g) All materials set forth in this Specification shall be subject to inspection and testing by the Contract Administrator or by the testing laboratory designated by the Contract Administrator.

- (h) The Contract Administrator will visit proposed quarry Sites for inspection of the proposed riprap material and quarry faces a minimum of fourteen (14) days prior to supply and placement of riprap.
- (i) No supply and placement of riprap will be permitted prior to the Contract Administrator approving the source.
- (j) The testing frequency necessary to confirm the material quality will be specified at the discretion of the Contract Administrator.

E22.4 Construction Methods

- E22.4.1 The riprap shall be dumped or placed in such a manner that the larger particles are uniformly distributed, the smaller particles serve to fill the spaces between the larger particles, and that excessive segregation of the various particle sizes does not occur. Sufficient placing and leveling shall be done to produce a firmly bedded neat and uniform surface conforming to the thickness, shape, and dimensions shown on the plans.
- E22.4.2 The riprap shall be placed to the grades and lines shown on the Drawings.
- E22.4.3 The Contractor is advised that it may be necessary to break ice to place the riprap to the dimensions shown on the drawings. In this case, the Contractor shall obtain a Frozen Waterway Permit to undertake the work. The permit is available through the City of Winnipeg Zoning and Permits Office at 204-986-5140. In particular, vehicular traffic on the ice surface is prohibited without this permit. The Contractor is required to supply and install the appropriate safety fences and signage for open water and thin ice conditions.
- E22.4.4 The winter river level shown on the drawings is based on typical conditions. The Contractor is advised that these levels can vary above and below the level indicated.

E22.5 Measurement and Payment

- E22.5.1 Supply and placement of riprap will be measured on a weight basis. Riprap will be paid at the contract unit price per tonne for "Supply and Place Riprap" for the total number of tonnes measured by truck weight scale tickets as accepted by the Contract Administrator.
- E22.5.2 The Contractor is to supply all truck weight scale tickets to the Contract Administrator by the end of each work day.
- E22.5.3 Sub-excavation and disposal of excavated soil, shaping the riprap bed, supplying, loading, hauling, and placing stone riprap shall be considered incidental to the Work.

E23. EXTERIOR SITE CARPENTRY

E23.1 Description

- E23.1.1 Provide labour, materials, methods, equipment and accessories for the fabrication and installation of wood bench on gabion wall and wood rail fence (light-proof barrier/fence (SCD-629)) at the east end of the project area.

E23.2 References

- E23.2.1 American Wood-Preservers' Association (AWPA)
 - (a) AWPA M2, Standard for Inspection of Treated Wood Products.
 - (b) AWPA M4, Standard for the Care of Preservative-Treated Wood Products
- E23.2.2 American Society for Testing and Materials International, (ASTM)
 - (a) ASTM A53/A53M, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - (b) ASTM A269, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
 - (c) ASTM Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

- E23.2.3 Canadian Standards Association (CSA International)
- (a) CSA B111, Wire Nails, Spikes and Staples
 - (b) CSA O141 Softwood Lumber
 - (c) CSA O80, Wood Preservation
 - (d) CSA O80.20, fire-retardant treatment of lumber by pressure processes
 - (e) CSA 086-09 Engineering in wood construction
 - (f) CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel
 - (g) CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles
 - (h) CAN/CSA-S16.1, Limit States Design of Steel Structures.
- E23.3 Materials
- E23.3.1 Pressure Treated Lumber
- (a) Material: to be pressure treated wood, no. 1 grade, colour: green, moisture content 19% or less in accordance with following standards: CAN/CSA-O141; NLGA Standard Grading Rules for Canadian Lumber; Forest Stewardship Council (FSC) certified.
 - (b) Preservative for above ground use: to CSA-O80 Series, ACQ-C treatment, clear finish. Minimum net retention: 4.0 kg/m³.
 - (c) Preservative for ground contact: to CSA-O80 Series, ACQ-C treatment, clear finish. Minimum net retention: 6.4 kg/m³.
- E23.3.2 Hardware
- (a) Deck screws, nails and spikes: to CSA O86-09., coated and suitable for ACQ treated lumber. Size to suit application.
 - (b) Threaded rods, bolts nuts, washers, lag screws to be hot dipped galvanized, sizes to suit application.
 - (c) Lag screws: hot dipped, galvanized, sizes to suit application.
- E23.4 Quality Assurance
- E23.4.1 Carpentry shall be performed by trained and qualified craftspeople with demonstrable experience sourcing and work.
- E23.4.2 Conduct a pre-installation meeting with the Contract Administrator to verify requirements.
- E23.4.3 Lumber Identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- E23.4.4 For products treated with preservative by pressure impregnation, submit following information certified by authorized signing officer of treatment plant:
- E23.4.5 Information listed in AWPA.M2 and revisions specified in CAN/CSA-080 Series, Supplementary Requirement to AWPA Standard M2 applicable to specified treatment.
- E23.4.6 Moisture content after drying following treatment with water-borne preservative.
- E23.4.7 All wood to be free of defects. Any warped, checked or bent materials will be rejected.
- E23.5 Construction Method
- E23.5.1 Handle and use treated and non-treated wood in a manner which will avoid damage or field fabrication causing alteration in original treatment.
- E23.5.2 Re-treat pressure treated wood surfaces exposed by cutting, trimming or boring with liberal brush application of clear preservative and fire retardant before installation. Ensure that damaged areas such as abrasions, nail and spike holes, area thoroughly saturated with field treatment solutions as per CSA-O80 and CSA-O80.20

- E23.5.3 Construct all work as indicated on the Drawings using adequate fastening methods to ensure solid durable finished work suitable for the purpose intended.
- E23.5.4 Do all nailing and fastening neatly, evenly and thoroughly.
- E23.5.5 Frame anchor, fasten, tie and brace members to provide necessary strength and rigidity. Install all members true to line, levels and elevations.
- E23.5.6 Set plumb and space uniformly. Countersink bolts where necessary to provide clearance for other work.
- E23.6 Measurement and Payment
- E23.6.1 Supply and construction of wood bench tops will not be measured. This item of work shall be considered incidental to the cost of "Seating Alcoves", performed in accordance with this Specification and accepted by the Contract Administrator.
- E23.6.2 Supply and construction of wood rail fence will be measured on a length basis. This item of work will be paid for at the Contract Unit Price per linear metre for "Wood Rail Fence", performed in accordance with this Specification and measured and accepted by the Contract Administrator.

E24. PLANTING MEDIUM & FINISHED GRADING

E24.1 Description

- E24.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of planting medium in tree pits and bank revegetation areas.

E24.2 References

- E24.2.1 Agriculture and Agri-Food Canada
- .1 The Canadian System of Soil Classification, Third Edition, 1998.
- E24.2.2 Canadian Council of Ministers of the Environment (CCME) Guidelines.
- E24.2.3 The City of Winnipeg Standard Construction Specifications
- .1 CW 1130 – Site Requirements
 - .2 CW 3540 – Topsoil and Finish Grading for Establishment of Turf Areas

E24.3 Submittals

- E24.3.1 Submit 0.5kg sample of topsoil to National Testing Laboratory, or approved alternate, and indicate present use and intended use. Prepare and ship sample in accordance with Provincial regulations and testing laboratory requirements.
- E24.3.2 Submit two (2) copies of soil analysis and recommendations for corrections to Contract Administrator.

E24.4 Quality Assurance

- E24.4.1 Inform Contract Administrator of proposed source of materials to be supplied and provide a sample for review by Contract Administrator prior to installation.
- E24.4.2 Testing of planting medium to be carried out and paid for by Contractor. Prepare and ship planting medium samples to approved laboratory in accordance with Provincial regulations and laboratory requirements, indicating intended use on each sample.
- E24.4.3 Test planting medium for nutrients N, P, K, micronutrients, soluble salt content, pH value and OM (organic matter).
- E24.4.4 Acceptance of planting medium is subject to an inspection of material and confirmation of test results. Do not commence soft landscaping work until Contract Administrator has accepted planting medium.

E24.5 Delivery, Storage and Handling

- E24.5.1 Store materials in a dry area, protected from freezing, sedimentation and contamination.
- E24.5.2 Deliver and store fertilizer in waterproof bags labeled with weight, analysis and name of manufacturer.

E24.6 Materials

- E24.6.1 Planting Medium: In accordance with CW 3540 for topsoil except organic matter to be in the range of 5-10%.
- E24.6.2 Peatmoss: deliver from partially decomposed fibrous or cellular stems and leaves of species of sphagnum mosses. Elastic and homogeneous, brown in colour. Free of wood and deleterious material that could prohibit growth. Shredded particle minimum size: 5 mm.
- E24.6.3 Sand: hard fine silica sand, well washed and free of impurities, chemical or organic matter. Coarse texture, and to the following gradation:

Particle Size (mm)	% Passing through Screen
2.0	100%
1.0	95 to 100%
0.5	80 to 100%
0.25	0 to 30%
0.15	0 to 8%
0.075	0 to 1%

- E24.6.4 Fertilizer: Synthetic start-up slow release fertilizer with a N-P-K analysis of 12-36-15 ratio at a rate of 4 kg per 100 m² which is 8 pounds per 100 sq ft.

E24.7 Construction Method

E24.7.1 Subsoil Preparation

- (a) Prior to placing topsoil in revegetation areas, scarify subsoil across the slope to a depth of 75 mm.

E24.7.2 Planting Medium Placement

- (a) Obtain approval of tree vault excavation, subsoil scarification and rough grading of revegetation areas prior to placing planting medium.
- (b) Place planting medium in uniform layers over unfrozen sub-grade, to the depth indicated on the Drawings.
- (c) Eliminate rough spots and low areas, Prepare a loose, friable bed, boot firm and level.

E24.7.3 Soil Amendments

- (a) Apply lime, sulphur, or other soil amendment at a rate determined and recommended from planting medium sample test.
- (b) Mix soil amendment well into full depth topsoil prior to application of fertilizer.

E24.7.4 Finished Grading

- (a) Per CW3540.
- (b) Fine grade entire soil area to elevations as indicated on the drawings. Eliminate rough spots and low areas Leave surfaces smooth, uniform and firm against foot printing with a fine loose texture.

E24.8 Surplus Material

- E24.8.1 Dispose of unused planting medium off Site in accordance with CW1130.

E24.9 Cleaning

E24.9.1 Perform cleaning to remove accumulated environmental dirt from all paved surfaces of building faces. Remove surplus materials, rubbish, tools and equipment barriers.

E24.10 Measurement and Payment

E24.10.1 Supply and placement of planting medium in tree wells will not be measured. This item of Work shall be considered incidental to the cost of "Supply and Installation of Trees" performed in accordance with this Specification and accepted by the Contract Administrator.

E24.10.2 Supply and placement of planting medium in revegetation areas shall be measured on an area basis. Planting medium will be paid for at the Contract Unit Price per square metre for "Supply and Place Planting Medium in Revegetation Areas" for the total number of square metres measured and accepted by the Contract Administrator.

(a) The area measured and paid for "Supply and Place Planting Medium in Revegetation Areas" shall be the horizontal area measured in plan view

E24.10.3 Finish grading and disposal of excess material shall be considered incidental to the Work.

E25. TREES, SHRUBS & GROUNDCOVER PLANTINGS

E25.1 Description

E25.1.1 Provide all labour, materials, methods, equipment and accessories for the supply and installation of trees.

E25.2 References

E25.2.1 Agriculture and and Agri-Food Canada (AAFC)

(a) Plant Hardiness Zones in Canada-2000.

E25.2.2 Canadian Nursery Landscape Association (CNLA)

(a) Plant Canadian Standards for Nursery Stock-2001.

E25.2.3 Department of Justice Canada (JUS)

(a) Plant Canadian Environmental Protection Act (CEPA), 1999, c. 33.

(b) Transport of Dangerous Goods Act (TDGA), 1992, c.34.

E25.2.4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)

(a) Materials Safety Data Sheets (MSDS).

E25.3 Submittals

E25.3.1 Submit product data for:

(a) Fertilizer.

E25.4 Source Quality Control

E25.4.1 Obtain approval from Contract Administrator of plant material at source.

E25.4.2 Notify Contract Administrator of source of material at least seven (7) days in advance of shipment. No work under this Section is to proceed without approval.

E25.4.3 Acceptance of plant material at source does not prevent rejection on Site prior to or after planting operations.

E25.4.4 Plant material imported from other nations will not be accepted.

E25.4.5 Bare root plant material will not be accepted.

E25.5 Storage and Protection

- E25.5.1 Coordinate the shipping of plants and excavation of holes to ensure minimum time laps between digging and planting.
- E25.5.2 Protect plant material from frost, excessive heat, wind and sun during delivery.
- E25.5.3 Protect plant material from damage during transportation:
- (a) When delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
 - (b) When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
 - (c) Protect foliage and rootballs using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- E25.5.4 Protect stored plant material from frost, wind and sun as follows:
- (a) For bare root plant material, preserve moisture around roots by heeling-in or burying roots in topsoil and watering to full depth of root zone.
 - (b) For pots and containers, maintain moisture level in containers.
 - (c) For balled and burlapped and wire basket rootballs, place to protect branches from damage. Maintain moisture level in root zones.
- E25.5.5 Remove broken and damaged roots with sharp pruning shears. Make clean cut and cover cuts over 20mm (3/4") diameter with wound dressing.
- E25.5.6 Keep roots moist and protect from sun and wind. Heel-in trees that cannot be planted immediately in shaded areas and water well.
- E25.6 Scheduling
- E25.6.1 Order plant material as soon as possible after award of contract to ensure plant availability. Request substitutes as required.
- E25.6.2 Provide Contract Administrator a written schedule fourteen (14) days in advance of shipment of plant material. Schedule to include: quantity and type of plant material, shipping dates, arrival dates on Site, and planting dates.
- E25.7 Warranty of Nursery Stock
- E25.7.1 For all plant material a warranty period of two (2) calendar years is required.
- E25.7.2 During the warranty period, upon written notification from the Contract Administrator, the Contractor warrants to replace and replant any nursery stock found dead and/or in poor condition as soon as possible thereafter, 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 City.
- E25.7.3 End-of-Warranty inspection will be conducted by Contract Administrator.
- E25.7.4 Contact Administrator reserves the right to extend Contractor's warranty responsibilities for an additional one (1) year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.
- E25.8 Replacements
- E25.8.1 During warranty period, remove from Site any plant material that has died or failed to grow satisfactorily as determined by the Contract Administrator.
- E25.8.2 Extend warranty on replacement plant material for a period equal to the original warranty period.

- E25.8.3 All required replacements shall be by plants of at least the same size and species as specified, and shall be supplied and planted in accordance with the original Drawings and Specifications.
- E25.8.4 Should the replaced plant material not survive, the Contractor will be responsible to replace it a third time and guarantee it for a period equal to the original warranty period unless it is determined that unique Site conditions or inadequate maintenance causes the death of plants
- E25.9 Plant Material
- E25.9.1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
- E25.9.2 Source of plant material: grown in Zone 3 only in accordance with Plant Hardiness Zones in Canada.
- E25.9.3 Plant material must be planted in zone indicated as appropriate for its species.
- E25.9.4 Plant material free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.
- E25.9.5 Substitutions to plant material as indicated on planting plan are not permitted unless written approval has been obtained as to type, variety and size. Plant substitutions must be of similar species and of equal size as those originally specified.
- E25.9.6 Refer to Plant Specification List on the Drawings and the Drawings for species, quantities, size and quality of plant materials.
- E25.10 Water
- E25.10.1 Water free of impurities that would hinder plant growth. The Contractor shall provide water, so that all costs to provide water for the watering operation and all associated costs shall be borne by the Contractor. These costs may include hydrant permit and meter rental fees.
- E25.10.2 Further to clause 3.7 of CW 1120, the Contractor shall pay for all costs associated with obtaining water in accordance with the Waterworks By-law. Sewer charges will not be assessed for water obtained from a hydrant.
- E25.11 Planting Medium: as per E24.
- E25.12 Tree Tie: biodegradable or polyethylene fabric strapping min. 3bmm wide.
- E25.13 Tree Protection: Plastic, 13 mm ϕ , nylon reinforced garden hose over guy wire.
- E25.14 Fertilizer: synthetic start-up slow release fertilizer with a N-P-K analysis of 12-36-15 ratio at a rate of 4 kg per 100 m² which is 8 pounds per 100 sq ft.
- E25.15 Pre-Planting Preparation
- E25.15.1 Obtain approval from Contract Administrator of finish grading, and planting medium installation prior to commencing Work in this section.
- E25.15.2 Ensure plant material is acceptable to the Contract Administrator.
- E25.15.3 Remove damaged roots and branches from plant material with sharp clean equipment treating wounds as necessary to maintain plant health.
- E25.15.4 Apply anti-desiccant to deciduous trees in leaf in accordance with manufacturer's instructions.
- E25.16 Planting Layout
- E25.16.1 For individual trees:

- (a) Stake out locations of all trees and obtain approval from Consultant prior to excavating tree pits.
- (b) Excavate tree pits to depths and widths indicated on the Drawings with a back hoe unless other methods are indicated or approved.
- (c) Remove rocks, roots, debris and toxic material from the tree pit.
- (d) Scarify sides of planting hole.

E25.16.2 Remove water which enters excavations or planting beds prior to planting. Notify Contract Administrator if water source is groundwater.

E25.17 Planting

E25.17.1 For jute burlap rootballs, cut away top one third of wrapping and wire basket without damaging rootball. Do not pull burlap or rope from under rootball.

E25.17.2 For container stock or rootballs in non-degradable wrapping, remove entire container or wrapping without damaging rootball. Loosen rootball to encourage bonding with planting medium and subgrade.

E25.17.3 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.

E25.17.4 For trees and shrubs:

- (a) Backfill soil in 150 mm (6") lifts. Tamp each lift to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade.
- (b) Form watering saucer as indicated on the Drawings.

E25.17.5 Water plant material thoroughly. Report persistent ponding in planting areas to the Contract Administrator immediately.

E25.17.6 After soil settlement has occurred, fill with soil to finish grade.

E25.17.7 Dispose of burlap, wire and container material off Site.

E25.18 Tree Supports

E25.18.1 Install tree supports as indicated on the Drawings taking care not to damage or puncture underground utilities.

E25.18.2 Use double stake tree support for deciduous trees:

- (a) Place first stake on prevailing wind side of tree trunk.
- (b) Drive stakes minimum 150mm into undisturbed soil beneath bottom of roots. Ensure stakes are secure, vertical and unsplit.
- (c) Install tree tie 1500mm above grade.

E25.19 Pruning

E25.19.1 Undertake corrective pruning after planting to eliminate torn and broken branches. Do not damage lead branches or remove smaller twigs along main branches. Do not prune to compensate for root loss.

E25.20 Maintenance

E25.21 Maintain plant material from date of planting to the end of the warranty period. Refer to Landscape Maintenance Specification.

E25.22 Measurement and Payment

E25.22.1 Supply and installation of trees will be measured on a unit basis and will be paid for at the Contract Unit Price per unit for the following items of work, measured as specified herein,

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

Items of Work:

- (a) Manitoba Maple
- (b) American Elm
- (c) Basswood
- (d) Cottonwood (male)
- (e) Peachleaf Willow

E26. LANDSCAPE MAINTENANCE

E26.1 Description

E26.1.1 Provide all labour, materials, methods, equipment and accessories for the maintenance of trees following acceptance of the plant material to start warranty.

E26.1.2 In general, the Work shall include:

- (a) Fertilizing
- (b) Watering
- (c) Weed Control
- (d) Pest and disease Control
- (e) Winter Preparation

E26.1.3 Maintenance shall be performed on an as required basis.

E26.2 Maintenance and Warranty Period

E26.2.1 Maintenance shall occur between the date of installation and up to a period of two (2) years from date landscaped areas are accepted to start warranty. The warranty period for plant materials will be coincidental to the maintenance period.

E26.2.2 Thirty days after the planting installation has been completed, the Contract Administrator shall perform an inspection of the plant material to determine if the plant material is acceptable to start warranty.

E26.3 Materials and Equipment

E26.3.1 Materials shall conform to the requirements of related Specification sections.

E26.3.2 Provide all equipment to properly execute Work. Maintain such equipment in a workable, safe condition while in use during this project.

E26.3.3 Contract Administrator shall review equipment to be used to execute Work prior to execution.

E26.4 Method

E26.4.1 General

- (a) Provide watering service within 24 hours, weeding services within 48 hours of the request by the Contract Administrator. Monitor the Site and advise the Contract Administrator of conditions that might void the Contractor's warranty responsibilities.
- (b) The Contractor shall maintain a log noting times, dates, equipment used, and quantity of materials used and areas treated for each maintenance application. Forms shall be provided by Contract Administrator. Submit log to Contract Administrator upon request. Contractor shall notify Contract Administrator of the exact time Contractor proposes to commence each application.

- (c) Schedule operations in accordance with growth, health, weather conditions, and use of Site.
- (d) Perform each operation continuously and completely within a reasonable time period.
- (e) Store equipment and materials off Site.
- (f) Collect and dispose of debris or excess material on the day the maintenance is undertaken.

E26.4.2 Maintenance of Trees:

- (a) Fertilizing: Apply fertilizer only at frequency, ratio and rates as recommended by manufacturer. Water immediately after fertilizing. Apply fertilizer no later than May 30th of each maintenance year.
- (b) Watering: Apply water as required to supplement rainfall and to maintain optimum growing conditions. In general, water once a week to achieve rates as indicated. Allow soil to adequately dry between watering to prevent over saturation without creating water stress. Subject to the above-noted requirements, the Contractor must water at least once a week between May 1st and October 15th inclusive. A complete record is to be kept of each series of waterings for all planted trees noting location and date of watering. This record is to be given to the Contract Administrator when requested. Apply 40 litres of water per 25 mm calliper per application using a deep root feeder or low pressure open flow nozzle and hose. The water stream must not gouge the soil and mulch.
- (c) Weed Control: Inspect and undertake weed control weekly during the first year of maintenance and monthly during the second year. By hand, remove all weeds with their roots from tree pits and tree beds and dispose of off Site. When weeding operation is complete, replace and rake displaced mulch to its original condition.
- (d) Pests and Diseases: Obtain written approval of Contract Administrator prior to using any pesticide. Control pests and disease through pruning or application of pesticides. Use species specific pesticides where possible. Use only pesticides of low mammalian toxicity. Strictly follow manufacturer's written instructions.
- (e) Pruning: The Contractor shall provide a person with a Manitoba Arborists Certificate for each work crew or Work Site. Prune as required to remove dead, broken or damaged limbs. Prune back to healthy growth while maintaining balanced crown shape. Employ clean sharp tools. Make cuts smooth and flush with outer edge of branch collar near the main stem or branch. Cuts must be smooth and sloping to prevent accumulation of water on cut. Do not leave little stumps ("horns") on trunks or main branches. Prune according to accepted horticultural practices as outline in "The Pruning Manual", Publication No. 1505-1977 by Agriculture Canada.
- (f) Winter Preparation: Ensure adequate moisture in tree root zones prior to freeze-up.

E26.5 Measurement and Payment

E26.5.1 Landscape maintenance shall be paid for on a lump sum basis for the items of work listed below. Price shall be payment in full for supplying all material and performing all operations herein described and all other items incidental to the Work included in this Specification.

Items of Work:

- (i) Landscape Maintenance Year 1
- (ii) Landscape Maintenance Year 2

E27. CONCRETE CURB AND GUTTER

DESCRIPTION

E27.1 This Specification shall supplement and amend CW 3240-R10 – "Renewal of Existing Curbs".

CONSTRUCTION METHODS

E27.2 Concrete Curb and Gutter

- E27.2.1 The Contractor shall utilize slip-form paving methods wherever possible, as determined by the Contract Administrator.
- E27.2.2 The Contractor shall fill the area between the existing pavement and the proposed curb and gutter below the proposed asphalt overlay required for slip-form paving equipment with concrete.

MEASUREMENT AND PAYMENT

E27.3 Concrete Curb and Gutter

- E27.3.1 There shall be no separate measurement or payment for the work described in this Specification. Payment shall be included in the price paid for "Curb and Gutter".

E28. LIMESTONE TOPPING MATERIAL

DESCRIPTION

- E28.1 This Specification shall cover the supply and placement of 6 mm down limestone material for use on sidewalks and trails. This Specification shall supplement CW 3110.

MATERIALS

- E28.2 The Contractor shall supply a well-graded 6 mm down limestone material consisting of durable, crushed limestone.

CONSTRUCTION METHOD

- E28.3 The Contractor shall supply, place and compact the 6 mm down limestone material in accordance with CW 3110, Base Course.

MEASUREMENT AND PAYMENT

- E28.4 6 mm down limestone material shall be measured on a weight basis and paid at the Contract Unit Price, in tonnes, for "Supplying and Placing 6 mm Down Limestone Topping Material" which price shall be payment in full for the supply of all materials and for performing all operations required to complete the work as specified.

E29. REMOVAL OF EXISTING PIPES

DESCRIPTION

- E29.1 This Specification shall amend and supplement Specification CW 2130 and CW 3210.

CONSTRUCTION METHODS

- E29.2 Removal of existing pipes shall consist of existing catch basin or curb inlet leads which are to be removed in order to facilitate the installation of new catch basins or catchpits.

MEASUREMENT AND PAYMENT

- E29.3 The removal of existing pipes by excavating, removing and disposing of existing pipe will be measured on a length basis. The length to be paid for shall be the total number of linear metres of pipe removed from the specified area measured horizontally at grade. Removal of existing pipes will be paid for at the Contract Unit Price for "Removal of Existing Pipes", which price shall be payment in full for the supply of all materials and for performing all operations required to complete the work as specified.

E30. LIMESTONE QUARRY BLOCKS

E30.1 Description

E30.1.1 Provide labour, materials, methods, equipment and accessories for the supply and installation of limestone quarry block terraces.

E30.2 References

E30.2.1 American Society for Testing and Materials International, (ASTM)
(a) ASTM C568-03 – Standard Specification for Limestone Dimension Stone.

E30.3 Submittals

E30.3.1 Submit one (1) Type 'F' Block as called up on the Drawings as a sample for approval. Sample shall be typical of grade, colour and finish specified. Approved sample shall be reference standard for terrace, and may be incorporated into the Work.

E30.4 Source Quality Control

E30.4.1 Obtain approval of selected limestone sedimentary planes as source. When proposed source has been approved, use no other source without written authorization.

E30.5 Materials

E30.5.1 Limestone Quarry Blocks: To ASTM C568-03, category II, high density sound hard stone, free of clay pockets. Colour: grey-white to yellow white. Finish: split and rustic faces as indicated on Drawings. Acceptable supplier: Mariash Quarry. Box 425 279 Vincent Road, Stony Mountain, Manitoba R0C 3A0, phone: 204.344.5115, or approved alternate. Stone sizes as indicated on Drawings.

E30.5.2 Levelling Course shall consist of limestone topping material in accordance with E28.

E30.5.3 Bedding Course shall consist of 150 mm crushed limestone subbase in accordance with CW 3110.

E30.6 Construction Method

E30.6.1 Subgrade: Ensure subgrade preparation conforms to compaction requirements and levels required for installation of granular.

E30.6.2 Bedding Course: Place bedding material to compacted thickness as indicated. Spread and compact bedding material in uniform layers not exceeding 150mm compacted thickness. Compact each layer to 100% Standard Proctor Density.

E30.6.3 Levelling Course: Place levelling course as required to achieve a neat, level surface prior to placement of limestone blocks, no more than 75 mm thick.

E30.6.4 Layout: Mark proposed block layout and obtain approval from Contract Administrator.

E30.6.5 Limestone: Set cut face of limestone blocks directly on prepared levelling course base. Ensure blocks are approximately level and plumb and with top at required elevation. Butt split faces tightly together where indicated.

E30.6.6 Fill any gaps between blocks greater than 12 mm with levelling course material to CW 3110.

E30.7 Measurement and Payment

E30.7.1 Limestone quarry blocks and related work specified herein shall be measured and paid for on a weight basis. The weight to be paid shall be the total weight in tonnes of "Supply and Installation of Limestone Quarry Block Terrace" supplied and placed in accordance with this Specification, measured by truck weigh scale tickets as accepted by the Contract Administrator.

E31. WIRE MESH GABIONS

E31.1 Description

E31.1.1 Work consists of furnishing, assembling and installing rock filled wire mesh gabion baskets.

E31.2 References

E31.2.1 American Society for Testing and Materials International, (ASTM)

(a) ASTM A975-97 - Double-Twisted Hexagonal Mesh Gabions and Revet Mattresses

(b) ASTM A 641 – Galvanized Annealed Wire

E31.3 Submittals

E31.3.1 Submit one gabion basket fill rock sample for approval. Samples shall be typical of grade, colour and finish specified. Approved sample may be incorporated into the Work.

E31.3.2 Submit sample of rock fill for approval. Size of sample shall be adequate to judge suitability for intended purpose. Sample shall be of typical size, colour and materials specified. Approved sample shall be reference standard for the rock fill material, and may be incorporated into the Work

E31.3.3 Submit samples minimum of 2 weeks prior to commencing work.

E31.4 Source Quality Control

E31.4.1 Prior to delivery to the site, inform the Contract Administrator in writing of gabion fill rock source, and obtain approval.

E31.5 Materials

E31.5.1 Gabion baskets: Gabions shall be fabricated, assembled and installed in accordance with ASTM A975. Acceptable product: Maccaferri galvanized and PVC coated woven wire type baskets, or approved alternate. Sizes as indicated on the Drawings, fabricated within a dimension tolerance of plus or minus 5%.

E31.5.2 Wire: Wire for fabrication and assembly shall be hot-dipped galvanized and PVC coated. The wire shall have a minimum tensile strength of 75,000 psi, and a thickness of 2.7 mm internal and 3.7 mm external. Galvanized steel wire shall conform to ASTM A 641, Class 3, Soft Temper. PVC coating thickness: Nominal – 0.5 mm, Minimum –0.38 mm.

E31.5.3 Binders: Spiral binders are the standard fastener for welded-mesh gabion baskets and mattresses, and shall be formed from wire meeting the same quality and coating thickness requirements as specified for the gabion baskets and mattresses.

E31.5.4 Spenax Fasteners: Stainless steel overlapping ring fasteners used to complement lacing wire. Alternate fasteners for use with wire mesh gabions, such as ring fasteners, shall be formed from wire meeting the same quality and coating thickness requirements as specified for the gabions.

E31.5.5 Rock: Hard, unbroken round washed field stone. Min. 85%, by weight, shall be between 100 and 200 mm in diameter, with a maximum diameter of 250 mm, and a minimum diameter of 90 mm.

E31.5.6 Bedding and Base Course Materials: Bedding and base course materials shall conform to the requirements of CW 3110-R19, Sub-Grade, Sub-Base and Base Course Construction.

E31.5.7 Geotextile: Geotextile shall conform to requirements of CW 3130, Supply and Installation of Geotextile Fabrics.

E31.5.8 Wood: SPF lumber, ACQ pressure treated, colour green.

E31.6 Construction Method

E31.6.1 Layout: Mark proposed gabion layout and obtain approval from Contract Administrator.

- E31.6.2 Subgrade: Foundation on which the gabions are to be placed shall be cut or filled and graded to lines and grades indicated, in accordance with CW 3110. Surface irregularities, loose material, vegetation, and foreign matter shall be removed from foundations. Gabions and bedding or specified geotextiles shall not be placed until foundation preparation is completed, and sub-grade surfaces have been reviewed and accepted by Contract Administrator.
- E31.6.3 Place and compact sub-base and base course materials in accordance with CW 3110.
- E31.6.4 Geotextile: Geotextile shall be installed in accordance with requirements of CW 3130, Supply and Installation of Geotextile Fabrics.
- E31.6.5 Gabion basket assembly: Rotate gabion panels into position and join vertical edges with fasteners for gabion assembly. Where lacing wire is used, wrap wire with alternating single and double half-hitches at intervals between 100 – 125 mm. At corners and exterior joints supplement lacing wire with Spenax fasteners 100 mm spacing. Use lacing wire to install interior diaphragms.
- E31.6.6 Mesh cutting and folding: Where shown on the Drawings, the gabions shall be cut, folded and fastened together. The mesh must be cleanly cut and surplus mesh either folded back or overlapped so that it can be securely fastened together with lacing wire or fasteners in the manner described above.. Any reshaped gabions shall be assembled, installed, filled and closed as specified in the previous sections.
- E31.6.7 Diaphragms: Interior partitions (diaphragms) will be installed to assure that no open intervals are present that exceed 1000 mm.
- E31.6.8 Gabion basket placement: Place empty gabions on foundation and interconnect adjacent gabions along top, bottom, and vertical edges using lacing wire or ring fasteners. Wrap wire with alternating single and double half-hitches at intervals between 100 – 150 mm. Ring fasteners shall not be spaced more than 150 mm apart.
- E31.6.9 After adjacent empty woven wire gabion units are set to line and grade and common sides properly connected, they shall be placed in straight line tension and stretched to remove any kinks from mesh and to gain a uniform alignment. Temporary support of gabions may be done to maintain established proper alignment prior to placement of rock. No stakes shall be placed.
- E31.6.10 Internal connecting cross-tie wires shall be placed in each unrestrained gabion cell greater than 450 mm in height, including gabion cells left temporarily unrestrained. Two internal connecting wires shall be placed concurrently with rock placement, at each 300 mm interval of depth. These cross-ties will be placed evenly spaced along front face and connecting to back face. Cross-tie wires shall be looped around two mesh openings and each wire end shall be secured by minimum of five 180 degree twists around itself after looping.
- E31.6.11 Rock Fill: Gabions shall be carefully filled with rock, either by machine or hand methods, maintaining alignment, avoiding bulges, and providing a compact mass that minimizes voids. Machine placement will require supplementing with handwork. Cells in any row shall be filled in stages so that depth of rock placed cells does not exceed depth of rock in adjoining cell by more than 300 mm. Along exposed faces, outer layer of stone shall be carefully placed and arranged by hand to ensure a neat, compact placement with a uniform appearance.
- E31.6.12 Bench Rail Installation: Wood bench rails shall be installed inside the gabion baskets (under the lid) as indicated on the Drawings. Level rails by hand placing rocks under and around bolt extensions. Pack rocks tightly around bolts and under rails to provide firm base for bench.
- E31.6.13 Last layer of rock shall be uniformly overfilled 25 – 50 mm to allow for rock settlement. Lids shall be stretched tight over the rock fill using only approved lid closing tools. Use of crowbars or other single point leverage bars for lid closing is prohibited. Lid shall be stretched until it meets perimeter edges of front and end panels. Gabion lid shall then be secured to sides, ends, and diaphragms with lacing wire wrapped with alternating single

and double half-hitches in mesh openings. Ring fasteners spaced not more than 150 mm apart may be used for lid closure.

E31.6.14 Damage to wire or coatings during assembly, placement and filling shall be repaired promptly in accordance with manufacturer's recommendations or replaced with undamaged gabion baskets.

E31.7 Measurement and Payment

E31.7.1 Supply and construction of rock filled wire mesh gabions will not be measured. This item of work will be paid for under the Contract Lump Sum price for "Seating Alcoves", performed in accordance with this Specification and accepted by the Contract Administrator